FARMERS PRIDE INTERNATIONAL

FPI Online Academy | Implementation manual | 2026

FPI ABC Integrated Model

Unifying rural production with global bio-industrial markets through a high-performance network of technology, logistics, and shared expertise.



Climate-smart agriculture training involving women farmers in Nyando, Kenya, 2013. Photo V. Atakos / CCAFS. Source and licence: pp. 197–199.

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Author

FARMERS • COMMUNITIES • GOVERNMENTS • YOUTH LEADERS
DIGITAL SCHOOLS • ESG INVESTORS • GLOBAL BUYERS • BIO-PROCESSORS

Farmers Pride International

A subsidiary of Hunter's Global Network

200 pages | Principles Procedures Cases Field tools

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This 200-page edition includes the front and back covers, 24 teaching chapters, 12 constructed case studies, 24 reusable tools, a glossary, references and photograph credits. The editable Word file and reader PDF contain the same manual. Pagination refers to this edition and includes covers.

The model is presented as an FPI implementation framework. It is not a claim that every described service, facility, partnership, certification or market is already operating. Site assessments, technical validation, permissions and commercial agreements must establish what can be implemented in a particular location.

Financial examples use USD and are explicitly illustrative. They are teaching calculations rather than market prices, loan offers, guaranteed yields or investment returns. The examples do not use a per-tree moringa yield as verified evidence.

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Apply and review

Version control: the publisher should maintain an approved master, a change log and a technical review schedule before issuing revised public editions.

Application notes

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Purpose and practical promise

The FPI ABC Integrated Model connects rural production to markets through coordinated enterprises, shared services and accountable decisions. The central task is to make a complete chain work: an identified product, capable producers, suitable processing, reliable logistics, credible buyers and payment that sustains participation.

This manual explains how farmers, communities, governments, youth leaders, digital schools, ESG investors, global buyers and bio-processors contribute to that chain. It moves from market discovery and cluster design through production, learning, technology, quality, finance and staged implementation. Its purpose is practical coordination rather than the promotion of acreage or equipment for its own sake.

The model uses the FPI programme context of RUAIPP, the Rural and Urban Agriculture Innovative Production Program. Agriculture Based Clusters organize implementation, while Agriculture Systems Integration connects the operating functions. Teams should preserve these distinctions when assigning authority and communicating externally.

The operating promise is disciplined collaboration: start with an evidenced need, establish the conditions required to meet it, test at manageable scale and improve using records. Commercial results depend on circumstances and execution. A responsible model preserves the ability to pause or redesign when evidence does not support expansion.

Apply and review

Before reading further, identify the product or service you hope to develop and the stakeholder group you represent. Keep that example beside you throughout the manual.

Application notes

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How to use the manual

Read Chapters 1 to 3 to establish the common model. Then use the chapters relevant to your role, while retaining the connections to other functions. Every teaching page combines a focused explanation, operating checks and an application task. Working space supports discussion and site-specific decisions; it should be completed using real evidence rather than copied assumptions.

Farmers can begin with Chapters 4, 10 and 11. Community representatives can use Chapter 5 and the inclusion reviews. Government teams can begin with Chapter 6. Youth and learning teams should use Chapters 7 and 8. Operators need Chapters 9 to 16 and 20 to 22. Investors and finance teams should examine Chapters 17 and 18 alongside operational evidence. Managers can use Chapters 23 and 24 to coordinate implementation.

The cases on pages 153 to 164 are constructed teaching scenarios, not reported FPI results. Their answer guidance explains reasoning and limitations. The tools on pages 165 to 188 provide reusable decision and record structures. Adapt them to local law, product requirements, participant needs and available resources.

Source identifiers such as [S03] point to the reference section. External sources provide background frameworks and authoritative entry points. The practical procedures, exercises and examples are the manual's implementation guidance. Verify applicable current requirements with responsible authorities and qualified practitioners before consequential decisions.

Apply and review

For a team workshop, assign one chapter, one case and one tool to each function. Reconvene to resolve responsibilities and dependencies rather than discussing each topic in isolation.

Application notes

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The integrated operating model

The physical chain moves material from producers to aggregation, transformation and markets. Buyer requirements travel back towards production. Data, money and accountability connect every transfer. Technology, logistics and shared expertise support the entire route; they are not separate projects whose success can be measured independently of reliable delivery.

Use the map to identify a missing link. A strong production block cannot compensate for absent processing, while a modern facility cannot create demand. The first implementation task is to select a manageable product route and assign responsibility for the full transaction.



Figure 1. Operating relationships proposed by the FPI ABC Integrated Model. Diagram is instructional, not evidence of an existing facility or contract.

Apply the model

Annotate the map for your proposed cluster. Mark current capability, planned capability and externally controlled decisions. Use different labels rather than presenting every box as an existing operation.

Application notes

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Eight groups one coordinated chain

Each group has a distinct contribution and an evidence obligation. Participation should improve decisions without making authority ambiguous. Commercial commitments, community consultation, technical release and public permissions require their own responsible decision makers.

Stakeholder	Contribution	First useful output
Farmers	Produce and preserve field evidence	Product-specific readiness and harvest plan
Communities	Shape access legitimacy and local benefits	Engagement record and grievance route
Governments	Provide rules public services and enabling conditions	Permissions and institutional map
Youth leaders	Organize enterprise and accountable participation	Service pilot with paying-customer evidence
Digital schools	Build and assess practical competence	Accessible lesson and assessment plan
ESG investors	Assess responsible capital and risk	Evidence-based investment and action review
Global buyers	Specify evaluate and purchase products	Current specification and commercial terms
Bio-processors	Transform material and control manufacturing	Verified process capacity and release evidence

Ask each group to name one dependency on another group. Resolve the dependency before setting a joint delivery target.

Application notes

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CHAPTER 01 | 1 OF 6

Understanding the integrated model



Climate-smart agriculture training involving women farmers in Nyando, Kenya, 2013. Photo V. Atakos / CCAFS. Source and licence: pp. 197–199.

An Agriculture Based Cluster is a coordinated arrangement through which producers and service providers meet an identified market requirement. Physical proximity can help, but a cluster becomes useful when participants agree what will be produced, how quality will be protected, who will perform each service and how payment will move back to producers.

The FPI ABC Integrated Model in this manual connects rural production to domestic, regional and global bio-industrial markets. Its performance depends on the complete transaction. A harvested crop has little commercial value to the cluster if drying, testing, storage or a credible buyer is missing. Start with one product and a manageable delivery commitment, then build the required capabilities around it.

- Define the product by species, form, grade, quantity and delivery period.
- Identify the responsible person at every transfer of product, information and money.
- Treat new equipment, additional hectares and new members as decisions that require evidence.

Apply and review

Choose one proposed product. Describe the buyer problem it solves and the weakest link that could prevent delivery. Name the person who will investigate that link before planting expands.

Related reference framework: [S01]. See pages 193–196.

Application notes

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Distinguish programme cluster and operating system

RUAIPP is the Rural and Urban Agriculture Innovative Production Program used here as the broader FPI programme context. ABCs provide an organizational route for implementation. Agriculture Systems Integration describes the practical connection of production, processing, markets, finance, logistics and learning. These terms describe different levels of the same work; they should not become competing organizations with overlapping authority.

FPI's four stated ABC pillars can guide the design: spiritual values support integrity and service; physical capability covers land, water and assets; intellectual capability builds knowledge and judgement; technological capability provides appropriate tools and systems. Translate each pillar into observable responsibilities rather than treating it as a slogan.

An individual farm manages field decisions. A cluster coordinates shared requirements. A processing enterprise operates equipment and product controls. A buyer purchases under agreed terms. Combining these roles in one enterprise is possible, but responsibilities still need to be distinguishable. An extension officer should not silently become a loan guarantor, and a training certificate should not be presented as a purchase commitment.

- Programme level: establish purpose, scope, resources and review arrangements.
- Cluster level: coordinate participation, delivery schedules and common services.
- Enterprise level: execute contracts, employ staff and control assets and liabilities.

Apply and review

Draw three boxes for the programme, cluster and operating enterprises. Put every existing committee and manager in a box, then identify any responsibility that has no clear owner.

Application notes

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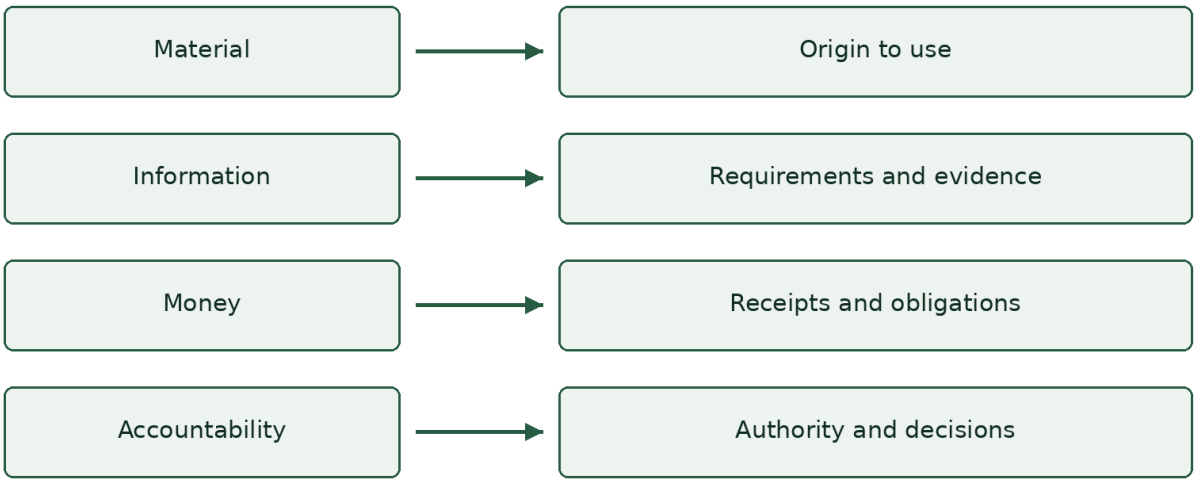
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Follow four connected flows

The model has four flows. Materials move from inputs to farms, collection points, processors and markets. Information moves in both directions: buyers communicate requirements, while farmers and processors provide evidence of capability. Money moves through sales, wages, service fees, supplier payments and reserves. Accountability connects decisions to named people and records.

A problem in one flow often appears first in another. Late payment can cause a farmer to divert supply. Missing lot information can make a physically sound shipment unacceptable. A purchase order can look profitable while the working-capital requirement makes it impossible to fulfil. Reviewing only production quantities hides these relationships.

- Material record: quantity, identity, condition, location and custodian.
- Information record: specification version, source, date and decision affected.
- Money record: amount, currency, due date, recipient and supporting evidence.
- Accountability record: authority, approval, exception and corrective action.



Apply and review

Trace one delivery backwards from buyer receipt to the field. Record where the four flows cease to agree and decide which record must be corrected first.

Application notes

Define high performance in operational terms

High performance means reliable delivery of suitable products while protecting people, resources and financial viability. It is not the largest planted area, fastest machine or most impressive dashboard. Select measures that make operational failure visible early enough to respond.

A balanced cluster review might examine accepted delivery quantity, product rejection, payment timeliness, operating cash, incident closure and water use per unit of saleable output. Each measure needs a definition and a decision owner. A single good result is insufficient: revenue may increase because prices rose, while producer payment worsened and losses increased. Compare several periods and explain the causes.

- Reliability: accepted deliveries divided by deliveries due in the same period.
- Quality: rejected quantity divided by inspected quantity, with reasons retained.
- Liquidity: cash available against payments falling due before the next expected receipt.
- Inclusion: participation, voice and paid opportunities assessed separately.

Apply and review

Select five measures for your cluster. For each, write what action would follow an adverse result and who has authority to take that action.

Application notes

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Establish boundaries before making promises

This publication is an implementation design for FPI stakeholders, not evidence that a particular facility, buyer contract, certification or investment has already been secured. Local teams must distinguish approved activities from proposals. Membership, training, accreditation, organic certification and eligibility to sell are different matters.

Create a boundary statement explaining which products, locations, participants and services are included in the pilot. State what the cluster does not yet provide, such as finance, transport or guaranteed purchases. Make this statement available before collecting fees or enrolling farmers. Record revisions when capabilities change, rather than allowing old promises to circulate indefinitely.

- Current capability: supported by staff, records, service agreements and operating evidence.
- Planned capability: dependent on milestones, funding or external approval.
- External decision: controlled by a regulator, lender, certification body or buyer.

Apply and review

Review your latest brochure or recruitment message. Mark each operational claim as current, planned or externally decided. Replace ambiguous statements and preserve the approved version for future reference.

Application notes

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Build a minimum viable cluster

A minimum viable cluster is a small operating arrangement that can complete a real transaction and learn from it. It needs an identifiable supplier group, a clear product specification, suitable collection and handling, a competent processor or service provider, traceable records and a credible route to payment.

Use a controlled trial order to expose gaps. Record actual handling time, acceptance, transport cost, losses and days to payment. A pilot is successful when it generates trustworthy evidence, even if the evidence shows that expansion should wait. Do not conceal rejected batches or unpaid costs to protect an optimistic business case.

- Before launch: resolve access to land, water, people, services and required permissions.
- During the trial: keep separate costs and lot records so performance can be reconstructed.
- After settlement: reconcile sales, deductions, producer payments and lessons.

Apply and review

Write a one-page pilot charter stating the product, delivery size, start and end dates, spending ceiling and conditions that would pause operations. Obtain named acceptance from the participating functions.

Application notes

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CHAPTER 02 | 1 OF 6

Choosing value chains and verifying demand



Farmers Market Hertford. Documentary market example; see full source and licence in the credits. Source and licence: pp. 197–199.

A value chain is the sequence of activities and relationships that turns biological production into a product someone will buy. Choosing a crop because it grows well is only the beginning. The decision must also consider product use, buyer specification, processing requirements, logistics, competing supply and the producer's ability to finance the cycle.

Develop two or three product options before selecting an anchor crop. Moringa, for example, can lead to different leaf and seed businesses. Their harvesting, equipment, testing and markets are not interchangeable. A market for dried leaves does not establish demand for seed oil. Evaluate each product separately, even when it comes from the same plant.

- Identify the purchased product rather than using the crop name alone.
- Find the processing and compliance steps between harvest and that product.
- Compare expected contribution and cash exposure under conservative assumptions.

Apply and review

Compare three possible products using market access, resource fit, processing capability and cash requirements. Identify any missing condition that should disqualify an option regardless of its score.

Related reference framework: [S01], [S10]. See pages 193–196.

Application notes

Conduct a structured buyer interview

A useful buyer interview asks how a purchasing decision is made. Start with intended use and product form. Then ask about specification, sampling, packaging, minimum shipment, delivery location, acceptance procedure and payment terms. Request a current written specification and confirm who can approve a supplier.

The purpose is to gather evidence, not to persuade the buyer to endorse an untested project. Record which answers are confirmed and which are indicative. An expression of interest is different from a binding order. A sample request may be exploratory and does not justify promising purchase to hundreds of farmers.

- Ask which quality failures most often cause rejection or price deductions.
- Establish whether seasonality, certification scope or country of origin affects eligibility.
- Confirm whether quoted prices include freight, insurance, duties or other costs.

Apply and review

Prepare ten interview questions for one target buyer. Add an evidence column showing the document or contact needed to verify each answer. Do not count an unanswered question as a favourable response.

Application notes

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Segment markets by requirements

Domestic fresh markets, regional processors and international ingredient buyers may value the same crop differently. A nearby retailer might need frequent small deliveries and attractive appearance. An industrial buyer may prioritize identity, consistency and repeatable testing. A food-service customer may need convenient preparation and predictable portion size.

Segment by requirement and transaction cost, not by the belief that export prices are always superior. Export revenue can be reduced by laboratory work, freight, documentation, financing and rejection exposure. A local processor with reliable payment may offer a stronger contribution than a distant buyer with a higher headline price. Compare the same product basis and delivery point.

- Describe each segment's product, acceptance test, volume pattern and payment cycle.
- Distinguish users, importers, agents, distributors and retail channels.
- Retain a commercially credible alternative outlet for suitable off-specification product.

Apply and review

Build a three-segment comparison for your anchor product. State why each segment might accept your supply and what evidence would show that the segment is presently inaccessible.

Application notes

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Score opportunities without hiding fatal gaps

A weighted matrix can make tradeoffs visible. Choose criteria and weights before scoring products. Useful criteria include buyer evidence, production suitability, processing access, transport feasibility, working capital and social or environmental effects. Define the meaning of every score so participants use the scale consistently.

FPI's planning shorthand D + R + P + D draws attention to food-demand growth, growth in per-capita income, population growth and demand elasticity. These describe different relationships and units; they should not be literally added into an output or revenue forecast. Use them to frame market questions, then obtain product- and segment-specific evidence.

Do not allow a high total to compensate for an unresolved legal restriction, unsafe process or lack of water. These are screening gates rather than weighted preferences. Also test whether changing the weights changes the selected product. If small changes reverse the result, the decision needs more evidence rather than a more elaborate spreadsheet.

- Screen mandatory conditions first and record pass, fail or unresolved.
- Score feasible options against observable evidence, not enthusiasm.
- Run a sensitivity check on the two most uncertain criteria.

Apply and review

Allocate 100 weighting points across six criteria. Score two products, explain each score and identify the single additional piece of evidence most likely to change the decision.

Application notes

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Test demand with a staged commercial trial

A commercial trial should progress from specification clarification to sample evaluation, pilot delivery and settlement. Agree in advance what the buyer will test and how results will be communicated. Keep the sample's identity, origin, process and date linked to the proposed supply route.

A hand-selected sample may not represent a normal production batch. Use trial conditions that can be repeated at the intended scale. If a buyer accepts a sample, establish whether acceptance applies only to that sample or to a broader supplier approval. Retain feedback on failed samples; it often identifies the improvement needed before further investment.

- Record sample preparation, shipping, receipt and buyer evaluation.
- Agree how trial lots will be accepted, rejected, returned or disposed of.
- Compare actual settlement against the original price and cost assumptions.

Apply and review

Design a three-stage trial with a spending ceiling at each stage. State the evidence required to proceed, including a rule for stopping after repeated failure or unresponsive buyer feedback.

Application notes

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Avoid dependence on a single commercial story

Concentration risk arises when the cluster depends on one buyer, crop, transport route or processing asset. Diversification should address a specific vulnerability. Adding many crops without processing or marketing capability can increase complexity and losses rather than improve resilience.

Construct a concentration map. Show the share of forecast revenue by buyer and product, and identify services that have no alternative provider. Then investigate realistic alternatives: a second approved buyer, a toll processor, different planting windows or suitable storage. Do not count an unqualified contact as an alternative market.

- Separate confirmed revenue, probable orders and speculative opportunities.
- Assess how long operations could continue if the largest buyer delayed payment.
- Calculate whether a smaller alternative outlet can absorb the affected quantity.

Apply and review

Remove your largest forecast buyer from the plan for one cycle. Recalculate cash and storage needs. Document what must be developed before concentration becomes acceptable to the board and participating producers.

Application notes

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CHAPTER 03 | 1 OF 6

Building the cluster architecture



Pallet-rack warehouse. Documentary storage example; photograph by Axisadman. Source and licence: pp. 197–199.

A cluster hub may provide aggregation, testing, drying, storage, maintenance or learning. It does not need to own every service. Its location should reflect the product's handling window, road access, water, power, labour availability and the cost of moving material from farms.

Define the catchment by travel time and reliable access rather than a neat circle on a map. Wet-season roads, border delays and loading queues can make a nearby farm operationally distant. Visit proposed routes with the intended vehicle and confirm access at different times. A central facility that cannot receive harvest when needed is not an effective hub.

- Map origin points, road constraints and realistic journey times.
- Estimate peak arrivals rather than only average monthly supply.
- Compare a single central site with smaller collection points and contracted services.

Apply and review

Sketch two hub options. For each, calculate the longest collection trip and identify the farmer group most likely to be excluded. Propose a workable access arrangement before choosing the site.

Related reference framework: [S01], [S06]. See pages 193–196.

Application notes

Separate ownership access and control

Ownership identifies who holds an asset or enterprise. Access defines who may use it and under what conditions. Operational control determines who schedules work, authorizes spending and manages safety. These arrangements can differ, but differences must be explicit.

A special purpose vehicle, or SPV, is an entity established for a defined project or activity. Its ownership, governance, contracts and liabilities need professional design under the applicable jurisdiction. Creating an SPV does not itself provide finance, remove operating risks or transfer another party's assets.

A community may own land while an enterprise operates a dryer under a lease. Farmers may own shares while a professional manager controls daily production. Neither arrangement works if shareholders routinely bypass operating rules. Create asset-specific agreements explaining maintenance, insurance, improvements, permitted use, reporting and exit. Take local legal advice before transferring rights or creating security over assets.

- Identify the legal owner, operator and beneficiary of each major asset.
- Specify access rights, booking priority and fees for members and non-members.
- Define what happens to improvements when a lease or partnership ends.

Apply and review

Select one proposed shared asset and write its ownership, access and control arrangements in separate paragraphs. Identify any promise made to members that the asset owner has not accepted.

Application notes

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Allocate roles across the eight stakeholder groups

Farmers produce and retain field evidence. Communities influence access, legitimacy and local benefits. Governments establish public rules and services. Youth leaders organize participation and enterprise opportunities. Digital schools build competence. Investors assess capital and risk. Buyers specify and purchase products. Bio-processors transform material and control manufacturing.

These roles overlap in practice, but a decision should have one accountable owner. Participation does not mean everyone approves every action. A buyer can advise on a specification without controlling community representation. A government officer can clarify regulatory requirements without approving the cluster's commercial forecasts.

- Consult affected groups before choices that change access, livelihoods or responsibilities.
- Give each operating task one owner and a defined escalation route.
- Separate advisory input from authority to commit money or sign agreements.

Apply and review

For product release, producer payment, land access and training assessment, name the accountable owner, contributors and people who must be informed. Resolve any task with several competing owners.

Application notes

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Define shared services as service agreements

Shared expertise becomes operational when participants know what service they receive, when it will occur, its cost and how poor performance is addressed. A verbal promise of technical support cannot replace a schedule, defined scope and records of work performed.

Create a service catalogue covering agronomy, laboratory coordination, machinery, logistics, bookkeeping and training. For each service, identify the provider, eligibility, booking process, response time and evidence of completion. Start with services that remove demonstrated constraints. Subsidized services still have costs; show who pays them and when subsidy support ends.

- Describe the service in terms of a result the user can verify.
- Publish fees, exclusions, cancellation terms and complaint arrangements.
- Monitor utilization and completion rather than only the number of registered users.

Apply and review

Draft a service entry for a farm assessment. Include preparation required from the farmer, deliverable, expected timing, fee basis and the process for challenging an incomplete assessment.

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Resolve bottlenecks before adding volume

A chain's output is constrained by the stage that cannot handle the required work. Extra farm production may simply create a queue at a dryer or packhouse. Measure effective capacity after cleaning, changeovers, maintenance and staffing limitations rather than relying on a supplier's maximum machine rating.

Map daily flow through reception, treatment, processing, testing and dispatch. Convert quantities to a common basis when moisture or yield changes. Identify where material waits, who controls the queue and what losses waiting creates. Improve the bottleneck first, then reassess the rest of the chain because the constraint may move.

- Record observed throughput and downtime for each operation.
- Match harvest windows to processing and storage availability.
- Test whether outsourcing or rescheduling is cheaper than new equipment.

Apply and review

Follow one batch for a full day. Record work time and waiting time separately at every stage. Identify a practical change that reduces the longest wait without shifting an unacceptable risk downstream.

Application notes

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Write a cluster charter people can use

A charter explains why the cluster exists, who may participate and how important decisions are made. It should be short enough to discuss in a member meeting and precise enough to resolve routine disagreement. Detailed contracts and procedures can sit underneath it.

Include purpose, membership conditions, representation, authority, financial transparency, conduct, dispute handling and review. Explain how the charter can change and which rights cannot be changed informally. Translate or explain it in the languages participants use. Ask members to describe its meaning back to the facilitator; a signature alone does not establish understanding.

- State the difference between membership benefits and services charged separately.
- Define meeting notice, quorum and recording arrangements under the chosen legal form.
- Provide an accessible complaint route independent of the person complained about.

Apply and review

Test the charter against a dispute over a drying fee. Can members identify the applicable rule, evidence, decision maker and appeal route? Revise the charter if the answer depends on personal influence.

Application notes

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CHAPTER 04 | 1 OF 6

Farmers and production readiness



Women harvesting vegetables. Documentary production example; see full source and licence in the credits. Source and licence: pp. 197–199.

Farmer onboarding should establish capability, responsibilities and support needs. It is not simply collecting names. Begin with identity, location, authority to use the site, production history, water access, workforce, existing crops and intended market. Explain data use and commercial conditions before asking for consent.

Assess readiness against the particular product. A farmer may be ready for local fresh sales but need major improvements for dried export ingredients. Record deficiencies and agree a corrective plan. Payment for training or assessment must not be described as guaranteed purchase approval. Give the farmer a copy of the assessment and an understandable explanation of the next decision.

- Verify the site and responsible person rather than relying only on remote forms.
- Classify findings as ready, ready with conditions or not yet ready.
- Assign support, deadlines and reassessment arrangements for material gaps.

Apply and review

Complete a mock onboarding interview with a colleague acting as a farmer. Ask them to explain the fees, obligations and purchase conditions in their own words before closing the interview.

Related reference framework: [S08], [S11]. See pages 193–196.

Application notes

Understand the land and its history

A site history helps identify production and contamination risks. Record previous crops, chemical use, flooding, waste disposal, livestock access, neighbouring activities and past disputes. Compare the farmer's account with observations and available records. Uncertainty should remain visible until investigated.

Map boundaries, water sources, access tracks, storage and sensitive areas. Mark areas that should not enter the initial production plan. Land access needs documentary and community verification appropriate to the location. An informal introduction to an owner is not the same as authority to plant a commercial crop or install infrastructure.

- Keep maps dated and distinguish approximate boundaries from surveyed boundaries.
- Use risk-based soil and water assessment directed by competent advisers.
- Record restrictions on land use, buildings, abstraction and access.

Apply and review

Walk a proposed production block and annotate five observations that could affect the marketable product. Explain which observation requires laboratory evidence, which requires legal verification and which can be corrected operationally.

Application notes

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Match planting plans to a verified outlet

A planting plan should work backwards from the required delivery period and accepted product quantity. Allow for establishment time, crop variability, processing recovery, rejection and logistics. Use local trial observations where possible rather than transferring an exceptional yield from another site.

Separate fresh biomass, dry material and saleable grade. Tree density does not determine marketable output on its own. Water, soil, plant survival, harvest regime and drying performance all matter. For moringa and other herbals, measure trial plots and batches before assigning a financial yield to every tree or hectare.

- State whether yield is per harvest or per year and whether it is fresh or dry.
- Allow time for buyer qualification before scheduling commercial expansion.
- Link each production block to collection and processing capacity.

Apply and review

Translate a buyer requirement of 1,000 kg of saleable dry product into a production plan using clearly labelled trial recovery and rejection assumptions. Show where a weak assumption could cause overplanting.

Application notes

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Build practical field records

Field records connect an action to a location, date, input, operator and outcome. Useful records include planting material, field preparation, irrigation, nutrient applications, pest observations, interventions and harvest. The system should be simple enough to maintain during busy periods.

Choose stable field identifiers and retain them when crops change. Record actual actions as they occur; retrospective reconstruction should be identified as such. Supervisors should compare a sample of records with field conditions and input stock. A beautifully completed log that contradicts the site is a control failure.

- Record product names, quantities and units for applied inputs.
- Link harvest containers and delivery lots to their fields of origin.
- Keep corrections readable with a date and responsible person.

Apply and review

Design a weekly field sheet that can be used without internet. Test it with one real irrigation or harvest event and check whether another person can reconstruct what happened from the record alone.

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Turn extension advice into agreed actions

Extension is effective when advice changes a decision and the result can be observed. A field visit should begin with the farmer's question and relevant records, then examine the site. Explain the diagnosis, proposed action, expected outcome and uncertainty in language the farmer understands.

Prioritize a few actions rather than producing an unmanageable list. Distinguish urgent containment from longer improvements. Record what the farmer will do, what the adviser will provide and when results will be reviewed. Where a recommendation needs specialist confirmation, document the referral rather than presenting a guess as a prescription.

- Ask what the farmer has already tried and what resources are available.
- Confirm who will buy materials, provide labour and monitor results.
- Review previous actions before issuing new advice.

Apply and review

Prepare a visit note for poor plant establishment. Include observations, possible causes, immediate actions and evidence needed to distinguish water stress from planting-material or soil problems.

Application notes

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Measure readiness through demonstrated performance

A readiness review should combine documents, observations and a small operating test. Ask the farmer to demonstrate harvest hygiene, lot identification, record completion and delivery preparation. This is more informative than a questionnaire asking whether procedures exist.

Use evidence proportionate to the risk. A minor record omission may be corrected with coaching. Unresolved contamination, unsafe storage or inability to identify the field of origin may require a hold. Give a clear reason for the decision and a realistic route to improvement. Keep assessment separate from personal relationships or pressure to meet enrolment targets.

- Record the evidence observed and the person who assessed it.
- Define which findings block supply and which allow conditional participation.
- Reassess material changes in land, water, crop, workforce or production method.

Apply and review

Design a 30-minute readiness demonstration for your product. Include one deliberate error, such as an unlabelled container, and explain how the assessor should respond without humiliating the participant.

Application notes

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CHAPTER 05 | 1 OF 6

Communities and accountable governance



A farm extension session in Kenya. Documentary example of shared learning; photograph by Samuel Macharia. Source and licence: pp. 197–199.

Community engagement begins before a site, recruitment campaign or investment commitment is treated as settled. Identify people who use the land, water, roads and services, including those who are not formal landowners or cooperative members. Ask how a proposed cluster could change their access, work, income and daily routines.

Use separate discussions where a large public meeting would silence some participants. Explain the project in understandable terms and record concerns, disagreement and unresolved questions. Attendance does not equal consent. A community leader's support does not automatically establish that every affected household has accepted a change.

- Map affected groups and the issues they consider material.
- Distinguish information sharing, consultation and any legally required consent.
- Return with responses showing how concerns influenced the design.

Apply and review

Plan two engagement formats for groups unlikely to speak in a public meeting. State how feedback will reach the decision maker and how participants will learn the outcome.

Related reference framework: [S06], [S11], [S12]. See pages 193–196.

Application notes

Protect land water and livelihood rights

A cluster must understand who holds formal and customary rights before committing to land or water use. Include seasonal access, grazing, collection of natural materials and shared infrastructure. A vacant-looking area may support livelihoods that are not obvious during a single visit.

Record rights and unresolved claims without asking the cluster manager to act as a court. Use competent local advisers and the relevant public authorities. Avoid making land access conditional on membership or promising compensation that has not been authorized. FAO tenure guidance is a reference for responsible governance, while national law determines the applicable process. [S11]

- Establish the authority of the person offering land or a long lease.
- Document existing users and proposed restrictions before final design.
- Keep grievances open until an agreed resolution is recorded and implemented.

Apply and review

Prepare a land-access evidence list for a proposed hub. Identify which evidence comes from public records, rights holders, community consultation and independent professional review.

Application notes

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Make benefits and burdens visible

Community benefits may include paid work, local purchases, training, infrastructure and producer income. Burdens may include traffic, water pressure, noise, waste and unequal access. A credible benefit plan records both and identifies who is affected.

Do not confuse the value of a project investment with benefits received by households. A building is an asset; its contribution depends on use and access. Set measurable commitments within the enterprise's control. Where a service is shared with the community, define maintenance and operating costs so the service does not fail when initial funding ends.

- Specify eligibility and selection criteria for jobs and services.
- Report actual payments and completed services, not only promised opportunities.
- Identify mitigation for people who bear costs without receiving direct benefits.

Apply and review

Compare two groups: participating farmers and nearby non-participating households. List benefits, burdens and influence for each. Propose one change that improves fairness without making an unfunded promise.

Application notes

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Build representation that can challenge management

Representation works when members can obtain information, question decisions and replace representatives through an agreed process. A committee of prominent names without access to operating information is not meaningful oversight. Provide timely records, clear mandates and a way to disclose conflicts.

Reserve board attention for purpose, strategy, performance, major risks and management accountability. Routine operating choices belong to authorized staff. Member voting and ownership rights depend on the selected legal form. The ILO cooperative recommendation provides an international reference for voluntary, jointly owned and democratically controlled enterprise; it does not replace local registration requirements. [S12]

- Define representative terms, selection and reporting obligations.
- Separate oversight from procurement and cash handling where possible.
- Record conflicts before discussion and remove conflicted decision makers as appropriate.

Apply and review

Simulate a meeting about hiring a director's relative. Record the conflict, available options, decision authority and evidence needed to demonstrate a fair process.

Application notes

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Operate an accessible grievance mechanism

A grievance mechanism gives people a practical way to raise concerns without retaliation. Accept concerns through more than one channel, including an option for people who cannot read or use digital tools. Tell complainants how their information will be used and what response they can expect.

Assign a case number, acknowledge receipt, assess urgency and appoint a reviewer who is independent of the complaint. Protect confidentiality while avoiding promises that no lawful disclosure will ever be necessary. Serious safety, safeguarding or rights concerns may require referral beyond the cluster. Keep a record of action and check whether the remedy worked.

- Publish contact routes and explain the process during onboarding.
- Distinguish a service complaint from an urgent protection concern.
- Monitor unresolved cases and repeated themes without exposing personal details.

Apply and review

Test the mechanism with a complaint from a seasonal worker about unpaid wages. Identify how they can report safely and how payment evidence will be checked.

Application notes

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Review governance through actual decisions

A governance review should examine decisions rather than only organizational charts. Select recent examples involving money, membership, product rejection and complaints. Reconstruct the information available, authority used, alternatives considered and follow-up. Compare practice with the charter.

Small failures often reveal wider weaknesses. An undocumented exception may allow a manager to favour one supplier. Late financial reports can prevent members from questioning deductions. Correct the process and communicate changes. Removing a person without repairing the underlying control leaves the same failure available to a replacement.

- Select a sample of decisions across functions and stakeholder groups.
- Check whether affected people received understandable reasons.
- Assign corrective actions with dates and evidence of closure.

Apply and review

Review one disputed decision. Write a neutral chronology, identify missing evidence and propose a fair review route. Do not assume that disagreement alone proves misconduct or that authority alone proves fairness.

Application notes

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CHAPTER 06 | 1 OF 6

Governments and enabling institutions



Irrigation farming in Nigeria. Documentary example; photograph by Haneef33. Source and licence: pp. 197–199.

Governments provide rules, infrastructure, public services and coordination. The cluster manages its own commercial commitments. A supportive public meeting should not be described as a permit, procurement award, sovereign guarantee or approval of investment forecasts.

Build an institutional map covering agriculture, land, water, environment, food safety, labour, business registration, education and trade. Identify the authority responsible for each decision in the specific country. Where functions overlap, request written clarification and retain the response. Avoid routing every request through the most senior political contact when an operational service has an established process.

- Separate policy dialogue from applications for specific permissions.
- Record official decisions, validity periods, conditions and renewal responsibilities.
- Keep commercial forecasts under the cluster's own accountability.

Apply and review

Prepare a government engagement note that asks for one defined action. State the public purpose, evidence supplied and decision sought, without implying endorsement beyond that action.

Related reference framework: [S14], [S15]. See pages 193–196.

Application notes

Build a practical permissions register

A permissions register identifies what must be authorized before a specific activity starts. Requirements differ by location, product, scale and process. A farm, packhouse, slaughter facility, school programme and export shipment can involve different authorities.

For each proposed activity, record the responsible regulator, evidence required, application status, conditions and expiry. Have a competent person confirm the register. Do not treat an online checklist from another country as local legal advice. Put permission milestones into the implementation schedule so buildings and equipment are not commissioned before an essential approval is obtained.

- Link each permission to an activity, site and accountable manager.
- Preserve submitted documents and official responses in a controlled folder.
- Record renewal lead times and changes that require a new application.

Apply and review

Select a proposed drying and packing facility. List the questions to ask public authorities about land use, water, waste, premises, worker safety and export documentation. Mark unresolved answers explicitly.

Application notes

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Align public infrastructure with real demand

Public investment in roads, water, power or digital connectivity can support many enterprises. A cluster proposal should explain the actual service gap, beneficiaries, expected use and maintenance arrangement. Avoid assuming that all project-specific costs should be publicly funded.

Compare alternatives such as repairing an access road, scheduling collection differently or using an existing facility. Show who will operate and maintain the improvement after construction. If access is shared, establish transparent eligibility and charging rules. Infrastructure that exists but is unreliable may be less useful than a smaller service with a funded maintenance plan.

- Quantify the constraint using delays, lost loads or unavailable operating hours.
- Explain benefits outside the sponsoring enterprise.
- Include ownership, upkeep, recurrent cost and accountability in the proposal.

Apply and review

Prepare an evidence brief for an unreliable road crossing. Compare repair with route diversion using seasonal access, vehicle cost and affected users. Identify the public and private responsibilities for each option.

Application notes

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Design public partnerships with clear obligations

A memorandum of understanding can define collaboration, but its title does not establish funding or enforceability. State whether each obligation is binding, subject to approval or simply an intention. Public procurement, grants and public-private partnerships have jurisdiction-specific rules that need separate review.

A workable partnership document identifies purpose, deliverables, resources, decision authority, reporting, data sharing, asset ownership, dispute handling and termination. Publish appropriate information while protecting personal and commercially sensitive records. Change control matters: new activities should not be added informally to an agreement with no budget or mandate.

- Obtain authorized signatures and preserve the approved version.
- Distinguish money committed from funding being sought.
- Define how the partnership will be evaluated and ended if necessary.

Apply and review

Review a draft partnership paragraph stating that government will support the cluster. Rewrite it into specific actions, responsible offices, expected evidence and any conditions requiring further approval.

Application notes

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Connect school agriculture to educational purpose

School participation should support learning and safeguarding. A school plot, digital module or demonstration facility must have clear educational outcomes, supervision and age-appropriate tasks. It should not become a source of unpaid hazardous labour or an informal commercial obligation for learners.

Agree the programme with the school and relevant education authorities. Define use of land, water, tools, photographs and learner data. Adults should handle activities beyond learners' permitted competence or risk level. Revenue and donated inputs need transparent records so educational resources are not diverted into private enterprises.

- Define learning objectives before setting production targets.
- Obtain applicable permissions for participation, media and data use.
- Provide supervision, protective arrangements and a route to raise concerns.

Apply and review

Design a lesson on traceability using a small school garden. Identify what learners observe, record and explain, and which activities remain the responsibility of trained adults.

Application notes

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Report public value without overstating causation

A cluster may contribute to local purchasing, jobs, skills, food availability and resource stewardship. Reporting should distinguish activities from outcomes. Training attendance is an activity; demonstrated competence is an outcome. Export revenue is commercial performance; public value depends on who benefits and at what cost.

Use a baseline and consistent definitions. Record other factors that could influence results, such as weather, commodity prices and public programmes. Avoid claiming that every improvement was caused by the cluster. A credible report includes shortfalls, distribution of benefits and the cost of delivering support.

- Define the unit, period, data source and owner for every public indicator.
- Disaggregate where appropriate without exposing personal information.
- Explain assumptions and unresolved data limitations.

Apply and review

Rewrite a claim that the project created 500 jobs. Specify whether these are positions, people, seasonal workdays or full-time equivalents, and what evidence would support the revised statement.

Application notes

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CHAPTER 07 | 1 OF 6

Youth leadership and enterprise pathways



Climate-smart agriculture training involving women farmers in Nyando, Kenya, 2013. Photo V. Atakos / CCAFS. Source and licence: pp. 197–199.

Youth participation should lead to capability, voice and realistic opportunities. Avoid treating young people only as volunteers, promotional figures or future farm labour. Clusters need services such as nursery work, equipment maintenance, digital records, logistics coordination, packaging and sales as well as production.

Map opportunities against actual demand and required competence. A youth enterprise needs a paying customer, clear costs and access to tools. Training alone does not create a market. Provide a pathway from supervised practice to reliable service delivery, with transparent selection and feedback.

- Identify a task currently causing delay, cost or unreliable quality.
- Define the service output and the customer willing to pay for it.
- Distinguish paid work, training placements and voluntary community activity.

Apply and review

Choose one youth enterprise opportunity. Name its first potential customer, minimum equipment, competence test and payment basis. Explain why the customer would use it instead of an existing provider.

Related reference framework: [S07]. See pages 193–196.

Application notes

Select participants fairly and inclusively

Selection should match the programme's purpose while avoiding unnecessary exclusion. Literacy, connectivity, travel cost, disability, caring responsibilities and access to land can affect participation. A single online application may exclude capable people who need an alternative route.

Publish criteria and explain which conditions are essential for safety or role performance. Offer reasonable support where possible rather than lowering important standards silently. Keep selection records and a review process. Youth leaders should disclose personal relationships when recommending participants and should not charge unofficial access fees.

- Use more than one recruitment channel and accessible application methods.
- Evaluate readiness to learn separately from existing wealth or equipment ownership.
- Explain selection outcomes and opportunities for future participation.

Apply and review

Review a proposed requirement that every applicant own a smartphone and land. Determine whether each condition is necessary for the chosen enterprise pathway and design an alternative where it is not.

Application notes

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Structure a supervised apprenticeship

An apprenticeship or placement should define duration, tasks, supervision, learning evidence and any payment. Use terminology that fits local education and labour rules; do not imply a nationally recognized qualification unless it exists. Agree expectations with the host and participant before work starts.

Begin with observation and controlled practice, then increase responsibility as competence is demonstrated. The supervisor should have time to teach and authority to stop unsafe work. Record feedback, attendance and completed tasks. A placement that only fills staffing gaps without teaching is not a credible learning programme.

- Specify permitted tasks and tasks requiring direct supervision.
- Establish payment, insurance and welfare arrangements as locally applicable.
- Assess practical performance against observable criteria.

Apply and review

Create a four-week placement for a collection-point assistant. Sequence weighing, lot labelling, record entry and customer communication. State what evidence allows progression to independent work.

Application notes

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Test a service business before financing expansion

A service pilot should establish whether customers buy, costs are known and delivery is reliable. Start with hired or shared equipment where feasible. Record travel, consumables, repairs, administration and unpaid time rather than counting only materials.

Set a price that covers delivery and supports maintenance. Where a subsidy lowers the introductory price, explain the eventual commercial price. Avoid financing equipment whose utilization depends on unconfirmed cluster growth. A small profitable service with repeat customers is stronger evidence than a large asset with no bookings.

- Calculate contribution per completed job after variable costs.
- Include realistic booking gaps and non-payment risk.
- Agree who owns customer records, equipment and improvements.

Apply and review

A service charges USD 40 per visit and incurs USD 26 in variable cost. Calculate contribution per visit, then determine the visits needed to cover USD 280 monthly fixed costs. Explain why revenue is not take-home income.

Application notes

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Develop leadership through accountable practice

Youth leaders need listening, facilitation, record keeping and conflict-handling skills. Their role is to represent participants and improve coordination, not to bypass technical controls or make promises on behalf of the cluster. Give them a clear mandate and access to the information needed to fulfil it.

Use rotating responsibilities so leadership is learned through practice. Ask leaders to chair a review, document decisions or organize a learning session. Evaluate the quality of follow-up and inclusion, not simply speaking ability. Provide mentoring and a safe route to report pressure or misconduct.

- Define what the leader can decide and what must be escalated.
- Review whether quieter and less connected participants are heard.
- Record commitments with owners and dates.

Apply and review

Facilitate a meeting about unequal access to a shared machine. Produce a neutral issue summary, an agreed next action and a record of unresolved disagreement without promising an outcome beyond your authority.

Application notes

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Measure progression and avoid inflated job claims

Track participant progression from recruitment to attendance, competence, service delivery and paid opportunity. These stages are related but not equivalent. A participant who attended one session is not automatically an entrepreneur or a permanent employee.

Follow up after completion to understand continued activity and barriers. Record workdays, earnings or customers with consent and reasonable verification. Compare outcomes across participant groups and identify where the pathway loses people. Use the evidence to change programme design rather than merely highlighting the strongest success story.

- Define completion and competence before the course begins.
- Count repeat participation without duplicating unique participant totals.
- Record discontinued enterprises and reasons as well as active ones.

Apply and review

Design a three-month follow-up survey with five questions. Include one verification method for paid work and one question that captures whether the participant found the training useful even without immediate employment.

Application notes

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CHAPTER 08 | 1 OF 6

Digital schools and shared expertise



A farm extension session in Kenya. Documentary example of shared learning; photograph by Samuel Macharia. Source and licence: pp. 197–199.

A digital school in the ABC model connects structured learning with practical work. It can combine online lessons, printed guides, demonstrations, mentoring and assessment. The technology is a delivery method; the educational objective is competent action in a real production or business setting.

Start with tasks participants need to perform: identify a lot, prepare a harvest plan, calculate contribution or respond to a failed quality check. Work backwards to the knowledge and practice required. Avoid long content libraries without a learning route or feedback. State the status of certificates accurately and distinguish internal completion from external accreditation.

- Define outcomes as observable actions rather than broad topics.
- Pair each lesson with a field or business task.
- Assess the task using published criteria and useful feedback.

Apply and review

Convert the topic of traceability into three learning outcomes. For each, describe the evidence a learner must produce and the error that would require further practice.

Related reference framework: [S02], [S16]. See pages 193–196.

Application notes

Design access for low connectivity

Learners may share devices, use intermittent power or travel to obtain connectivity. Plan for these conditions from the beginning. Provide downloadable lessons, readable mobile layouts, small files and printable worksheets. Avoid requiring a continuous video stream for essential instruction.

Choose a reliable method for distributing updated material and withdrawing obsolete versions. Keep an offline submission route and tell learners when their work has been received. Accessibility includes language, reading demands and disability, not only internet availability. Test the course with participants using the least capable devices expected in the programme.

- Put essential instructions in text and supply image descriptions.
- Make assessment timing compatible with work and connectivity constraints.
- Provide a contact route for technical and learning support.

Apply and review

Test one lesson using a shared basic smartphone and no live connection. Record which tasks remain possible, what must be downloaded in advance and how feedback will return to the learner.

Application notes

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Combine field schools with digital support

Field learning allows participants to observe conditions, compare options and discuss evidence. Digital tools can preserve records, share photographs and connect a local group to specialists. They should support the learning conversation rather than replace observation with automatic advice.

FAO's farmer field school resources provide a reference for participatory, field-based learning. [S02] For an ABC group, select a local question such as drying loss or irrigation scheduling. Agree what will be compared, measure consistently and discuss results. Do not describe a single demonstration as conclusive research or imply FAO endorsement of an FPI course.

- Establish a question that matters to participating farmers.
- Keep comparison conditions and measurements understandable.
- Separate observed results from explanations still requiring investigation.

Apply and review

Design a field session comparing two harvest-container practices. Record the question, observations, participant discussion and one decision that can reasonably follow from the exercise.

Application notes

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Organize experts around response and follow-up

Shared expertise can include agronomists, engineers, food technologists, veterinarians, logistics specialists, accountants and educators. Maintain a competence register showing qualifications, practical experience, service scope and availability. The most senior expert is not always the right person for a particular question.

Use a referral process that records the question, evidence supplied, urgency and requested output. Ask experts to distinguish findings, assumptions and actions needing further verification. Keep advice linked to the case and review its result. Informal messaging can support urgent communication but should not become the only record of consequential decisions.

- Define triage for urgent safety, disease or product concerns.
- Agree response times and fees before requesting extended work.
- Preserve recommendations and responsibility for implementation.

Apply and review

Create a referral note for a dryer producing inconsistent batches. Include material identity, loading, observed conditions, measurements and the specific question for the engineer or food technologist.

Application notes

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Assess competence with practical evidence

Assessment should show whether the learner can perform the intended task. Combine explanation with demonstration, a completed record or a realistic decision exercise. Use clear criteria and distinguish critical errors from minor presentational issues.

A learner may need another opportunity after feedback. Record reassessment without erasing earlier evidence. Protect assessment integrity while allowing reasonable adjustments for language or disability. Where remote evidence is used, confirm identity and ask follow-up questions to establish understanding. Do not award competence solely because fees were paid or videos were watched.

- Publish the task, evidence required and assessment criteria.
- Train assessors to apply the same standard consistently.
- Retain results securely with an appeal route.

Apply and review

Develop a practical assessment for weighing and identifying a delivery. Specify four pass criteria, one critical error and the feedback needed before a learner repeats the task.

Application notes

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Fund learning without compromising its purpose

An academy can earn income from courses, services and commissioned training. Its budget should include content development, facilitators, learner support, assessment, technology, updates and accessible delivery. Gross enrolment revenue is not the amount available to subsidize farming.

Use conservative completion and payment assumptions. Separate scholarship funding from commercial fees and publish refund terms. Avoid promising that course income will automatically finance every cluster asset. Where training is required for supplier approval, explain the requirement and keep assessment independent of pressure to sell more courses.

- Track learner support costs and outcomes alongside enrolments.
- Price commissioned training against actual delivery requirements.
- Reserve funds for updating technical content and correcting errors.

Apply and review

Build a course budget for 40 learners using your own labelled assumptions. Calculate revenue, delivery cost and remaining contribution, then test the effect of 25 paid enrolments rather than 40.

Application notes

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CHAPTER 09 | 1 OF 6

Agricultural intelligence and digital operations



Agricultural research laboratory in Afghanistan. Photograph by Jennifer Lindsey, USAID; public domain. Source and licence: pp. 197–199.

Agricultural intelligence connects observations to decisions. A useful system answers a practical question: whether to irrigate, accept a lot, book a vehicle or release payment. Sensors, satellites and dashboards are possible inputs; none removes the need to understand the decision and verify its consequences.

List decisions by timing and risk. A same-day harvest decision may require field observation and processor capacity. A seasonal investment decision needs a different evidence set. Collect the minimum data that improves the decision reliably. More data can create cost and confusion when nobody uses it or checks its quality.

- Specify the decision, responsible person and latest useful decision time.
- Identify required data, acceptable uncertainty and a fallback method.
- Record the action taken so results can improve the next decision.

Apply and review

Choose one costly recurring decision. Describe the present method, information gap and smallest digital improvement that could be tested within one production cycle.

Related reference framework: [S04], [S16]. See pages 193–196.

Application notes

Build a minimum data model

A cluster needs consistent identifiers for participants, sites, fields, products, lots, processes, deliveries and payments. The data model explains how these records relate. It should allow a delivery to be traced to source fields without storing the same personal information in every transaction.

Define fields before choosing software. Include units, dates, permitted values and ownership. A quantity without a unit or a moisture basis can be misleading. A status such as approved must refer to a specific approval scope and date. Keep reference lists under version control so names and codes do not change unpredictably.

- Use stable identifiers that do not expose sensitive personal information.
- Separate master data from events such as harvests and shipments.
- Record who entered, checked and corrected consequential information.

Apply and review

Draft a data dictionary for a harvest event with ten fields. Include product identity, field, date, quantity, unit, lot and responsible person. Test whether a second user interprets every field consistently.

Application notes

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Check data before building a dashboard

Data quality concerns completeness, correctness, consistency, timeliness and fitness for use. A dashboard can display a wrong number very convincingly. Check records at collection and again before reporting. Preserve the original observation when correcting an error.

Use simple tests: impossible dates, duplicate identifiers, negative weights, inconsistent units and deliveries larger than available stock. Compare a sample of digital entries with source records. Missing data should appear as missing rather than zero. Explain whether values are measured, estimated, forecast or illustrative.

- Define validation rules and an exception owner for each important field.
- Log corrections with reasons rather than overwriting history silently.
- Review whether late entries affect decisions or period comparisons.

Apply and review

Audit ten delivery records. Find at least one potential unit error, duplicate or missing field. Explain which reported measures could change and how the correction should be approved.

Application notes

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Choose technology that can be maintained

Evaluate a digital tool against user needs, cost, connectivity, interoperability, security and support. Consider subscription fees, devices, data entry, training, backups and replacement. A system that depends on a single volunteer's personal account creates continuity risk.

Pilot with real users and representative tasks. Test offline work, synchronization, corrections, export and account recovery. Ask whether the organization can retrieve its data if the supplier relationship ends. Automation should reduce a demonstrated burden; it should not force staff to maintain duplicate systems indefinitely.

- Assign organizational ownership of accounts and administrator access.
- Confirm usable data export and documented backup restoration.
- Include support and exit terms in procurement decisions.

Apply and review

Compare a spreadsheet, a simple mobile form and a specialist platform for one workflow. Use total operating cost and reliability rather than feature count as the main comparison.

Application notes

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Govern privacy access and data sharing

Personal, commercial and operational data need different access rules. Explain what information is collected, why, who receives it and how long it is retained. Use the lawful basis and protections required in the relevant jurisdiction. Consent is not a substitute for every legal obligation.

Give people access appropriate to their roles. A buyer may need a lot's production evidence without receiving a farmer's private identity documents. Protect devices, accounts and backups. Review access when staff or service providers leave. Publish only aggregated information where individual disclosure is unnecessary.

- Classify records and assign retention and deletion responsibilities.
- Separate learner, producer, commercial and public-reporting data.
- Establish an incident response route for lost devices or unauthorized access.

Apply and review

Design an access matrix for farmer records, laboratory results and payment information. Explain what a buyer, trainer, driver and finance officer can see and why.

Application notes

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Use forecasts and artificial intelligence cautiously

A forecast is a conditional estimate, not a measurement of the future. Record the training or historical data, assumptions, period, uncertainty and intended use. Compare predicted and actual results over time. A model that performs well in one location may fail with a different crop, climate or management regime.

AI can help summarize records or identify issues for review. It should not autonomously prescribe hazardous interventions, approve product release or create unsupported market claims. Keep a human decision owner and a fallback method. Verify generated explanations against original evidence rather than assuming fluent wording is correct.

- Label forecasts and simulated dashboard values clearly.
- Test errors that would materially harm farmers or product users.
- Retain the input evidence and approval for consequential decisions.

Apply and review

Take one yield forecast and list its assumptions. Develop a lower-output scenario, then describe the planting, financing and processing decisions that should remain reversible until evidence improves.

Application notes

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CHAPTER 10 | 1 OF 6

Land soil water and climate resilience



Irrigation water handling in Ghana. Documentary example; photograph by Vrinda Khushu. Source and licence: pp. 197–199.

Resource assessment establishes what the site can sustain. Examine soil characteristics, water availability and quality, climate, slope, drainage, access and surrounding land uses. Use competent field assessment and appropriately targeted laboratory work. A productive neighbouring farm is useful context, not proof that the proposed site has the same conditions.

Translate findings into design limits. Water may constrain planted area, while soil variation may require separate management zones. Protect sensitive areas and access routes before field layout. Keep the assessment linked to the intended product and processing route rather than treating it as a generic report filed after investment approval.

- Identify seasonal constraints and the reliability of critical resources.
- Distinguish observed facts from assumptions requiring investigation.
- Record design changes caused by the assessment.

Apply and review

Prepare a site decision brief with three sections: suitable uses, conditions requiring correction and unresolved questions. Explain which unresolved question would prevent an investment commitment.

Related reference framework: [S08], [S11]. See pages 193–196.

Application notes

Sample soil and water for a purpose

A sampling plan begins with a question and an intended interpretation. Discuss the site, crop, history and suspected risks with a competent adviser or laboratory. Define sample locations, depths, timing, containers, preservation and identification according to the requested analysis.

Avoid mixing samples from visibly different management zones unless the sampling plan justifies it. Keep a record of who collected each sample and where it came from. A laboratory result describes the submitted material; it does not automatically characterize every field or season. Interpretation should account for method, units and local crop requirements.

- Confirm laboratory instructions before collecting samples.
- Map sample locations and retain chain-of-custody details.
- Compare repeat results only when methods and sampling conditions are understood.

Apply and review

Write a sampling request for a proposed herb block near a livestock area. Explain the agronomic and contamination questions separately and identify the professional who will interpret the results.

Application notes

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Build a water budget with explicit units

A water budget compares reliable supply with crop, processing, cleaning and domestic requirements. Include storage, delivery efficiency and periods when a pump or source may be unavailable. Do not size a commercial planting programme from a borehole's short pumping observation alone.

For planning, 1 mm of water over 1 hectare equals 10 cubic metres. If a measured net requirement were 4 mm per day over 5 hectares, net demand would be 200 cubic metres per day. At an assumed 80 percent application efficiency, gross irrigation demand would be 250 cubic metres per day. These are teaching assumptions, not crop prescriptions.

- Verify sustainable source capacity and applicable abstraction conditions.
- Keep irrigation and processing demand on the same daily or weekly basis.
- Add a contingency based on actual failure and storage risks.

Apply and review

Recalculate the example for 3 hectares and 75 percent efficiency. Then list the additional information needed before selecting a pump, tank or irrigation system.

Application notes

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Manage soil condition through a monitored plan

Soil management should respond to measured constraints and crop needs. Consider structure, organic matter, compaction, drainage, nutrient balance and erosion. Use an integrated plan rather than assuming that one amendment solves every problem. An organic input can still introduce contaminants, salts or nutrient imbalance.

Document amendment identity, source, quality, application and intended effect. Keep unsuitable materials away from food-production areas. Observe plant response and soil condition over time. Where nutrient recommendations depend on local laboratory interpretation, record the professional advice instead of transferring a universal rate from a different site.

- Maintain protective cover and drainage suited to the local system.
- Assess amendments before use and preserve application records.
- Review whether interventions improve saleable output and resource condition.

Apply and review

Compare two soil-management options for a compacted block. Explain costs, timing, expected evidence of improvement and any conditions that would make either option unsuitable.

Application notes

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Prepare for drought floods and heat

Climate resilience is the ability to anticipate, absorb and recover from disruption. Identify hazards relevant to the site rather than using a single national forecast as a field instruction. Assess exposure of crops, people, infrastructure and transport routes.

Build actions around triggers. Declining storage may require revising planting, while forecast heavy rain may require clearing drains and protecting stock. Agree who receives forecasts and who can act. Retain safe access and emergency arrangements. FAO's climate-smart agriculture sourcebook is a planning reference; local forecasts and professional assessments determine site actions. [S08]

- Map vulnerable assets, alternative routes and emergency contacts.
- Prioritize water-critical operations and protect essential records.
- Review the plan after a real event or simulation.

Apply and review

Develop drought and flood trigger tables for your cluster. Use locally verified thresholds or clearly mark proposed thresholds for technical review before adoption.

Application notes

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Measure resource efficiency without concealing damage

Resource efficiency compares inputs with useful output, but the boundary matters. Lower water per kilogram may result from a higher yield while total abstraction still exceeds a sustainable level. Energy savings at the hub may shift fuel use to farmers or transporters.

Track both intensity and absolute use where material. Record water, energy, losses and saleable output using consistent periods and units. Explain changes in product mix or measurement coverage. Do not label a practice regenerative or climate positive without defining the claim and the evidence supporting it.

- State the site, activities and time period included in each measure.
- Keep total resource use alongside output-based ratios.
- Investigate improvements that coincide with worsening environmental conditions.

Apply and review

Calculate water per kilogram for two periods using your own data. Then explain why the ratio alone cannot establish sustainable abstraction, fair community access or resilience during drought.

Application notes

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CHAPTER 11 | 1 OF 6

Harvesting aggregation and post harvest control



Women harvesting vegetables. Documentary production example; see full source and licence in the credits. Source and licence: pp. 197–199.

Harvest planning connects field readiness to labour, containers, transport and processing availability. Confirm the receiving facility's capacity before releasing work to the field. A technically mature crop can deteriorate while waiting for unavailable equipment or a delayed vehicle.

Create a daily harvest plan showing blocks, product identity, estimated quantity, labour, start time, destination and handling needs. Include weather and access checks. Update the plan when conditions change and inform the receiving team. Avoid harvesting merely to keep workers busy when suitable handling cannot follow.

- Verify crop readiness against the intended product specification.
- Prepare clean suitable containers and identification materials in advance.
- Confirm who can postpone harvest when a critical service fails.

Apply and review

Build a harvest plan for three farms supplying one dryer. Identify the latest field release time that avoids overnight accumulation, using measured handling and journey times.

Related reference framework: [S03], [S04]. See pages 193–196.

Application notes

Preserve hygiene from the first container

Contamination can enter during harvest through hands, tools, containers, soil, water, animals or unsuitable contact surfaces. Select controls appropriate to the product and intended use. Clean visibly dirty containers before use and keep rejected or contaminated material separate.

Train workers through demonstration. Show where containers may be placed, how tools are cleaned, how illness is reported and how the lot is identified. A written hygiene rule is ineffective if the field lacks suitable washing facilities or clean storage. Supervisors should check actual behaviour and correct the conditions causing repeated errors.

- Use containers and contact materials suitable for the product.
- Separate chemicals, waste, personal items and harvested material.
- Record incidents that could affect lot acceptance.

Apply and review

Observe a simulated harvest transfer from plant to collection point. Identify three contamination routes and propose controls that workers can actually maintain under local field conditions.

Application notes

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Establish transparent reception and weighing

Reception confirms identity, quantity, condition and responsibility at a transfer point. Display the weighing method and provide a receipt that the supplier can understand. Record tare, gross and net weight where relevant, and identify the scale used.

Check lot labels before mixing material. Record arrival time and acceptance status. Disagreement should be documented while evidence is available. Maintain scales and verify performance using suitable procedures. Do not hide service charges or quality deductions inside an unexplained difference between field and reception weights.

- Link each receipt to farmer, field or source, product and lot.
- Record rejected or held quantity separately from accepted quantity.
- Provide a witnessed correction route for disputed weights.

Apply and review

Design a reception receipt for a farmer who cannot access the online system. Include enough information to reconcile quantity, quality status and later payment without disclosing unnecessary personal details.

Application notes

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Manage storage by condition and status

Storage protects identity and condition while material waits for processing or dispatch. Requirements differ for fresh produce, dried ingredients, chilled products and packaging. Define conditions using product-specific professional guidance and verified buyer requirements rather than a universal storage rule.

Separate held, accepted, rejected and released stock. Record location and movement so staff can find the correct lot without opening every package. Inspect for moisture, pests, damaged packaging and contamination. Use stock rotation appropriate to expiry and condition, and investigate differences between physical and recorded stock.

- Keep material off unsuitable surfaces and protect it from weather and pests.
- Monitor conditions with equipment and frequency suited to the product.
- Restrict access to product awaiting a decision.

Apply and review

Walk a proposed store and map status zones, movement routes and inspection points. Explain how a temporary hold can be maintained when storage space becomes scarce.

Application notes

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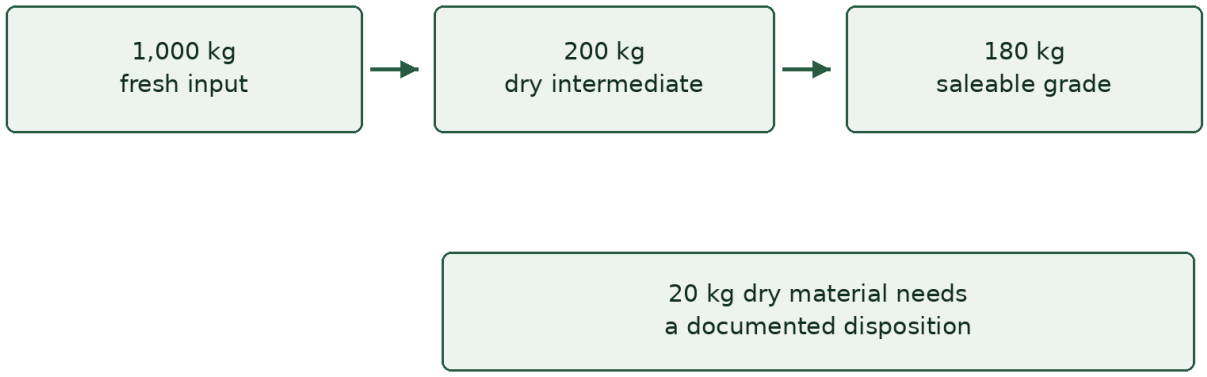
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Quantify losses on a consistent basis

Loss measurement distinguishes expected process conversion from avoidable loss and rejected output. Drying reduces water mass intentionally; this is not the same as spoilage. Record the basis of each quantity so comparisons remain meaningful.

For a trial, 1,000 kg of fresh material might produce 200 kg of dry intermediate, of which 180 kg meets the saleable grade. The dry recovery is 20 percent of fresh input, while saleable recovery is 18 percent. The 20 kg difference requires a documented disposition. These are illustrative values and must not be treated as moringa or other crop benchmarks.

- Weigh input, intermediate, saleable output and separated material.
- Record moisture basis and any unmeasured residues.
- Investigate repeated losses by stage and cause.



Illustrative example only. Water removal is a conversion.

Apply and review

Reconstruct a batch mass balance and identify any unexplained quantity. Explain whether the difference could arise from water removal, sampling, spillage, rejection or an inaccurate scale.

Application notes

Coordinate aggregation without losing identity

Aggregation can lower transaction costs and help meet shipment quantities. It also increases the consequences of mixing. Combine material only when product identity, specification, status and traceability requirements allow it. A mixed lot inherits the constraints of its contributing sources.

Create a parent lot that links to every incoming lot and quantity. Retain the ability to allocate output and investigate a later problem. Explain pooling rules to farmers before delivery, including how quality differences affect payment. Avoid averaging a known contaminated lot into acceptable product.

- Confirm eligibility of every contributing source before pooling.
- Record the mixing event, quantities, operator and resulting identifier.
- Preserve separate routes for material with different status or specification.

Apply and review

Plan an aggregated shipment from five farmers. Identify the records needed to trace it backwards and forwards, then explain how one farmer's unresolved quality result changes the aggregation decision.

Application notes

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CHAPTER 12 | 1 OF 6

Bio processing and product development



Tomatoes in a stainless steel food grinder. Documentary processing example; photograph credits retained. Source and licence: pp. 197–199.

Bio-processing converts biological materials into products such as food ingredients, fibres, oils, feed or other materials. Each transformation needs a defined use, specification and economic purpose. A machine that can process a crop does not establish that the resulting product has a market.

Write a product brief before selecting technology. Include input identity, required output, acceptance criteria, packaging, shelf-life evidence, expected customer and applicable controls. Separate food, feed, cosmetic, technical and medicinal uses; they may involve different rules and validation. A process suitable for one category should not be assumed acceptable for another.

- Define the product and use before specifying equipment.
- Identify critical knowledge gaps and required professional support.
- Establish a trial route that can generate reliable data.

Apply and review

Prepare a product brief for a dried herbal ingredient. State which decisions depend on the buyer, food technologist, laboratory and local authority before a commercial launch.

Related reference framework: [S03], [S13]. See pages 193–196.

Application notes

Map the process from reception to release

A process map shows each operation, transfer, decision and temporary hold. Include cleaning, rework, sampling, waste, co-products and packaging rather than showing only the main machine. Walk the proposed flow with operators and compare it with the physical site.

At each stage, identify input, output, equipment, operator, record and conditions requiring a stop. Separate raw and ready-to-pack flows where necessary. A map is useful when it helps staff recognize an abnormal situation and know who decides what happens next.

- Include people, tools, water and packaging movements that can affect the product.
- Mark points where identity, quantity or status changes.
- Update the map after equipment or layout changes.

Apply and review

Map a leaf drying and milling route. Add a held-lot route and show where cleaning between different botanical species occurs. Identify one point where a shortcut could compromise identity.

Application notes

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Match capacity to the whole operating cycle

Equipment capacity depends on the material, loading, operating method, utilities, staff and required output condition. Obtain supplier trials using representative material. Include loading, unloading, cleaning, changeovers, maintenance and verification when calculating available production time.

A dryer rated for a maximum load may not produce acceptable material at that load under local conditions. Milling capacity may exceed packing capacity. Utility interruptions can reduce throughput further. Use observed effective capacity to schedule harvest and orders, and retain a contingency appropriate to the consequences of failure.

- Verify input and output basis for every capacity claim.
- Measure actual cycle times under representative conditions.
- Identify utilities and spare parts that can stop production.

Apply and review

Compare two dryers using saleable output per operating day, energy, labour, maintenance and quality consistency. Explain why purchase price and maximum load alone are insufficient for selection.

Application notes

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Develop products through controlled trials

Product development moves from concept to small trials, evaluation, pilot production and commercial release. Define the question each trial answers. Keep formulation, material identity and process conditions recorded so a successful result can be repeated.

Use competent technical review for safety, stability and intended use. Sensory appeal alone does not establish shelf life or suitability. Obtain customer feedback on representative samples and preserve failed trial results. A change in raw material, packaging or process can require reassessment even when the product name remains unchanged.

- Define trial acceptance criteria before seeing the result.
- Keep trial product distinct from released commercial stock.
- Record what changed between versions and why.

Apply and review

Design a trial for a blended herbal tea ingredient. Identify the identity, contamination, sensory, packaging and intended-use questions that must be answered without making unsupported health claims.

Application notes

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Use toll processing with clear accountability

A toll processor provides a transformation service using its equipment and staff. This can reduce capital requirements, but the cluster remains responsible for understanding how its product is handled. Verify capability, hygiene, traceability, capacity and permitted activities before sending commercial material.

Agree input and output specifications, expected recovery, charges, ownership, losses, cleaning, sampling, release authority and dispute procedures. Check whether other products processed at the site introduce identity or allergen concerns. Conduct a trial and reconcile actual quantities and quality before relying on the service for a major order.

- Define who approves process changes and handles nonconforming material.
- Preserve source and output lot relationships.
- Agree access to relevant records and investigation support.

Apply and review

Draft the operational schedule to a toll-processing agreement. Include five measures that allow the cluster to verify the service without managing the contractor's entire business.

Application notes

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Decide when manufacturing is commercially justified

Manufacturing can create value, but it also adds fixed cost, technical risk and management demands. Compare own processing, contracted processing and sale of a less transformed product. Include utilization, working capital, quality losses, service support and buyer qualification.

Use stage-gated investment. First establish demand and process capability; then test the economics at realistic utilization. Do not assume all output will sell at the highest grade or that every co-product earns revenue. A smaller operation with a dependable service partner may be the appropriate first step.

- Separate capital expenditure from operating and financing costs.
- Calculate contribution under low, central and high utilization assumptions.
- Define evidence required before committing to expansion.

Apply and review

Write an investment recommendation comparing a shared mill with toll processing. State the assumptions that drive the result and the event that would justify revisiting the decision.

Application notes

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Quality food safety and product release



Make basic hygiene work every day

A food operation needs working arrangements for clean water, premises, equipment, cleaning, pests, waste, personal hygiene and staff competence. These foundations should operate before more complex assurance systems are added. A folder of procedures does not compensate for a dirty tool or unavailable handwashing water.

Walk the process during real work and identify where contamination could enter. Select controls that fit the material, equipment and environment. Train staff, provide resources and verify performance. Cleaning needs a defined method, responsibility and suitable evidence of effectiveness; appearance alone may not answer every hygiene question.

- Separate incompatible activities, materials and movement routes.
- Maintain equipment and facilities so they can be cleaned effectively.
- Record failures and correct their causes rather than repeatedly signing incomplete checks.

Apply and review

Observe one cleaning cycle. Compare the written procedure with available tools, water, time and staff understanding. Identify the change most likely to make the procedure reliable.

Application notes

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Analyze hazards with competent support

Hazard analysis examines biological, chemical and physical hazards relevant to the product and process. It requires knowledge of raw materials, intended use, processing and distribution. Use a competent team and validated technical information rather than generating a generic list for every commodity.

For each significant hazard, identify the control, acceptable operating conditions, monitoring, action when control is lost and evidence that the control is suitable. Not every inspection point is a critical control point. The classification and limits require technical justification. This manual provides management structure, not a substitute for a product-specific food safety plan.

- Verify the process map against actual operations.
- Identify where controls prevent, reduce or detect relevant hazards.
- Review the analysis after changes or unexpected failures.

Apply and review

Prepare questions for a food technologist reviewing a leaf-drying process. Include raw material, intended use, contamination routes, drying evidence and post-drying handling without inventing universal temperature limits.

Application notes

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Sample and test according to the decision

Testing supports a decision only when the sample, method and acceptance criteria are appropriate. Discuss lot definition, sampling design, containers, preservation and laboratory capability before collecting material. Record chain of custody and prevent sample substitution or contamination.

A passed sample does not prove that every unit in a poorly controlled batch is acceptable. Testing should complement process controls, not replace them. Retain method, units, limits, laboratory report and interpretation. Where a report is unclear, request clarification rather than converting an unfamiliar result into a pass.

- Define the decision and specification before ordering tests.
- Confirm which laboratory methods and accreditation scope are relevant.
- Keep held stock unavailable for sale until the authorized decision.

Apply and review

Review a mock laboratory report with a missing lot identifier. Explain what additional evidence is needed and why a favourable numerical result alone cannot justify releasing unidentified stock.

Application notes

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Control nonconforming product and rework

Nonconforming material fails a requirement or lacks enough evidence for acceptance. Identify it physically and in the stock system. Prevent accidental use and record the reason for hold, affected quantity and responsible decision maker.

Possible dispositions include further investigation, authorized rework, an alternative lawful use, return or disposal. Each needs technical and commercial justification. Rework must not conceal contamination or erase the product's history. Retest where the decision requires it and link the reworked lot to its source. Obtain buyer agreement where a changed product or specification affects the contract.

- Record decisions and conditions before staff move or alter held material.
- Assess whether the issue affects other lots or equipment.
- Verify that the chosen disposition was completed.

Apply and review

A dried lot has inconsistent moisture readings. Develop a hold-and-investigate plan, identify who may authorize rework and state the evidence required before any subsequent release.

Application notes

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Release a lot through evidence and authority

Product release is the documented decision that a defined lot meets the requirements for its next use or customer. The release reviewer should have access to production, testing, packaging, quantity and traceability records. Authority should be defined independently of pressure to dispatch.

Use a release checklist tied to the product specification. Verify that exceptions are resolved and labels identify the correct lot. Record the reviewer, date and scope of release. A buyer's urgent request or a truck at the gate does not remove unresolved safety or identity questions.

- Confirm product identity, quantity, condition and required reports.
- Match packaging and documents to the released stock.
- Keep an auditable record of approval and later changes.

Apply and review

Simulate a dispatch where the certificate of analysis is present but the packaging lot code differs. State the immediate action, investigation steps and the person authorized to decide when dispatch can resume.

Application notes

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Traceability certification and assurance



Pallet-rack warehouse. Documentary storage example; photograph by Axisadman. Source and licence: pp. 197–199.

Traceability connects a product to its source, transformation and destination. It supports investigation, stock control and customer confidence when records can be retrieved and understood. A barcode is only a carrier; the underlying relationships make tracing possible.

Define lots and events so material remains identifiable when it is combined, split, dried, milled or repacked. Record contributing inputs and resulting outputs. GS1 provides a reference framework for identifying, capturing and sharing traceability information across trading relationships. [S04] The cluster's implementation should fit its product and counterparties rather than assuming one label format suits every market.

- Keep stable identifiers and legible physical labels.
- Record transformations and dispatch destinations.
- Test retrieval using real records and stock.

Apply and review

Select a finished package and reconstruct its source lots, processing events and dispatch record. Note every missing link and decide whether the gap requires containment, correction or wider investigation.

Related reference framework: [S04]. See pages 193–196.

Application notes

Maintain mass balance and reconciliation

Mass balance compares recorded inputs, outputs, losses and stock within a defined period or batch. It helps identify missing records, incorrect units, unexplained loss and identity problems. The calculation must account for water removal and legitimate conversion.

For a dry-product store, opening stock plus receipts minus dispatches and authorized adjustments should equal closing stock. If opening stock is 400 kg, receipts 600 kg and dispatches 750 kg, expected closing stock is 250 kg before adjustments. Investigate a physical count of 230 kg rather than simply changing the ledger to match.

- Record the reason and approval for each adjustment.
- Keep moisture and conversion assumptions explicit in process balances.
- Review material differences proportionately to risk and value.

Apply and review

Reconcile a store with a 20 kg shortfall. List possible causes, evidence to examine and controls that prevent an undocumented adjustment from concealing theft or a recording error.

Application notes

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Treat certification as a defined scope

Certification is an assessment against specified requirements within a defined scope. The scope may identify sites, operators, products, processes and validity periods. It does not automatically cover every member or crop associated with an organization.

Before making a claim, obtain the current certificate and relevant scope documents. Confirm status with the issuing body where necessary. Distinguish application, audit, corrective action and certification. An audit appointment or payment does not establish approval. Buyers may require additional qualification even when a certificate is valid.

- Verify which entity and activity are covered.
- Control claim wording on labels, websites and sales documents.
- Track expiry, renewal, scope changes and outstanding findings.

Apply and review

Review a proposed claim that all cluster farmers are organic certified. Identify the documents needed to support it and draft narrower wording for a programme still preparing for assessment.

Application notes

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Manage group assurance through internal controls

A group arrangement can coordinate member records, inspections, training and corrective actions. Its exact requirements depend on the scheme and competent certification body. Establish the internal control system before assuming that a large membership list creates a certifiable group.

Maintain a current member register, site maps, production records, inspection findings and sanctions. Inspectors need competence and independence from the activity assessed. Document admissions, suspensions and scope changes. The system must detect and act on failures rather than simply prepare members for an external visit.

- Agree eligibility and evidence requirements with the relevant scheme.
- Keep internal inspection and corrective action records current.
- Prevent suspended material from entering claimed product flows.

Apply and review

Design an internal inspection schedule for a small pilot group. Explain how new members, major changes and unresolved findings affect inspection priority and eligibility to supply.

Application notes

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Prepare for a focused audit

An audit samples evidence against criteria. Preparation should make truthful records accessible and ensure staff understand their work. Do not backdate missing records or coach staff to conceal actual practice. A disclosed gap with a credible corrective plan is more useful than fabricated compliance.

Confirm audit scope, criteria, schedule, required people and document access. Run an internal check against the actual criteria. During the audit, answer clearly and distinguish evidence from recollection. Review findings to understand the requirement and evidence before agreeing the corrective action.

- Assign a coordinator without restricting legitimate access to relevant evidence.
- Keep findings, owners, deadlines and verification methods in one register.
- Address recurring causes, not only the visible example sampled.

Apply and review

Prepare an audit evidence pack for traceability. Include a real lot example, stock reconciliation, training record and mock-recall result, with a note identifying any current limitations.

Application notes

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Practice withdrawal and recall communication

A withdrawal or recall response needs rapid identification, containment, investigation and communication. Exact legal notification duties depend on product and jurisdiction. Obtain relevant professional guidance and maintain current authority and customer contacts.

Use a mock exercise to test how quickly records identify affected stock and recipients. Confirm quantities at the hub, in transit and with customers. Record the scenario and avoid presenting a drill as a real incident. Review communication accuracy and whether the team can act outside normal office hours.

- Appoint an incident lead and authorized spokesperson.
- Preserve evidence and prevent further movement of affected lots.
- Verify effectiveness and close corrective actions after the exercise.

Apply and review

Run a tabletop scenario involving a potentially contaminated batch distributed to three buyers. Account for all quantities and draft a factual notification that states the product, lot, concern and immediate action without speculation.

Application notes

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CHAPTER 15 | 1 OF 6

Logistics storage and delivery networks



Container cranes at the Port of Oakland. Documentary logistics example; photograph by Yair-haklai. Source and licence: pp. 197–199.

Logistics includes collection, loading, storage, transport, documentation and delivery. A route is suitable only if it preserves the product and meets the agreed delivery conditions. Fresh, chilled, dried and bulky low-value materials require different arrangements.

Map the journey and its handovers. Include waiting, loading and inspection time rather than using driving time alone. Assess road condition, vehicle suitability, security and contingency. The cheapest quoted transport may become expensive through damage, delay or missing evidence.

- Define product conditions and handling needs for the full journey.
- Allocate responsibility for each handover and exception.
- Test the route with representative loads before scaling.

Apply and review

Compare direct farm collection with a village aggregation point. Include farmer travel, vehicle utilization, waiting, hygiene and traceability. Explain who bears each cost and risk under both options.

Related reference framework: [S09]. See pages 193–196.

Application notes

Select and manage transport providers

A transport agreement should define vehicle condition, cleaning, load protection, schedule, handling, records and liability. Check whether the provider can meet the product's requirements with available equipment and drivers. Do not assume a vehicle used for another commodity is suitable without assessment.

Agree how delays and breakdowns will be communicated and who authorizes alternative arrangements. Inspect the vehicle before loading and record deficiencies. Retain proof of collection and delivery linked to lots. Service monitoring should include damage, timeliness, communication and claims, not simply quoted price.

- Verify capacity, insurance and applicable licensing with competent support.
- Prohibit incompatible loads and unapproved product transfers.
- Review provider performance after trial shipments.

Apply and review

Draft a transport booking for dried ingredients. Include load identity, packaging, destination, required conditions, contact points and the action required if the vehicle arrives contaminated or unsuitable.

Application notes

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Plan warehouses for safe movement

Warehouse design should support receiving, inspection, status separation, storage, picking and dispatch. Provide sufficient access for cleaning, inspection and emergency movement. Storage density should not make lots inaccessible or obscure pest and water damage.

Use a location system that staff can understand. Keep product, packaging, chemicals and waste in appropriate separate areas. Define stacking limits based on packaging, equipment and professional assessment rather than copying an arbitrary height. Check that people and vehicles can move safely during peak operations.

- Mark locations and status zones clearly.
- Protect goods from moisture, contamination and handling damage.
- Reconcile physical movement with stock records promptly.

Apply and review

Draw a warehouse layout for incoming held lots, released dry product and packaging. Trace a receiving-to-dispatch route and identify where it crosses an incompatible activity.

Application notes

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Protect temperature sensitive products

A cold chain is a controlled sequence from the point cooling is required through storage, transport and delivery. Product-specific limits and validation need competent technical input. A cold room does not guarantee control if product enters too warm, doors remain open or vehicles cannot maintain conditions.

Record loading condition, equipment status, journey monitoring and handover. Define the response to an excursion before dispatch. Investigate time, temperature, product condition and intended use; do not automatically release or discard based on a single unexplained reading.

- Use suitable monitoring equipment and verified placement.
- Maintain contingency for power loss and vehicle failure.
- Keep records linked to the affected lots and decision.

Apply and review

Design a chilled-product handover checklist. State the evidence needed to assess a delayed delivery and identify who can authorize further movement after an unresolved temperature excursion.

Application notes

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Calculate the delivered cost

Delivered cost includes the product and all costs required to reach the agreed delivery point. Include packaging, inland handling, testing, documents, freight, insurance where applicable, finance and expected loss. Avoid comparing an ex-farm price with a delivered export price as if they were equivalent.

Allocate fixed shipment costs over realistic saleable quantity. A small sample shipment may have a high unit cost that does not represent a full order. Currency, weight basis and delivery terms must be explicit. Keep quoted, estimated and actual costs distinguishable.

- Record the named delivery point and included services.
- Include handling losses and rejected quantity on a consistent basis.
- Update cost estimates after actual shipment settlement.

Apply and review

A shipment has USD 900 fixed logistics cost and 600 kg saleable product. Calculate logistics cost per kilogram, then repeat for 300 kg. Explain the effect on order consolidation decisions.

Application notes

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Control delivery evidence and claims

Delivery closes a physical movement but may not close the commercial transaction. Obtain evidence of receipt, quantity, condition, lot identity and any reservation. Know how long the contract allows the buyer to inspect and raise a claim.

When a claim arises, preserve original records, photographs and relevant samples. Compare dispatch, transit and receipt evidence before assigning responsibility. Communicate promptly and factually. A credit note should identify the agreed basis and approval rather than becoming an undocumented adjustment to farmer payments.

- Retain proof of delivery linked to the sales order and invoice.
- Record shortages, damage and condition concerns at the handover.
- Reconcile claim settlement with transport and supplier responsibilities.

Apply and review

Investigate a buyer claim for 30 damaged packages. Identify the dispatch, vehicle and receipt evidence needed, and state how the affected farmer payments will be protected from arbitrary deductions during investigation.

Application notes

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CHAPTER 16 | 1 OF 6

Global buyers and commercial agreements



Farmers Market Hertford. Documentary market example; see full source and licence in the credits. Source and licence: pp. 197–199.

Buyer qualification examines identity, authority, trading history, technical requirements and ability to pay. Confirm who is purchasing and whether an agent has authority to act. Use independent verification proportionate to the value and risk of the proposed transaction.

Treat unusual urgency, changed bank details and requests for unexplained fees as issues requiring verification. Keep commercial discussions in authorized channels and protect confidential introductions. A recognizable company name in a message does not establish that the sender represents that company.

- Verify legal entity, contacts and purchasing authority.
- Review credit exposure and payment arrangements with competent advisers.
- Obtain consent before sharing confidential correspondence or personal contacts.

Apply and review

Design a buyer-verification checklist for a first order. Include the evidence needed to verify identity and bank instructions without relying on the same message that introduced the transaction.

Related reference framework: [S09], [S10], [S14], [S15]. See pages 193–196.

Application notes

Convert a specification into a supply commitment

A commercial specification defines what the buyer will accept. It may cover identity, grade, composition, moisture, microbiological or chemical criteria, packaging, labelling and documents. Clarify methods, units and tolerances rather than assuming similar words mean the same thing.

Review the specification with production and technical staff before promising supply. Identify requirements the cluster can already meet, those requiring trials and those outside its capability. Preserve the agreed version with the order. If a buyer changes a requirement, assess cost, timing and technical implications before accepting the change.

- Confirm intended use and which requirements are mandatory.
- Agree sample and commercial-lot acceptance procedures separately.
- Link each requirement to evidence and an internal owner.

Apply and review

Take one buyer specification and create a compliance matrix. Mark each item verified, planned or unresolved, and identify what must be resolved before a binding delivery commitment.

Application notes

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Agree price payment and acceptance together

Price has meaning only with quantity, grade, currency, delivery point, payment timing and acceptance terms. A higher unit price can be offset by extended credit, expensive logistics or broad rejection rights. Evaluate the whole transaction.

Clarify deposits, milestones, invoicing documents, payment due date, deductions and dispute handling. Determine who bears the risk while a buyer evaluates stock. Use professional support for unfamiliar instruments and cross-border payment arrangements. Do not describe a payment promise as secure merely because it appears in a purchase order.

- Separate quotation validity from delivery and payment dates.
- State the basis for adjustments and the evidence required.
- Set a credit limit consistent with the cluster's ability to absorb delay.

Apply and review

Compare two offers with different prices and payment periods. Calculate contribution and cash exposure for each, then explain the information needed to judge which offer is commercially preferable.

Application notes

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Use delivery terms precisely

Delivery terms allocate important transport, cost and risk responsibilities. ICC Incoterms 2020 is a reference for commonly used trade terms. [S09] Use the chosen rule with a named place or port and version. Obtain professional advice on its suitability for the mode and transaction.

Incoterms do not by themselves resolve every issue in a sales contract, such as product quality, title transfer or payment. Those matters need separate agreement. Ensure the logistics quotation reflects the responsibilities actually accepted, including any insurance, customs and unloading obligations relevant to the selected term.

- Name the precise handover point and relevant transport mode.
- Check that staff understand when risk and cost responsibilities change.
- Keep the delivery term consistent across quote, order and shipment documents.

Apply and review

Review a quotation that states only FOB. Identify missing information and the questions to resolve with the buyer and logistics adviser before the cluster prices or accepts the order.

Application notes

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Manage confidentiality and fair producer contracts

Commercial confidentiality protects legitimate information, but it should not hide the rules affecting producers. Explain specifications, fees, deductions, payment and rejection conditions in an understandable agreement. Give farmers time to ask questions and retain copies.

A buyer introduction may be subject to a nondisclosure agreement or other restrictions. Record who may share information and how approval is obtained. Avoid imposing one-sided exclusivity without defining duration, obligations and remedies. FAO contract-farming resources offer useful background; enforceability and appropriate wording require local legal review. [S10]

- Separate confidential buyer data from producer-facing operating conditions.
- Make changes through an agreed notice and acceptance process.
- Provide accessible dispute and exit arrangements.

Apply and review

Review a supplier clause allowing any deduction the buyer requests. Rewrite the commercial principle to require an agreed basis, supporting evidence, notification and a fair dispute route.

Application notes

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Build repeat business from verified performance

Repeat orders depend on consistency, communication and resolution of problems. Keep an account review showing deliveries, quality, claims, payment and open opportunities. Ask the buyer which improvement matters most to future purchasing rather than assuming more volume is always wanted.

Use feedback to improve production and processing. Do not conceal recurring defects or promise a corrective action that has no owner or resources. Diversify carefully while preserving service to existing customers. A relationship is an asset only when the organization can maintain it beyond one person's private contacts.

- Record specification updates and customer decisions centrally.
- Review complaints and corrective actions across functions.
- Agree realistic forecasts without treating them as binding orders.

Apply and review

Prepare a quarterly buyer-review agenda using one completed order. Include evidence of performance, unresolved concerns and a proposed next trial with clearly limited commitments.

Application notes

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CHAPTER 17 | 1 OF 6

Finance investment planning and cash flow



Exterior of a vegetable preparation factory. Documentary example; photograph by Tom Sargent. Source and licence: pp. 197–199.

Revenue is the value of sales. Contribution is revenue less variable costs. Operating profit also deducts relevant fixed operating costs. Cash flow records when money is received and paid. These measures answer different questions and should not be used interchangeably.

A cluster can show a positive contribution and still run out of cash while waiting for the buyer to pay. It can also receive cash from a loan without earning a profit. Build statements that reconcile these differences. All financial figures in this manual's exercises are illustrative USD assumptions, not price quotations, lending offers or investment returns.

- State quantity, saleable grade, unit price and timing explicitly.
- Separate operating, investing and financing cash movements.
- Include unpaid obligations and stock held at period end.

Apply and review

Explain how a profitable order could cause a cash shortage. Draw its payment timeline from input purchase to buyer settlement and identify the largest funding gap.

Related reference framework: [S01]. See pages 193–196.

Application notes

Build unit economics from a saleable kilogram

Unit economics show whether the product makes a contribution under stated conditions. Begin with saleable quantity, not total harvest. Include raw material, processing, packaging, testing, handling, transport and other variable costs within the chosen delivery boundary.

Illustration: 900 kg sold at USD 10 per kg gives USD 9,000 revenue. If batch variable costs are USD 6,300, contribution is USD 2,700, or USD 3 per saleable kilogram. Contribution margin is 30 percent of revenue. Markup on variable cost is approximately 42.9 percent. Fixed costs, financing and taxes are still outside this calculation.

- Avoid allocating the same charge twice through both a service fee and a cost line.
- State whether costs are quoted, estimated or measured.
- Recalculate when recovery, rejection or delivery terms change.

Apply and review

Recalculate the illustration if only 810 kg is saleable at the same price and batch cost. Explain why a production-loss assumption can materially affect the commercial decision.

Application notes

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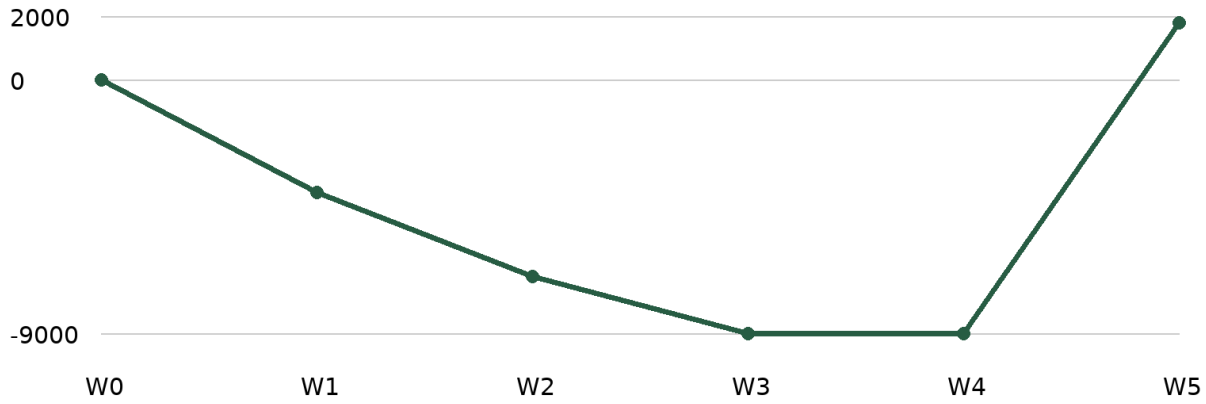
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Model the working capital cycle

Working capital supports the period between paying for operations and collecting customer receipts. Include inputs, labour, processing, stock, transit, inspection and credit periods. Supplier credit or customer deposits may reduce the gap, but only if the arrangements are credible and documented.

Build a weekly or monthly cash schedule for the pilot. Record opening cash, receipts, payments and closing cash. The most negative projected balance indicates the financing gap before any safety reserve. Do not assume a loan is available simply because the spreadsheet requires it. Test delayed payment and lower output separately and together.

- Match payment dates to actual contractual obligations.
- Include debt service and essential reserves in the cash plan.
- Update forecasts with actual receipts and payments frequently.



Illustrative USD cash position before financing

Apply and review

Create an eight-week order cash schedule. Delay the customer receipt by two weeks and identify which payments become unfunded. Propose an operational or contractual response before requesting additional borrowing.

Application notes

Calculate break even with the correct boundary

Break-even quantity covers fixed costs using contribution per unit. It is useful only when price, cost behaviour and capacity assumptions are understood. If contribution is zero or negative, increasing volume does not solve the problem without another change.

Illustration: monthly fixed costs of USD 4,500 and contribution of USD 1.50 per saleable kilogram require 3,000 kg to break even at the operating level. If effective capacity is only 2,400 kg, the design cannot reach that break-even point under the assumptions. Options include improving price or recovery, reducing cost or changing the service model.

- Distinguish accounting break even from cash obligations and debt service.
- Test whether required volume fits effective capacity and buyer demand.
- Separate genuinely fixed costs from costs that step up at higher volume.

Apply and review

Calculate break even if contribution falls to USD 1.20. Explain which assumptions management should investigate before recommending a larger facility.

Application notes

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Stress test the model before seeking capital

A stress test shows how the plan behaves when important assumptions worsen. Select variables that drive the business: saleable output, price, rejection, transport, utilization, exchange rates and payment delay. Use combinations that could occur together rather than only isolated small changes.

Show the effect on contribution, cash gap and ability to meet obligations. Record the actions available under each scenario and their timing. Some responses, such as finding another buyer, cannot be completed after cash has already run out. Avoid presenting a favourable scenario as the expected outcome without evidence.

- Identify the three assumptions with the largest financial effect.
- Establish a downside case and a severe but plausible disruption case.
- Define investment limits and stop conditions before spending.

Apply and review

Reduce output by 20 percent and price by 10 percent in a trial budget while retaining fixed costs. Explain which expenses change, which remain and whether the order still supports the cluster.

Application notes

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Prepare a finance request with evidence

A finance request should state the amount, use, timing, repayment source and risks. Support it with site rights, market evidence, technical design, costs, governance, financial projections and relevant permissions. Distinguish money needed for assets from money needed for operations.

Security over an asset and a credit guarantee can affect a lender's assessment, but neither creates operating cash or proves commercial viability. Obtain professional advice on obligations, fees and enforcement. Do not promise that a public programme or bank will approve a request. Present investor and lender materials consistently with the underlying evidence.

- Reconcile requested funds with the implementation budget and cash schedule.
- Explain sponsor contribution and remaining funding conditions.
- Identify which projections depend on unverified assumptions.

Apply and review

Write a one-page funding summary for a pilot hub. State what will be purchased, why the pilot size is appropriate and what evidence must be achieved before expansion finance is requested.

Application notes

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CHAPTER 18 | 1 OF 6

ESG investors and responsible capital



Climate-smart agriculture training involving women farmers in Nyando, Kenya, 2013. Photo V. Atakos / CCAFS. Source and licence: pp. 197–199.

ESG refers to environmental, social and governance factors relevant to the enterprise and its effects. Investors may examine water, waste, labour, land, communities, biodiversity, conduct and management systems alongside commercial performance. Reporting aspirations is not a substitute for managing actual risks.

Prepare a concise risk-and-opportunity narrative linked to the operating plan. Identify the people accountable and the resources available to address material issues. IFC Performance Standards provide an international reference for managing project risks and impacts, including stakeholder engagement. Their applicability and any lender-specific requirements must be confirmed for the transaction. [S05]

- Describe the operating boundary and affected stakeholders.
- Separate current management controls from proposed improvements.
- Keep commercial and impact claims supported by the same underlying evidence.

Apply and review

Prepare an investor briefing on the three most material ESG issues for your cluster. For each, state the exposure, control, evidence and unresolved action.

Related reference framework: [S05], [S06], [S07]. See pages 193–196.

Application notes

Establish an environmental and social action plan

An action plan converts assessment findings into work. Prioritize issues by seriousness, likelihood and ability to prevent harm. Some concerns must be resolved before operations; others can be managed through staged improvements. Do not bury urgent matters in a long undifferentiated checklist.

For each action, identify the outcome, owner, resources, deadline and verification. Link actions to budget and management review. Completion means the intended control works, not merely that a document was written. Use independent technical review where competence or conflict of interest requires it.

- Record the risk or finding that each action addresses.
- Distinguish immediate containment from permanent correction.
- Escalate overdue material actions to the board or authorized oversight group.

Apply and review

Convert a finding about uncontrolled wastewater into an action plan. Include investigation, interim containment, technical design, permissions, operating responsibility and evidence that the completed system performs as intended.

Application notes

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Protect workers through practical systems

Worker protection requires suitable tasks, training, equipment, supervision, fair treatment and accessible complaint routes. Assess hazards in fields, workshops, stores, vehicles and processing areas. Consider seasonal, contract and informal workers as well as permanent staff.

Use the ILO safety and health code as a reference for agricultural risk management, supplemented by applicable law and competent assessment. [S07] Prioritize removing hazards and improving work design before relying only on protective clothing. Record incidents and near misses, investigate causes and verify changes. Do not reward reporting systems that appear successful only because workers are afraid to report.

- Identify hazardous tasks and authorize trained people to perform them.
- Establish safe isolation and maintenance arrangements for equipment.
- Provide understandable terms, welfare arrangements and escalation routes.

Apply and review

Observe a loading operation and identify risks to workers and bystanders. Propose a change to layout or method that reduces exposure before selecting personal protective equipment.

Application notes

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Measure outcomes with credible boundaries

An impact claim should state what changed, for whom, over what period and against what comparison. Count people, jobs, enterprises, training places and workdays separately. Record negative effects and people excluded from benefits as well as positive results.

Use a baseline and a feasible verification method. Where causation is uncertain, report contribution rather than claiming sole responsibility. Avoid converting general development goals into project achievements. A cluster can align activities with a goal without proving a quantified contribution to national or global outcomes.

- Define indicators, units, sources and collection responsibility.
- Separate outputs, outcomes and longer-term impact.
- Protect privacy when reporting small or vulnerable groups.

Apply and review

Rewrite the statement that the project transformed 1,000 lives. Choose a specific measurable outcome and describe the evidence required, comparison period and limitations of attribution.

Application notes

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Evaluate capital terms and mission effects

Capital can support expansion while changing control, cash obligations and risk allocation. Compare grants, member capital, loans, leasing and equity against the purpose and cash cycle. Each has conditions; apparently free funding can carry reporting and operating commitments.

Review governance rights, security, repayment, fees, covenants, dilution, exit and consequences of default with qualified advisers. Consider how terms affect producer payment and community commitments. Do not accept a financing structure that relies on unverified returns or creates obligations the organization cannot explain to its members.

- Align the duration of finance with the asset and operating cycle.
- Model downside cash obligations before accepting terms.
- Record who can approve commitments and disclose relevant conflicts.

Apply and review

Compare a lease and a loan for the same processing asset using total cash cost, maintenance, ownership and flexibility. State which uncertainties prevent a final decision.

Application notes

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Prepare an honest investment data room

A data room organizes evidence so reviewers can assess the enterprise. Include governance, site rights, permissions, market evidence, technical design, budgets, financial records, risk assessments and action plans. Use a dated index and clear access controls.

Separate final signed documents from drafts. Mark expired, conditional and missing evidence visibly. Limit personal and confidential information to legitimate review needs. Track questions and responses so different reviewers do not receive contradictory explanations. A polished presentation should link to the evidence rather than substitute for it.

- Assign document owners and a review date.
- Maintain one controlled financial model with an assumptions register.
- Preserve a record of significant representations made to investors.

Apply and review

Assemble a ten-item data-room index for a pilot cluster. For each item, identify the owner, current status and whether it can be shared openly, under confidentiality or only after further approval.

Application notes

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Circular bio industry and resource recovery



Build a material flow register

A material flow register records what enters, changes, leaves and remains in the system. Include product, water, packaging, residues and disposal. Use measured quantities where possible and label estimates. Separate wet and dry bases so water removal is not mistaken for missing material.

The register helps identify recovery opportunities and unexplained losses. It should support operational decisions rather than become an elaborate diagram with unverified numbers. Start with the largest or highest-risk streams and improve measurement over time. Link physical balances with stock and financial records.

- Define the boundary, period, unit and measurement method.
- Record destination and responsible recipient for outgoing streams.
- Investigate unexplained balances before assigning revenue.

Apply and review

Map one processing batch into saleable product, retained sample, co-product, wastewater and disposal. Record uncertainty and identify the measurement that would most improve the reliability of the balance.

Application notes

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Assess co products before feed or soil use

Biological residues can contain contaminants, pathogens, unsuitable chemicals or variable nutrient levels. Their suitability depends on source, treatment, intended use and applicable requirements. Do not assume that natural origin or a food-processing source makes material automatically suitable for feed or soil application.

Use competent assessment and relevant testing. Keep incompatible or unassessed streams separate. Maintain identity, handling and destination records. Where a feed or fertilizer product is proposed, confirm the regulatory route and technical specification before marketing it. A failed food lot requires a documented disposition, not automatic diversion into another supply chain.

- Define acceptance criteria for each source and use.
- Control storage conditions and cross-contamination.
- Verify the receiving operation's capability and permitted activity.

Apply and review

Evaluate a proposal to sell press cake as animal feed. Identify questions about source, processing, contaminants, nutrient variability, species suitability and legal requirements that must be resolved first.

Application notes

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Compare recovery routes economically

A recovery route needs enough predictable material and a useful output. Compare capital, operating costs, transport, utilities, quality control and disposal of remaining material. Seasonal availability may make an apparently attractive machine underutilized.

Do not assign a positive sales value to every tonne. A processor may charge to receive material or accept it only under strict conditions. Include the avoided disposal cost where justified, but avoid double counting it with an unrelated revenue estimate. Test the route at pilot scale before committing to a dedicated facility.

- Confirm quantity and quality over representative seasons.
- Obtain evidence of demand and receiving specifications.
- Include the costs of managing unusable fractions.

Apply and review

A residue route earns USD 50 per tonne but costs USD 35 to collect and transport and USD 20 to treat. Calculate its direct contribution and explain how a legitimate avoided-disposal benefit could change the decision.

Application notes

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Match energy solutions to operating demand

Energy planning begins with the load: power, heat, timing, reliability and consequences of interruption. Solar generation, grid power, generators or biomass systems may serve different needs. A generation estimate does not by itself establish reliable processing capacity.

Measure demand and critical loads. Obtain competent engineering advice for sizing, safety, storage, fuel and maintenance. Compare lifecycle cost and service support. Protect operations that must continue during an outage, such as refrigeration or controlled processing. Avoid claims of zero emissions without defining the assessment boundary and evidence.

- Separate electricity demand from process heat demand.
- Include startup loads, downtime and backup requirements.
- Plan safe fuel, battery or equipment maintenance arrangements.

Apply and review

Prepare an energy brief for a drying and packing hub. Identify essential loads, hours of operation, outage tolerance and the data an engineer needs before recommending a system.

Application notes

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Prevent green claims from outrunning evidence

Environmental communication should describe a defined practice and its measured result. Words such as sustainable, regenerative, circular and carbon neutral can imply more than the project has established. Explain the boundary, method, period and limitations of any quantified claim.

A residue sold for a useful purpose may reduce disposal but increase transport. An energy-saving process may produce a lower recovery. Review tradeoffs rather than selecting only the favourable measure. Keep claims consistent across investor materials, labels and the website. Obtain appropriate technical and legal review for regulated claims or tradable environmental credits.

- Retain evidence supporting each public environmental statement.
- Distinguish intentions, actions and verified outcomes.
- Correct misleading wording promptly and preserve the revision history.

Apply and review

Review a statement that the cluster is zero waste. Identify uncounted streams, measurement gaps and disposal routes, then draft a narrower statement the available records can support.

Application notes

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CHAPTER 20 | 1 OF 6

People procurement and enterprise controls



A cassava milling setting. Documentary context, not an example of verified hygienic controls; photograph by Aitokhuehi. Source and licence: pp. 197–199.

A pilot team needs clear responsibility for production coordination, quality, logistics, finance, learning and administration. One person may hold several roles initially, but conflicting responsibilities need safeguards. The person requesting a purchase should not automatically be its sole approver and payment verifier.

Write role descriptions with outputs, authority, reporting and cover during absence. Keep escalation practical. Staff should know who can stop unsafe work, hold product, approve expense and communicate with buyers. Review workload as the cluster grows rather than adding informal responsibilities without resources.

- Assign accountable owners for critical processes and records.
- Identify conflicts that require an independent check.
- Provide training and deputies for essential roles.

Apply and review

Map the pilot's five most consequential decisions to named roles. Identify where one absence or conflict could halt operations and design a proportionate backup arrangement.

Related reference framework: [S06], [S07]. See pages 193–196.

Application notes

Procure against a functional specification

Procurement should start with the service or performance needed. Write the specification before seeking quotations and compare suppliers on a consistent basis. Include delivery, installation, training, consumables, support, spare parts and total operating cost.

Record how quotations were obtained, assessed and approved. Disclose related parties and gifts. For equipment, verify performance using representative material and agreed acceptance tests. Paying for an asset is not the same as accepting it. Keep payment milestones linked to evidence appropriate to the purchase.

- Define the need, budget and authorized decision route.
- Compare like-for-like scope and identify exclusions.
- Preserve receiving, commissioning and warranty records.

Apply and review

Prepare a functional specification for a platform scale. Include capacity, accuracy needs, operating environment, verification, power, service support and evidence required at acceptance.

Application notes

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Control payments and producer settlements

Payment control protects the organization and the people supplying it. Match invoices or settlement statements to approved transactions, quantity, quality decisions and agreed fees. Verify bank-detail changes independently and restrict who can amend supplier records.

Producer settlements should show accepted quantity, price basis, authorized deductions and amount due. Explain discrepancies before payment becomes overdue. Reconcile bank movements with records and investigate unresolved items. Small organizations can use proportionate checks, but personal trust should not be the only control over shared funds.

- Separate preparation, approval and reconciliation where feasible.
- Require supporting evidence for deductions and exceptions.
- Keep a visible schedule of amounts due and overdue.

Apply and review

Review a settlement statement with an unexplained quality deduction. Identify the specification, inspection and approval evidence needed, and draft a clear explanation the producer can understand.

Application notes

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Maintain assets before failure becomes normal

Maintenance protects capacity, safety and product quality. Create an asset register with location, owner, operator, service instructions, maintenance interval and critical spares. Follow competent manufacturer and engineering guidance rather than relying on memory.

Schedule preventive work around production and record completion. Operators should report abnormal noise, heat, vibration, contamination or inconsistent output. Define when equipment must be isolated. Track downtime and recurring faults so replacement or redesign decisions are evidence-based. A maintenance log is useful only when necessary work is funded and performed.

- Identify assets whose failure stops the chain or creates a serious hazard.
- Keep service providers and spare-part lead times current.
- Verify equipment performance before returning it to use.

Apply and review

Select one critical pump or dryer and prepare a maintenance plan. Include daily observations, scheduled service, authorized repair and the evidence required after a fault is corrected.

Application notes

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Use meetings to resolve work

An operating meeting should review evidence, decide action and remove obstacles. Limit reporting to information that supports a decision. Separate daily coordination from strategic review so urgent scheduling does not consume every board meeting.

Use a short agenda covering safety, product status, supply, capacity, deliveries, cash and open actions. Record owner, deadline and completion evidence for each decision. Review overdue actions and explain changes. Avoid repeatedly carrying the same issue forward without deciding whether authority, resources or understanding is missing.

- Circulate essential records before longer review meetings.
- Distinguish information, recommendation and decision items.
- Confirm what staff should do differently after the meeting.

Apply and review

Run a 20-minute operating review for a delayed order. Produce no more than five actions, each with an owner, deadline and evidence that will establish completion.

Application notes

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Control documents and public messages

Document control ensures people use the correct procedure, specification or agreement. Assign a title, identifier, version, owner, approval and review date. Retain obsolete versions for investigation while preventing routine use. Include printed copies and messaging-group attachments in the control plan.

Public messages should be checked against operational evidence. Website copy, recruitment forms and presentations can create expectations about purchasing, training or finance. Establish who approves them and how corrections are communicated. A local team should not invent accreditation, government endorsement or buyer commitments to strengthen promotion.

- Keep one accessible location for approved current documents.
- Define how urgent changes reach staff and participants.
- Record approvals for consequential external claims.

Apply and review

Audit three documents in use at the hub. Compare versions and identify who approved each. Correct any mismatch and explain how users will know which version to follow tomorrow.

Application notes

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CHAPTER 21 | 1 OF 6

Adapting the model across value chains



Women harvesting vegetables. Documentary production example; see full source and licence in the credits. Source and licence: pp. 197–199.

Cereals and pulses can supply cleaned whole products, milled ingredients and further manufactured foods. Start with species, intended use and buyer requirements. Storage, cleaning, sorting, dehulling and milling decisions depend on the product, not merely the availability of a machine.

Keep food and feed routes distinct and assess hazards with competent support. Pulse products requiring cooking or extrusion need validated processes; flour is not automatically ready to eat. Control infestation, moisture and foreign material according to product-specific guidance. Use trials to measure grade distribution and recovery before making purchase commitments.

- Compare whole-product sales with milling using saleable recovery and real demand.
- Verify storage and handling capacity over the harvest peak.
- Preserve lot identity when material is cleaned, split or blended.

Apply and review

Prepare two product briefs from the same pulse crop: cleaned whole pulses and flour. Identify which processing, testing, packaging and customer requirements differ, and which costs cannot be assumed equal.

Related reference framework: [S03], [S13], [S15]. See pages 193–196.

Application notes

Root and fruit chains require timely handling

Roots, tubers and fruits can lead to fresh products, chips, flour, puree, juice or starch. Their value depends on maturity, condition, handling time and the transformation selected. A fresh-market crop and a processing crop may have different quality and harvest requirements.

Use crop-specific technical advice. Cassava, for example, requires appropriate assessment and processing controls; a generic wash-and-dry instruction is insufficient. Fruit processing needs suitable preparation, preservation and shelf-life evidence. Match harvest to cooling or processing capacity and investigate rejected fractions before proposing alternative uses.

- Agree maturity and acceptance criteria with the intended customer.
- Measure recovery from representative material rather than selected samples.
- Separate fresh, dried, cooked and extracted-product control plans.

Apply and review

Compare a fresh mango route with a dried mango route. Map time-sensitive stages, processing recovery, packaging, energy and alternative outlets. Explain why the higher selling price per kilogram may not produce the higher return.

Application notes

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Botanicals require identity and intended use control

Moringa, herbs, spices and aromatic crops can enter food, tea, oil, cosmetic or technical markets. Species, plant part and intended use must be known. Similar appearance or a local common name is not enough for commercial identity.

Keep leaves, seeds, roots and extracts in appropriate separate flows. Obtain buyer specifications and competent assessment of processing, contaminants and permitted claims. Essential oils are not interchangeable with edible seed oils. Avoid health claims and do not assume that traditional use establishes regulatory acceptance in another market. Use drying and extraction trials to define repeatable output.

- Verify botanical identity and source for each lot.
- Keep sampling and laboratory work linked to the intended use.
- Treat new species, plant parts or extraction methods as controlled changes.

Apply and review

Create separate product routes for moringa dried leaf and seed oil. Identify different raw-material supply, equipment, testing, storage and customer qualification needs before combining them in one business plan.

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Cattle pasture. Documentary livestock example; see full source and licence in the credits. Source and licence: pp. 197–199.

Livestock, milk, poultry and eggs require species- and product-specific controls, professional oversight and applicable authorization. Farm health management, welfare, transport and processing affect both market access and product suitability. A crop-processing hub is not automatically capable of handling animal products.

Use authorized slaughter and inspection routes where required. Maintain appropriate chilling, hygienic processing and separation. Dairy products need validated processes and cold-chain management suited to the product. Keep hides and non-food co-products physically and operationally separate from food flows. Do not divert unfit material without an authorized disposition.

- Establish the responsible veterinary, food-safety and regulatory functions.
- Verify premises, equipment and cold-chain capability before contracting supply.
- Preserve source, treatment and product records.

Apply and review

Assess whether an existing crop cluster should add dairy processing. Identify missing competence, facilities, permissions, utilities, testing and sales evidence. Compare building capability with partnering with an established processor.

Application notes

Fish honey and mushrooms have different control points

Fish, honey and cultivated mushrooms can provide enterprise opportunities, but they should not share a generic operating procedure. Fish requires suitable sourcing, rapid handling and preservation. Honey needs appropriate mature-comb harvesting, hygienic extraction and control of its identity and condition. Mushrooms require known edible species, suitable substrates and controlled cultivation.

Use separate technical plans and market specifications. Assess any proposed specialty ingredients or hive products independently. Do not infer safety or legal acceptance from a product's natural origin. Select infrastructure and monitoring according to the most time-sensitive and consequential stages in each chain.

- Define species or material identity and intended use.
- Verify handling, preservation, packaging and release arrangements.
- Measure losses and saleable recovery in representative trials.

Apply and review

Choose one of the three chains and design a pilot transaction. Explain why its critical handling decisions differ from those of a dried grain or fibre business.

Application notes

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Fibre and feed chains need fit for purpose inputs

Fibre businesses may supply clean fibre, yarn inputs, rope, mats or composites. Evaluate separation, cleaning, grading, baling and manufacturing against the customer's functional requirements. Bulky low-value material can be constrained by transport even where biological production is strong.

Feed enterprises require approved and assessed inputs, competent formulation and products suited to species and life stage. Hay, silage, compound feed and specialist ingredients have different production and storage needs. A co-product's nutrient content and hazards can vary. Do not treat all residues as usable feed or provide one ration for every animal.

- Confirm the buyer's specification and legal product category.
- Test recovery, storage stability and delivered cost.
- Keep technical competence and quality checks proportional to intended use.

Apply and review

Compare sale of baled fibre with local rope manufacture, then compare a hay service with compound-feed manufacturing. Identify the additional skills and investment required at each higher transformation stage.

Application notes

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CHAPTER 22 | 1 OF 6

Risk continuity and incident response



Pallet-rack warehouse. Documentary storage example; photograph by Axisadman. Source and licence: pp. 197–199.

A risk register identifies uncertain events, their causes, consequences and controls. It is useful when it changes priorities, budgets or operating rules. Avoid long lists of general concerns without a named owner or response.

Assess likelihood and consequence using a scale the team understands. Consider severe low-frequency events separately from frequent minor problems. Record existing controls and remaining exposure. The risk owner should review whether controls are functioning, not merely whether a document exists. Escalate risks outside the owner's authority.

- Link risks to specific activities and affected stakeholders.
- Define triggers and immediate actions for material events.
- Review after incidents, major changes and new market commitments.

Apply and review

Select five risks that could prevent the next delivery. For each, identify the earliest observable warning, current control and decision required if the warning occurs.

Related reference framework: [S03], [S04], [S06]. See pages 193–196.

Application notes

Prepare for supply and capacity disruption

Supply can fail through weather, disease, labour shortages, input delay or farmer withdrawal. Processing can fail through equipment, utilities or absent expertise. Assess the combination rather than assuming that one backup supplier solves every problem.

Develop alternatives before disruption. Qualify substitute suppliers and processors, agree rescheduling rules and identify safe storage limits. Keep customer communication factual and early. Never replace a specified ingredient or origin without appropriate approval. The continuity plan should protect producer payment and product controls as well as delivery volume.

- Identify services and inputs with no qualified alternative.
- Maintain current contacts, lead times and contingency costs.
- Define which commitments must be reduced when capacity is lost.

Apply and review

Simulate the loss of the main dryer for one week during peak harvest. Calculate affected intake and propose a sequence of decisions covering harvest postponement, toll processing, storage and buyer communication.

Application notes

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Respond to quality and safety incidents

An incident response begins by protecting people and containing potentially affected product. Establish the facts, identify lots and appoint a competent lead. Preserve records and avoid speculative statements. Applicable notification and recall duties require product- and jurisdiction-specific guidance.

Investigate process, source, equipment and distribution records. Determine whether other lots or customers are affected. Document decisions and technical advice. Returning to production requires evidence that the immediate issue is controlled and the cause has been addressed sufficiently. A commercial deadline should not determine whether an unresolved lot is released.

- Stop relevant movement and preserve evidence.
- Coordinate with responsible technical and public authorities as required.
- Verify corrective action and communication effectiveness.

Apply and review

Conduct a tabletop response to a buyer reporting an unexpected contaminant. Identify the first five actions, records needed and information that can be communicated before the investigation is complete.

Application notes

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Maintain operations during data or communication failure

A power, device, connectivity or account failure should not erase product identity or payment obligations. Maintain usable offline forms for essential events and a reconciliation process for later entry. Backups need restoration tests rather than a mere statement that files are saved somewhere.

If unauthorized access is suspected, contain the incident, preserve relevant evidence and obtain appropriate technical support. Follow applicable notification requirements. Avoid using personal messaging accounts as the only location for orders or approvals. Train staff to verify unusual payment instructions through an independent route.

- Keep printed emergency contacts and essential operating procedures.
- Record offline transactions with unique identifiers.
- Reconcile restored systems against physical stock and financial records.

Apply and review

Run a half-day no-internet exercise. Complete reception, product hold, dispatch preparation and a payment request using fallback records. Identify which control fails first and repair it.

Application notes

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Prevent fraud and manage conflicts

Fraud risks can arise in membership fees, weights, stock, procurement, invoices, bank details and public claims. Use proportionate independent checks and transparent records. A conflict of interest may be manageable when disclosed; concealment prevents others from assessing the decision fairly.

Train participants to report concerns without retaliation. Investigate neutrally and preserve evidence. Do not publicly accuse an individual before a fair process establishes facts. Review patterns such as repeated exceptions, unexplained adjustments or suppliers selected without comparison. Correct systemic weaknesses as well as specific misconduct.

- Restrict changes to key records and require review.
- Verify payments and inventory using independent evidence.
- Record related-party transactions and approval safeguards.

Apply and review

Examine a scenario where one employee creates suppliers, approves invoices and reconciles the bank. Propose a practical control arrangement for a small team with limited staff.

Application notes

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Learn from incidents and exercise recovery

An incident review should explain what happened, why controls did not prevent it and how recovery can improve. Distinguish the immediate error from underlying issues such as unclear responsibility, insufficient capacity or unsuitable work design. Avoid a review focused only on blame.

Track actions to verified completion and test the revised process. Record recovery time, cost and effects on farmers, workers and customers. Update risk assessments, training and commercial commitments. Repeated incidents are evidence that the current response is inadequate even if each individual event was closed administratively.

- Preserve a neutral chronology and evidence base.
- Invite the people who performed the work to explain constraints.
- Share relevant lessons without disclosing unnecessary personal information.

Apply and review

Review a missed delivery caused by vehicle breakdown and late escalation. Identify prevention, detection and recovery improvements, then state how a future exercise will test whether those improvements work.

Application notes

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CHAPTER 23 | 1 OF 6

Phased implementation and scaling



Irrigation farming in Nigeria. Documentary example; photograph by Haneef33. Source and licence: pp. 197–199.

Discovery tests whether a cluster should proceed and what problem it should solve. Meet producers, communities, buyers, service providers and public authorities. Gather enough evidence to compare options without implying that consultation guarantees a project.

Produce a short opportunity brief covering demand, resource fit, participants, bottlenecks, risks and indicative economics. Record unknowns and the next evidence needed. Avoid buying equipment during discovery simply to demonstrate momentum. Set a small investigation budget and a clear decision point.

- Verify the market problem and potential product route.
- Assess site and stakeholder constraints early.
- Identify reasons to stop or redesign before committing capital.

Apply and review

Prepare a discovery brief with five evidence questions. Rank them by the cost of being wrong and design a low-cost method to answer the highest-priority question first.

Related reference framework: [S01], [S05]. See pages 193–196.

Application notes

Design a controlled pilot

The pilot translates the chosen opportunity into a limited operating test. Define scope, participants, product, process, buyer route, budget and duration. Agree responsibility and conditions for stopping. Keep the pilot small enough that failure remains manageable and large enough to test the actual constraints.

Plan evidence collection in advance. Measure quantities, recovery, quality, time, cost and settlement. Include training and independent technical review where needed. A pilot that excludes difficult logistics or uses unusually selected material may not support a larger investment decision.

- Set stage gates for technical, commercial and organizational readiness.
- Reserve resources for correcting expected learning issues.
- Separate pilot records from unrelated operations.

Apply and review

Write a pilot plan for one shipment involving ten farmers. Identify the evidence needed to judge whether the result can be repeated and which costs would change at larger scale.

Application notes

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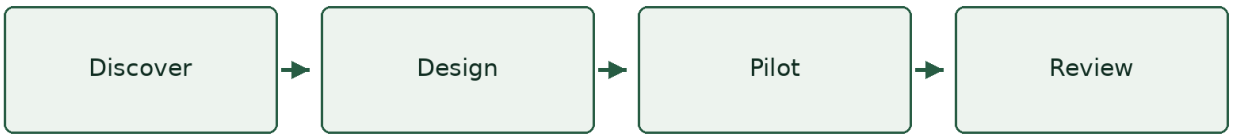
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Use a practical ninety day action schedule

A ninety-day schedule can organize readiness work, but biological cycles and approvals may take longer. Use the period to complete the next justified stage rather than forcing every crop into a three-month commercial launch. Record dependencies and external decisions.

In an illustrative schedule, days 1 to 30 establish scope, market evidence and site checks; days 31 to 60 test records, services and technical capability; days 61 to 90 execute an eligible trial and review results. Adjust timing to actual conditions. Do not harvest or dispatch merely to meet an arbitrary milestone.

- Identify actions that can proceed in parallel and those requiring approval first.
- Assign resources and completion evidence to each milestone.
- Review the schedule weekly against actual progress.



Proceed only when the next stage is supported by evidence

Timing follows crop cycles, capability and required approvals

Apply and review

Build a ninety-day schedule for your cluster using no more than twelve milestones. Mark dependencies and explain which milestone would move if buyer qualification or a required permit is delayed.

Application notes

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Establish commissioning and acceptance gates

Commissioning confirms that facilities, equipment, people and procedures can operate together. Define acceptance criteria before installation or service launch. Include utilities, cleaning, controls, maintenance, training, records and emergency arrangements.

Test with representative material and realistic staffing. Record defects and distinguish those that prevent operation from those that can be corrected under controlled conditions. Supplier demonstration is useful evidence but does not replace the operator's responsibility to verify suitability. Keep final payments and handover tied to agreed acceptance terms where contractually appropriate.

- Confirm required authorizations before commercial operation.
- Verify that operators can perform and explain essential tasks.
- Retain commissioning results and outstanding-action ownership.

Apply and review

Prepare a commissioning checklist for a shared packhouse. Identify the evidence needed for reception, weighing, status control, cleaning, storage, dispatch and incident response before the first paid order.

Application notes

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Scale after repeatable performance

Scaling increases the consequences of weak controls. Require evidence from repeated operations, not one exceptional batch. Assess buyer demand, effective capacity, cash, staffing, traceability and social or environmental effects at the proposed size.

Choose a scaling route deliberately: more utilization, additional shifts, new collection points, contracted capacity or new facilities. Each changes different constraints. Avoid expanding all dimensions simultaneously if management cannot isolate problems. Keep investment modular where uncertainty remains high and maintain a path to pause without abandoning essential obligations.

- Define what performance must be repeated and for how long.
- Recalculate cash and capacity at the new scale.
- Assess effects on communities and existing participants.

Apply and review

Compare increasing utilization of the present hub with building a second hub. Identify which evidence would favour each option and which unresolved issue should block either decision.

Application notes

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Exit or redesign responsibly

A project may need to pause, change product or close when demand, resources or economics do not support continuation. An agreed exit process protects participants better than indefinite promises. Communicate reasons, obligations and next steps clearly.

Account for stock, assets, debts, wages, producer payments, data and contracts. Handle unused land or infrastructure according to agreements and law. Retain records needed for claims or future investigation. Evaluate what can be transferred to another operator or service model without misrepresenting the failed assumptions.

- Define who can authorize pause, redesign or closure.
- Prioritize lawful and contractual obligations to affected people.
- Preserve lessons and communicate realistic alternatives.

Apply and review

Write an exit plan for a pilot whose buyer does not approve commercial supply. Identify what can be recovered, what must be settled and how farmers will be informed without promising an unverified replacement market.

Application notes

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CHAPTER 24 | 1 OF 6

Performance review and continuous learning



A farm extension session in Kenya. Documentary example of shared learning; photograph by Samuel Macharia. Source and licence: pp. 197–199.

A scorecard should support decisions across market, operations, finance, people and resources. Keep it small enough to review consistently. Define each measure, source, reporting period and owner, and show missing or provisional data visibly.

Combine leading indicators with outcomes. Readiness actions, scheduled capacity and overdue tests may warn of problems before a missed delivery. Revenue and rejection show results after the event. Targets should reflect evidence and available resources, not simply desired growth. Explain changes rather than rewarding staff for making every indicator appear favourable.

- Limit indicators to matters with a clear decision consequence.
- Use consistent denominators and avoid double-counting participants or lots.
- Assign corrective action when performance crosses an agreed trigger.

Apply and review

Design a ten-measure scorecard with two measures each for market, operations, finance, people and resources. Identify the record that supports every number.

Related reference framework: [S01], [S02]. See pages 193–196.

Application notes

Measure delivery quality and service reliability

Delivery performance should distinguish quantity, timeliness, completeness and acceptance. A shipment arriving on time may still fail because packaging or documents are wrong. Define the requested delivery window and what counts as a fulfilled order.

Track reasons for misses and assess where in the chain they originated. Compare performance by product, route and service provider without hiding small sample sizes. Record whether a customer accepted a revised schedule before treating a late order as compliant. Use the findings to improve coordination rather than punish the last person handling the product.

- Keep original promises and approved changes distinguishable.
- Report rejection and claims alongside delivered volume.
- Review recurring causes across farm, hub and transport functions.

Apply and review

Calculate accepted-on-time orders for ten scheduled orders, two late deliveries and one rejected on-time delivery. State your denominator and explain how a different definition would change the reported result.

Application notes

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Review inclusion through access voice and returns

Inclusion has several dimensions. People may attend training yet lack influence over decisions or access to paid work. Farmers may deliver more material while receiving a smaller share of value because fees or delays increased. Measure participation, voice and economic returns separately.

Disaggregate carefully where useful and lawful. Avoid publishing small-group information that identifies individuals. Combine records with confidential feedback and examine why participants leave. An inclusive model must address barriers such as distance, timing, language, disability and caring responsibilities through practical design.

- Examine who applies, joins, completes, supplies and receives payment.
- Record complaints and whether responses change decisions.
- Compare benefits with costs borne by different groups.

Apply and review

Review a cohort where women represent half the learners but few paid service providers. Identify the evidence needed to understand the gap before selecting a corrective action.

Application notes

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Evaluate learning through changed practice

Learning outcomes should connect to actual work. Assess whether participants can apply a method, recognize exceptions and explain a decision. Attendance and satisfaction are useful but insufficient evidence of competence or business improvement.

Use practical assessments and follow-up observations. Compare the conditions before and after training while acknowledging other influences. Ask which parts were difficult to use and why. Update content when procedures, markets or technical guidance change. Preserve feedback from participants whose results were less favourable rather than treating them as inconvenient exceptions.

- Define intended practice changes before delivery.
- Gather evidence at assessment and after a suitable interval.
- Revise training based on observed gaps and learner experience.

Apply and review

Evaluate a course on harvest records. Specify the task learners demonstrate, the field evidence collected one month later and the distinction between a record-completion improvement and an income claim.

Application notes

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Conduct an annual integrated review

An annual review considers whether the model remains commercially useful, socially legitimate and operationally capable. Bring together producer feedback, buyer performance, financial results, resource use, incidents, learning and governance. Compare actual performance with the original assumptions.

Identify what should continue, improve, stop or be investigated. Update the strategy and budget together. A change in buyer use, water availability or certification scope may require redesign rather than a minor target adjustment. Communicate the review in language participants can understand and retain a more detailed evidence pack for authorized oversight.

- Review assumptions and material changes, not only target achievement.
- Prioritize a limited set of improvement commitments.
- Assign owners, resources and review dates.

Apply and review

Prepare an annual-review agenda that includes farmers, community representatives, youth, learning staff and commercial functions. Explain which decisions require wider consultation before implementation.

Application notes

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Turn evidence into the next operating cycle

Continuous improvement closes the loop between observation, decision, action and verification. Select changes that address the most important constraints. Test them at an appropriate scale, compare results and retain what works. Document why an approach failed so it is not repeatedly reintroduced without new evidence.

The integrated model becomes stronger when information moves back from markets and processors to production, learning and investment. Keep the system understandable to participants. Technology, logistics and expertise support the relationship; accountable decisions sustain it. The next cycle should begin with revised assumptions and clear commitments rather than a repetition of the launch presentation.

- Select improvements with an expected outcome and measurement method.
- Test without compromising essential product or people protections.
- Standardize successful changes through training and controlled documents.

Apply and review

Choose one improvement for the next cycle. Write its purpose, owner, resources, trial period, evidence and adoption rule. State what result would cause you to abandon or redesign it.

Application notes

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Case 01 Demand is not yet an order

A farmer group receives an email requesting a sample of a dried botanical ingredient. The message mentions a possible annual need of 20 tonnes but contains no approved specification, price, delivery schedule or purchase obligation. Members propose planting immediately because the potential buyer is well known.

The coordinator should verify the counterparty and obtain the current specification. The group can agree a limited sample budget without committing to commercial acreage. The sample record should identify source, species, plant part, preparation and quantity. Any discussion of future volume must remain labelled as indicative until the buyer clarifies its status.

- Decision task: identify which commitments are justified now and which require more evidence.
- Commercial test: establish sample acceptance, supplier approval and order placement as separate stages.
- Communication task: explain to farmers why a sample request is encouraging but does not guarantee purchase.

Apply and review

Draft a message to members describing the next three steps and the spending limit. List the documents needed before a planting expansion is proposed.

Answer guidance. approve investigation and representative sampling, not an unsupported production promise. A useful gate requires written requirements, feasible trials, qualified supply and a credible transaction. A favourable sample result may still leave price, timing and purchase authority unresolved. Record the buyer's actual decision rather than strengthening its wording in recruitment material.

Application notes

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Case 02 A dryer becomes the constraint

Three farms plan to deliver 900 kg of fresh leaves each day. A trial shows that the available dryer processes 300 kg per cycle, including loading, drying, unloading and cleaning. One full cycle takes eight hours. The staffed operating window is sixteen hours, allowing two complete cycles.

Effective intake capacity is therefore 600 kg per day. Harvest exceeds that capacity by 300 kg per day. Over four days, the accumulated excess would be 1,200 kg before any losses. Storage cannot be assumed suitable merely because floor space exists. Holding conditions and permissible time need product-specific technical assessment.

- Decision task: compare staggered harvest, qualified toll processing and another drying shift or asset.
- Evidence task: verify whether sixteen staffed hours are sustainable and whether utilities support both cycles.
- Commercial task: update promised delivery quantities using measured saleable recovery.

Apply and review

Prepare a daily intake schedule that prevents accumulation. Identify the cost and technical evidence required for each alternative.

Answer guidance. coordinate harvest first while assessing alternatives. Do not increase planting to solve a dryer constraint. A higher nominal machine load is not a valid solution until representative trials show acceptable output. Include cleaning and staffing in every comparison. Reassess the bottleneck after any change because milling, testing or packaging may become the next constraint.

Application notes

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Case 03 Sales do not prevent a cash shortage

A pilot order requires USD 4,000 in week one, USD 3,000 in week two and USD 2,000 in week three. The buyer pays USD 11,000 in week five after agreed acceptance. Opening cash is zero and there is no supplier credit or deposit.

The cumulative cash position reaches minus USD 9,000 before the receipt. The order's simple cash surplus after the stated payments is USD 2,000, but this does not fund the earlier gap. It also does not establish accounting profit because depreciation, taxes and other costs have not been specified. If payment moves to week seven, the USD 9,000 gap lasts longer and additional operating obligations may arise.

- Decision task: determine the amount and duration of funding needed.
- Negotiation task: assess a legitimate deposit or staged payment arrangement.
- Protection task: preserve agreed producer and worker payment dates.

Apply and review

Draw the weekly cash curve and add an illustrative USD 300 financing charge. Explain the effect on the final surplus and why borrowing approval cannot be assumed.

Answer guidance. the stated funding gap is USD 9,000 and the stated surplus after that financing charge would be USD 1,700. Confirm all omitted costs and contractual terms before deciding. A profitable-looking sale should be postponed or redesigned if the cluster cannot lawfully and reliably finance fulfilment.

Application notes

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Case 04 One source affects an aggregated lot

Five farmers contribute equal quantities to a 1,000 kg aggregated dry-ingredient lot. The lot is split into 600 kg sent to Buyer A and 400 kg held in the warehouse. After dispatch, a source record reveals that one contributing farmer's material has an unresolved identity concern.

The issue potentially affects the entire aggregated lot because physical separation was lost during pooling. The team should hold the remaining 400 kg and initiate the appropriate incident assessment for the dispatched 600 kg. It cannot assume that only the farmer's 200 kg contribution is affected in a mixture.

- Evidence task: retrieve every contributing lot, mixing record, test and dispatch destination.
- Decision task: appoint the authorized technical lead and follow applicable notification duties.
- Learning task: determine why unresolved material was eligible for pooling.

Apply and review

Account for the full 1,000 kg and draft an initial factual communication to the buyer. Do not speculate about safety before competent assessment.

Answer guidance. containment and traceability come before commercial reassurance. Preserve all records, identify whether other mixtures used the source and document the final disposition. Payment responsibility needs fair contractual and factual review; a manager should not deduct the whole loss from one farmer before the cause and obligations are established.

Application notes

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Case 05 Community water access changes the design

A proposed hub relies on a water point also used by nearby households and livestock owners. The engineering concept includes irrigation and processing, but the assessment has not established seasonal supply, lawful abstraction or the effect on existing users. A local representative has expressed support for the project.

Support does not remove the need to verify rights, resource capacity and impacts. The team should consult affected users, establish technical evidence and investigate alternatives before committing the hub to that supply. The public benefits of a project do not automatically justify transferring its resource costs to non-participants.

- Design task: compare a smaller planting area, improved storage, another source and staged development.
- Governance task: record who can authorize access and how complaints will be handled.
- Budget task: include operation and maintenance for any shared infrastructure.

Apply and review

Prepare a consultation and evidence plan, identifying what can proceed while the water question remains unresolved.

Answer guidance. planning and market investigation can continue, but irreversible water-dependent investment should wait for sufficient evidence and permissions. Establish measurable access arrangements and a response to shortages. Document whose concerns changed the design, including groups that do not become suppliers or employees.

Application notes

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Case 06 A youth service needs enough paying work

A youth enterprise offers field-record and lot-labelling support at USD 40 per completed visit. Travel and consumables cost USD 26 per visit. Monthly fixed costs are USD 280. There are no other stated costs or revenues.

Contribution is USD 14 per visit. Twenty visits cover the stated fixed costs. At twenty-five visits, revenue is USD 1,000, variable cost USD 650 and contribution USD 350, leaving USD 70 before taxes, finance and any omitted costs. A training grant buying equipment does not remove the continuing need for customers and maintenance.

- Market task: verify whether customers will pay for twenty or more visits regularly.
- Operating task: test how distance affects the USD 26 variable cost assumption.
- Inclusion task: provide a fair route for several capable young people to compete or collaborate.

Apply and review

Recalculate the result if travel raises variable cost to USD 30 per visit. Identify an alternative service design that could improve viability.

Answer guidance. contribution becomes USD 10, so break even rises to twenty-eight visits. At twenty-five visits the stated operating result becomes a USD 30 loss. Route consolidation, remote preparation or a revised price may help, but each needs customer and operational testing.

Application notes

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Case 07 A digital course must show competence

A digital-school cohort enrols sixty people. Forty-eight submit all required work and forty demonstrate the published practical competence standard. Twenty participants are later verified as using the method in their work. The remaining participants have not yet been followed up or do not report use.

These figures describe different outcomes. Completion among enrolled learners is 80 percent, demonstrated competence among enrolled learners is about 66.7 percent, and verified application among enrolled learners is about 33.3 percent. None of these measures establishes an income increase without further evidence.

- Evaluation task: investigate barriers between submission, competence and workplace application.
- Access task: assess whether connectivity, language or work scheduling affected results.
- Integrity task: preserve assessment standards while offering support and reassessment.

Apply and review

Draft a public course-results paragraph using the figures accurately. Add two follow-up questions that could improve the next cohort.

Answer guidance. report the period, cohort and evidence methods. Do not count enrolments as graduates or participants as jobs created. Explain missing follow-up and avoid comparing rates with another cohort unless definitions and assessment conditions are comparable. Use the findings to revise support, examples and practice opportunities rather than merely increasing advertising.

Application notes

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Case 08 A buyer changes the delivery specification

The cluster agreed to supply a coarse dried ingredient. Before dispatch, the buyer requests a finer powder, different packaging and an additional laboratory test at the original price and date. The mill has not been assessed for the new particle specification, and packaging must be ordered.

The change affects technical capability, contamination controls, recovery, cost and timing. Commercial staff should request a written change and review it with processing, quality, logistics and finance. The team may offer a revised price or schedule, retain the original specification by agreement or decline the change.

- Technical task: define and test the new output requirement.
- Cost task: estimate milling loss, packing cost, laboratory charge and delay.
- Contract task: obtain clear agreement before altering the product.

Apply and review

Prepare a change-impact note and two commercially reasonable options for the buyer.

Answer guidance. a relationship does not justify silently accepting an unverified process. Record the agreed version and ensure the release reviewer uses it. Explain effects on farmer payment and stock rather than passing unexpected costs backwards without authority. Preserve professional communication while stating the conditions required for reliable supply.

Application notes

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Case 09 A residue is not automatically a profitable product

A proposed co-product generates 20 tonnes of material per month. A potential customer offers USD 50 per tonne. Collection and transport cost USD 35 per tonne, while treatment costs USD 20 per tonne. Fixed cost and testing are not yet included.

Monthly revenue would be USD 1,000. The stated variable costs would be USD 1,100, leaving a negative USD 100 contribution. If the route also avoids a genuine USD 15 per tonne disposal cost that would otherwise be paid, the incremental benefit improves by USD 300, producing USD 200 before omitted costs. This comparison requires consistent boundaries and evidence of the avoided cost.

- Technical task: establish suitability for the proposed use and receiving specification.
- Commercial task: verify repeat demand and all additional costs.
- Environmental task: assess treatment and transport effects rather than assuming circularity is beneficial.

Apply and review

Build the incremental comparison and identify a price or cost change needed for an acceptable margin.

Answer guidance. do not count an avoided cost that was never incurred or is already included elsewhere. Keep food, feed, soil and technical routes separate. A pilot may reveal that a local internal use is preferable to distant sale, or that safe disposal remains the responsible route.

Application notes

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Case 10 The nearest hub is not always the best route

Hub A is 20 km away but requires a seasonal road crossing and often has a four-hour queue. Hub B is 45 km away on a more reliable road with pre-booked intake. A fresh product has a limited handling window established by the technical team. The cluster has not measured actual journey and waiting time.

Distance alone cannot decide the route. Record collection, loading, travel, queue, unloading and acceptance time. Compare product condition and total cost across representative trips. Include wet-season disruption and communication. A collection point may help vehicle utilization while adding another handling stage.

- Evidence task: measure total elapsed time rather than relying on map distance.
- Design task: compare booking, route changes and harvest timing.
- Equity task: assess whether remote farmers are excluded by the chosen arrangement.

Apply and review

Develop a route trial covering both hubs. Define what would make a route unacceptable even if its quoted transport price is lower.

Answer guidance. prioritize reliable product handling and full delivered economics. A route decision should incorporate the value of rejected or downgraded product and the consequences of missed intake. Confirm that any improvement is repeatable and does not merely shift waiting from the hub to unprotected farm storage.

Application notes

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Case 11 An investor asks for impact evidence

A cluster reports 200 training attendances, 80 unique learners, 30 participating farms and 1,500 paid workdays during a year. It proposes advertising 200 trained farmers and 1,500 jobs. The attendance register contains repeat sessions and some learners are not farmers.

The proposed claims are unsupported by the records. Report attendances, unique learners, participating farms and paid workdays separately. Establish completion and competence evidence before using trained as an outcome. Converting workdays into full-time equivalents requires an explicit, suitable convention; it does not change the number of people employed.

- Data task: remove duplicate person counts while retaining session attendance.
- Governance task: approve public claims against evidence.
- Evaluation task: investigate learning application, payment and distribution of benefits.

Apply and review

Write a corrected investor statement and identify the additional data needed to describe employment and learning outcomes credibly.

Answer guidance. publish definitions and limitations. Do not imply causation for every household change. Include adverse effects and unresolved concerns. Investors should be able to reconcile the public statement with underlying records, while individual personal information remains appropriately protected.

Application notes

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Case 12 Expansion requires more than a successful batch

A pilot achieves good quality on one delivery, but the buyer has not confirmed repeat demand. The process used overtime, borrowed transport and a specialist who is not available regularly. The board proposes multiplying planted area by ten.

The result demonstrates a possibility, not yet a repeatable operating system. Reconstruct true costs, staffing, logistics and working capital. Obtain further customer evidence and run additional representative cycles. Assess environmental and community effects at the proposed scale. Expansion could be staged through higher utilization or contracted capacity before new acreage and buildings.

- Gate task: define repeatability, demand and cash criteria before approval.
- Technical task: test normal staffing and realistic input variability.
- Governance task: record the board's assumptions and conditions.

Apply and review

Prepare a scale, pause or redesign recommendation supported by the pilot evidence. Identify the next smallest investment that reduces the most important uncertainty.

Answer guidance. do not discard the positive result, but retain its limits. Approve further evidence gathering or a bounded next stage when justified. A sound decision preserves producer obligations and stops speculative growth from outrunning the organization that must manage it.

Application notes

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Tool 01 Cluster purpose and pilot charter

Use this charter before recruiting suppliers or committing shared funds. Discuss it with the operating team and affected participants. Keep the approved version accessible and record changes. The purpose is to make the first operating commitment small, specific and reviewable.

- Verify that every commitment is within the signatory's authority.
- Attach supporting evidence rather than rewriting unverified claims as facts.

Decision field	What the team must record
Product and use	Name the species or material, product form, grade and intended buyer use.
Pilot boundary	Identify sites, participants, services and activities included or excluded.
Market evidence	Reference the specification, buyer contact and status of demand.
Resources and budget	Record available people, assets, cash and approved spending ceiling.
Accountability	Name the pilot lead, quality authority, finance owner and oversight group.
Gates and stop rules	Define evidence to proceed and events that require a hold or redesign.
Communication	State what farmers and communities have been told and by whom.

Review and approval

Review before launch: can each participant explain the next decision, obligations and limits? Record unresolved issues, owner and target date. Approve only when essential conditions are satisfied.

Application notes

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Tool 02 Value chain opportunity screen

Use one screen for each product route, even when several products come from the same crop. Complete mandatory checks before weighting preferences. Keep rejected options and reasons so future teams understand why they were not selected.

- Score only options that pass essential conditions.
- Identify which uncertain assumption could reverse the selection.

Criterion	Evidence and proposed decision
Customer requirement	Product, intended use, specification and purchasing contact.
Demand status	Confirmed order, qualified forecast, trial request or unverified interest.
Resource fit	Land, water, labour, seasonality and site limitations.
Transformation	Processing steps, available provider and missing technical capability.
Logistics	Collection time, storage, delivery point and practical alternatives.
Economics	Saleable recovery, delivered cost, contribution and cash gap.
Mandatory conditions	Permissions, safety, identity and unresolved fatal constraints.
Decision	Proceed to trial, investigate further, redesign or stop with reasons.

Review and approval

Review with production, quality, logistics and finance. Record dissent and the evidence that would resolve it. A high score must not override an unresolved safety or lawful-access issue.

Application notes

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Tool 03 Stakeholder responsibility map

Use this map to distinguish consultation, contribution and decision authority. Complete it for consequential tasks rather than assigning a general label to an entire organization. Every task should have one accountable owner and a practical escalation route.

- Include farmers, communities, government, youth, schools, investors, buyers and processors where relevant.
- Separate advisory participation from authority to commit resources.

Task	Owner and required coordination
Product commitment	Who accepts buyer quantity, specification, price and timing?
Production readiness	Who assesses farms and verifies corrective actions?
Shared asset access	Who schedules use, sets approved fees and resolves disputes?
Product release	Who can hold and release lots based on evidence?
Producer settlement	Who prepares, approves and reconciles payment?
Community concerns	Who receives concerns and who reviews complaints independently?
Learning outcomes	Who designs, assesses and updates the training?
Public reporting	Who checks operational and impact claims before publication?

Review and approval

Test the map against a late shipment with a pending laboratory result. Record the person who decides, the functions consulted and the people informed.

Application notes

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Tool 04 Farmer readiness assessment

Use this assessment during a site visit with the farmer's informed participation. It evaluates readiness for a particular product route, not the worth of the farmer. Explain fees and supply conditions separately and provide an understandable copy of the findings.

- Distinguish observed evidence from information still awaiting verification.
- Keep material findings visible until reassessed.

Assessment item	Observation and evidence
Farmer and site	Stable identifier, responsible person, location and visit date.
Access and history	Authority to use the site, past activities and unresolved claims.
Water and soil	Assessment, sampling records, interpretation and limitations.
Production capability	Planting material, labour, equipment, field plan and experience.
Hygiene and records	Containers, storage, input records and harvest identification.
Market alignment	Intended product and ability to meet the current specification.
Corrective actions	Required changes, support, owner and reassessment date.
Readiness decision	Ready, conditional or not yet ready with recorded reasons.

Review and approval

Ask the farmer to explain the result and next steps in their own words. Record any disagreement and the review route without making a guaranteed-purchase promise.

Application notes

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Tool 05 Community engagement and grievance record

Use the record for a specific engagement or concern. Keep personal information proportionate and protected. Public summaries can describe themes and actions without exposing the identity of a complainant or vulnerable household.

- Avoid promising confidentiality beyond lawful and practical limits.
- Protect access to the mechanism from retaliation or unofficial charges.

Record item	Information needed
Reference and date	Meeting or case identifier and the person receiving the information.
Affected group	Who uses or depends on the land, water, road or service concerned?
Issue and evidence	Describe the concern neutrally and distinguish verified facts.
Participation method	Language, accessibility, separate discussions and representation.
Response and owner	Proposed action, authority, resources and expected timing.
Referral or escalation	Identify urgent concerns requiring specialist or external action.
Outcome and remedy	Record what was done and whether the affected person was informed.
Follow-up	Evidence of effectiveness, unresolved disagreement and next review.

Review and approval

Review repeated concerns for a systemic cause. Record whether the project design, service rule or communication needs to change.

Application notes

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Tool 06 Permissions and institutional register

Use this register with competent local advice before an activity starts. Requirements vary by jurisdiction, product, location and scale. The register records verified questions and decisions; it does not itself authorize an activity.

- Preserve official responses and exact scope.
- Identify activities that must wait for a required decision.

Activity or requirement	Responsible office and evidence
Entity and premises	Registration, land use, buildings and operating-site requirements.
Land and water	Rights, abstraction, access and applicable resource conditions.
Product and process	Food, feed, botanical, veterinary or other product-specific requirements.
Environment and waste	Assessment, discharge, storage and disposal conditions.
Workers and learning	Labour, safety, school participation and safeguarding arrangements.
Trade documents	Importing-market and shipment-specific requirements.
Status and validity	Application, decision, conditions, expiry and renewal lead time.
Internal owner	Person responsible for evidence, action and monitoring changes.

Review and approval

Review the register before commissioning, product changes and new markets. Record the adviser or authority consulted and the date on which the requirement was last verified.

Application notes

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Tool 07 Youth enterprise pilot canvas

Use this canvas to test a real service opportunity before financing equipment. Complete it with prospective customers and the young enterprise team. Avoid counting a training place as a business unless a viable operating route has been demonstrated.

- Record actual time and non-billable work during trials.
- Explain ownership of assets and customer information.

Enterprise element	Pilot evidence
Customer problem	A specific task causing cost, delay or unreliable quality.
Service output	The result a customer can inspect and accept.
Customer commitment	Trial booking, payment basis and repeat-demand evidence.
Competence	Practical skills, supervision and assessment required.
Resources	Equipment, travel, consumables, administration and access arrangements.
Unit economics	Price, variable cost, contribution and fixed-cost recovery.
Risk and fairness	Selection, payment, safeguarding and complaint arrangements.
Next gate	Evidence needed to continue, change or stop the pilot.

Review and approval

Review after the first ten jobs or another suitable pilot period. Compare forecast and actual cost, customer acceptance and repeat orders before proposing a larger investment.

Application notes

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Tool 08 Digital school lesson and assessment plan

Use this plan to connect a lesson to practical competence. Design for the participant's device, language, connectivity and work setting. State whether any certificate records internal completion or an externally recognized qualification supported by evidence.

- Test the lesson with a learner using limited connectivity.
- Keep assessment independent of pressure to increase enrolment numbers.

Learning element	Required design decision
Task and audience	Who must perform what action and under which conditions?
Prerequisites	Knowledge, literacy, tools and access needed before the lesson.
Teaching material	Short explanations, examples, demonstrations and accessible alternatives.
Practice	A field or business task with usable feedback.
Assessment evidence	Demonstration, record, explanation or decision required.
Criteria	Observable pass requirements and critical errors.
Support and appeal	Help, reassessment, reasonable adjustment and review route.
Follow-up	Evidence that the skill is used after training.

Review and approval

Ask another assessor to apply the criteria to the same sample work. Resolve disagreement and revise unclear criteria before using the assessment for consequential decisions.

Application notes

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Tool 09 Data dictionary and access plan

Use a data dictionary before buying software or publishing dashboards. Define each record consistently and keep access aligned with legitimate responsibilities. The same quantity should not change meaning between a field form and a management report.

- Label measured, estimated, forecast and missing values separately.
- Protect personal data from unnecessary commercial disclosure.

Data element	Definition to complete
Record and identifier	Entity or event represented and stable unique code.
Field name	Clear label and plain-language meaning.
Unit and basis	Kilograms, hectares, dates, currency and fresh or dry basis.
Permitted values	Categories, status meaning and validation rules.
Source and owner	Who observes, enters, checks and corrects the information?
Access	Who may view, change, export or publish it and why?
Retention and backup	Applicable requirements, storage period and restoration method.
Reporting use	Decision or indicator supported and consequence of error.

Review and approval

Test ten records for duplicates, missing units and impossible dates. Document corrections and explain which decisions or published indicators are affected.

Application notes

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Tool 10 Resource and climate readiness sheet

Use this sheet to translate resource evidence into design limits. Complete it with competent site and technical input. Mark proposed thresholds for review rather than presenting them as validated crop prescriptions.

- Distinguish absolute resource limits from efficiency ratios.
- Keep contingency and maintenance requirements in the budget.

Resource item	Evidence and action
Site zones	Soil variation, slope, drainage, access and sensitive areas.
Reliable water	Seasonal source capacity, quality, rights and storage.
Demand budget	Crop, processing, cleaning and other needs with units and period.
Soil plan	Sampling, interpretation, amendments and monitoring.
Climate exposure	Drought, flood, heat, wind and transport disruption.
Trigger and response	Locally verified warning and authorized action.
Community effects	Existing resource users and agreed access protections.
Review	Owner, unresolved questions and next verification date.

Review and approval

Reconcile daily water demand and reliable supply before approving planted area. Record any restriction, alternative source or staged development needed to keep the plan credible.

Application notes

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Tool 11 Harvest and reception record

Use the record to connect field preparation, harvest and receiving decisions. A copy or accessible receipt should be available to the supplier. Keep units and fresh or dry basis explicit throughout the chain.

- Check labels before material is mixed or unloaded into common storage.
- Preserve evidence for disputed quantities or deductions.

Event field	Entry and verification
Origin	Farmer, site, field, product identity and source lot.
Harvest	Date, time, responsible team and estimated quantity.
Handling	Containers, hygiene checks and any observed concern.
Transport	Vehicle, collection, destination and expected arrival.
Weight	Scale identifier, gross, tare and net quantity where applicable.
Reception status	Accepted, held or rejected quantity and reasons.
Resulting lot	New identifier and links to contributing records.
Acknowledgement	Supplier receipt, receiver and dispute notes.

Review and approval

At the end of the day, reconcile planned harvest, delivered quantity, accepted intake and remaining material. Investigate differences rather than correcting them without explanation.

Application notes

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Tool 12 Processing trial and capacity sheet

Use this sheet for representative trials before equipment purchase or commercial reliance. Record the entire operating cycle, including loading, cleaning, changeovers and verification. Keep trial product separate from released stock.

- Use competent technical review for process suitability and safety.
- Compare observed effective output with supplier-rated capacity.

Trial field	Measurement or decision
Purpose	Product, intended use and question the trial must answer.
Input	Identity, source, quantity, condition and preparation.
Equipment	Model, operator, utilities and relevant settings.
Cycle	Start, load, process, unload, clean and downtime observations.
Output	Intermediate, saleable, rejected and co-product quantities.
Quality	Acceptance methods, results and unresolved technical issues.
Cost	Labour, energy, consumables, service and waste handling.
Conclusion	Repeat, revise, adopt or stop with supporting evidence.

Review and approval

Repeat the trial under normal staffing and representative variability. Record whether the result remains acceptable and what limits should be placed on commercial scheduling.

Application notes

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Tool 13 Product specification and release checklist

Use one controlled specification for each product and intended use. Technical acceptance criteria need competent development and applicable market review. The release decision must refer to a defined lot and the agreed specification version.

- Prevent held stock from moving through the released-product route.
- Investigate mismatches between product labels and reports.

Release item	Evidence to verify
Identity and use	Species, plant part or material, product form and intended application.
Quality criteria	Grade, appearance, physical attributes and required methods.
Safety and compliance	Product-specific requirements and competent review.
Lot evidence	Source, process, quantity and exception records.
Testing	Sampling identity, laboratory report, method and interpretation.
Packaging	Materials, labels, lot code, quantity and customer requirements.
Status decision	Hold, release, rework, return or disposal with authority.
Approval	Reviewer, date, scope and links to supporting evidence.

Review and approval

Conduct a mock release using an intentional record discrepancy. Record the hold, investigation and evidence required before any authorized release.

Application notes

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Tool 14 Lot transformation and mock recall log

Use the log to preserve links when material is combined, split or transformed. Test it with a finished product and actual stock records. A successful trace should account for quantities as well as names.

- Do not erase source links when assigning a new batch code.
- Treat missing or uncertain quantities as an investigation issue.

Trace element	Record required
Incoming lots	Identifier, source, product, status and quantity.
Transformation	Date, operator, equipment and activity performed.
Resulting lots	Output identifiers, quantities and condition.
Other streams	Samples, co-products, rejected material and documented loss.
Stock location	Quantity held and current status.
Dispatch	Customer, date, quantity and delivery reference.
Retrieval test	Start time, records found, gaps and quantity accounted for.
Corrective action	Owner, deadline and repeat-test evidence.

Review and approval

Reconstruct one parent lot and all its outputs. Calculate the proportion accounted for, explain legitimate conversion and record any unexplained balance before closing the exercise.

Application notes

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Tool 15 Logistics booking and handover sheet

Use this sheet to agree the movement before product is released to a transporter. Adapt conditions and monitoring to the product. Retain a record at collection and delivery so responsibility can be investigated fairly.

- Check documentation against the actual loaded stock.
- Record deviations immediately while evidence remains available.

Movement item	Agreed information
Shipment	Order, product, lots, packages and weight basis.
Route	Collection points, destination, timing and access constraints.
Vehicle	Suitability, cleaning, load protection and inspection.
Conditions	Product-specific handling and monitoring requirements.
Responsibility	Named contacts and authority at each handover.
Exceptions	Delay, breakdown, damage, excursion and escalation procedure.
Delivery evidence	Receipt, quantity, condition and reservations.
Commercial record	Cost, delivery term, invoice and claim reference.

Review and approval

Review the completed trip with the provider. Compare promised and actual timing, condition and cost, and identify whether a repeated failure requires rescheduling, corrective action or another qualified provider.

Application notes

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Tool 16 Buyer qualification and order review

Use this review before accepting material commercial exposure. Verify identity and authority independently where appropriate. Separate an expression of interest, supplier qualification, forecast and binding order in the records.

- Confirm that the organization can fulfil every accepted obligation.
- Verify bank-detail changes through an independent authorized channel.

Commercial item	Verification needed
Counterparty	Legal entity, authorized contact and independent verification.
Product	Intended use, specification version and sample status.
Quantity and timing	Order size, delivery window and forecast status.
Price basis	Currency, grade, named delivery point and included costs.
Payment	Due date, documents, deposit, credit exposure and verification.
Acceptance and claims	Inspection period, rejection grounds and evidence.
Confidentiality	Information-sharing limits and approval route.
Internal approval	Technical, logistics, finance and authorized signatory decisions.

Review and approval

Prepare a brief recommending acceptance, negotiation or decline. Identify unresolved matters and state which one would prevent a binding commitment.

Application notes

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Tool 17 Unit economics and cash forecast

Use the tool for a defined product and delivery boundary. All example values should be labelled illustrative until replaced with verified quotations or actual results. Maintain one controlled model and record changes to assumptions.

- Separate capital, financing and operating movements.
- Reconcile model totals and retain actual-to-forecast comparisons.

Financial item	Quantity or evidence
Saleable output	Input, recovery, rejection and resulting quantity.
Revenue	Saleable quantity multiplied by price on the agreed basis.
Variable costs	Raw material, processing, packaging, tests and delivered services.
Contribution	Revenue less variable costs; show per unit and percentage.
Fixed obligations	Staff, rent, services, maintenance and other period costs.
Cash timing	Weekly or monthly receipts, payments and opening balance.
Funding gap	Lowest forecast cash position and contingency requirement.
Sensitivity	Lower output, lower price, delays and higher-cost scenarios.

Review and approval

Explain the model to a producer representative without using only financial jargon. Record the assumptions they challenge and the evidence needed to resolve them.

Application notes

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Tool 18 Environmental and social action register

Use this register to turn material findings into verified changes. Align it with applicable law, technical advice and any financing requirements. A completed document is not evidence that a control works.

- Separate commitments already funded from proposals needing approval.
- Escalate material overdue actions to authorized oversight.

Action item	Required entry
Risk or finding	Activity, affected people or environment and supporting evidence.
Priority	Seriousness, likelihood and reason for urgency.
Interim control	Immediate containment while the permanent response is developed.
Permanent action	Specific operational or design change needed.
Resources	Budget, competence, equipment and external support.
Accountability	Owner, authority, deadline and escalation route.
Verification	Evidence and reviewer confirming effectiveness.
Communication	Who needs to know the outcome and how privacy is protected.

Review and approval

Select one action and ask an independent reviewer to assess its evidence. Record whether the risk is controlled, partly controlled or unresolved and what must happen next.

Application notes

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Tool 19 Co product feasibility screen

Use this screen before recording co-product revenue or marketing a recovered material. Suitability depends on source, treatment, use, law and demand. Keep unassessed material separate from approved streams.

- Confirm the regulatory route before product claims are made.
- Link outputs to the input mass balance.

Feasibility item	Evidence required
Material identity	Source, composition, variability and quantity basis.
Intended use	Food, feed, soil, energy, fibre or other specified application.
Hazards and controls	Competent assessment, testing and handling requirements.
Customer	Receiving specification, acceptance and repeat-demand evidence.
Process	Collection, treatment, storage and unusable remainder.
Economics	Revenue, costs, avoided costs and no double counting.
Environmental effects	Transport, resource use, emissions and disposal tradeoffs.
Decision	Trial, internal use, sale, further assessment or safe disposal.

Review and approval

Compare the preferred route with the realistic alternative. Record why the chosen option is better under the stated assumptions and what evidence could reverse the decision.

Application notes

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Tool 20 Procurement and asset acceptance

Use this record to show why a purchase was made and whether the delivered asset performs as agreed. Include total operating cost and support. Keep related-party interests visible before a selection decision.

- Distinguish payment, receipt and technical acceptance.
- Link milestones to the agreed contract and evidence.

Procurement item	Required record
Need	Functional output, users and alternatives considered.
Specification	Capacity basis, environment, utilities and acceptance tests.
Budget	Approved ceiling, funding source and ongoing obligations.
Supplier comparison	Comparable scope, exclusions, support and service evidence.
Conflict review	Relationships, gifts and independent decision safeguards.
Delivery and installation	Condition, completion, training and outstanding defects.
Acceptance	Representative tests, results and authorized approval.
Asset control	Owner, location, maintenance, warranty and critical spares.

Review and approval

Reconstruct one equipment purchase from request to commissioning. Identify missing approvals or performance evidence and assign corrective action before relying on the asset for a major order.

Application notes

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Tool 21 Commodity adaptation worksheet

Use this worksheet when adding a crop, species, plant part or product form. Existing controls should be reviewed rather than copied automatically. New markets or uses can change the requirements even when the raw material is familiar.

- Keep food, feed, technical and other use categories distinguishable.
- Test representative material before assigning commercial yields.

Adaptation item	Product-specific decision
Identity	Species, variety where relevant, plant part or animal product.
Intended use	Customer application and legal product category.
Source and production	Site suitability, health or crop controls and seasonality.
Handling	Harvest, reception, storage and time-sensitive stages.
Transformation	Required process, competence, utilities and validation.
Release	Specification, sampling, testing and authorized decision.
Commercial fit	Recovery, cost, demand, logistics and cash timing.
Change approval	Responsible reviewers, evidence gaps and pilot scope.

Review and approval

Compare the proposed addition with an existing product. Identify the three differences most likely to invalidate a copied procedure or financial assumption.

Application notes

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Tool 22 Incident and continuity response record

Use this record during an exercise or actual disruption. Mark drills clearly. Protect people, contain product and preserve facts before assigning blame. Seek competent technical and legal input where the incident requires it.

- Track quantities and decisions as the incident develops.
- Keep confidential personal information out of general updates.

Response item	Information and action
Event	Date, location, reporter and verified facts.
Scope	People, lots, assets, customers and obligations potentially affected.
Containment	Immediate action, authority and evidence preserved.
Coordination	Incident lead, specialists and relevant external contacts.
Communication	Factual messages, approvals and applicable notification duties.
Recovery	Conditions for safe and reliable resumption.
Investigation	Cause, failed controls and remaining uncertainty.
Improvement	Owner, deadline, verification and revised training or procedures.

Review and approval

Close the record only after actions are verified. State what the team will test in the next exercise and how it will know the revised response is more effective.

Application notes

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Tool 23 Stage gate and scale decision

Use this tool at discovery, pilot, commissioning and expansion decisions. Record evidence against conditions set before the review. Avoid changing the criteria solely because the result is commercially inconvenient.

- State conditions, owners, resources and deadlines explicitly.
- Preserve dissent and unresolved evidence in the review record.

Gate area	Evidence and decision
Demand	Current specification, buyer qualification and credible next order.
Technical capability	Representative process results and effective capacity.
Supply	Readiness, reliability, traceability and realistic production assumptions.
Finance	Actual costs, cash gap, obligations and downside capacity.
People and governance	Competence, authority, representation and open concerns.
Permissions and resources	Applicable approvals, rights, water, utilities and safeguards.
Performance	Repeated results, incidents, claims and corrective actions.
Decision	Proceed, proceed with conditions, pause, redesign or exit.

Review and approval

Identify the smallest justified next commitment. Explain why the proposed scale is supported and what event would require the organization to revisit the decision.

Application notes

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Tool 24 Scorecard and improvement cycle

Use the scorecard to make operating decisions, not only to decorate a report. Choose a manageable number of indicators and retain their definitions. Targets and warning triggers must reflect actual capability and consequences.

- Keep financial, quality, people and resource measures visible together.
- Investigate inconsistent figures before publishing them.

Indicator field	Definition and record
Measure	Clear name and decision it supports.
Formula	Numerator, denominator, unit and reporting period.
Source	Record, collection method, completeness and owner.
Status	Actual, provisional, estimated, forecast or missing.
Comparison	Baseline, previous period or approved target.
Interpretation	Cause, context and uncertainty behind a change.
Action	Owner, resources, deadline and intended result.
Verification	Evidence showing whether the action worked.

Review and approval

Select one adverse result and develop an improvement experiment. Define the trial boundary, expected benefit, possible harm, measurement and rule for adopting or abandoning the change.

Application notes

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Glossary model and organization

ABC. Agriculture Based Cluster: a coordinated arrangement linking producers, enterprises and shared services around a defined product and market route.

RUAIPP. Rural and Urban Agriculture Innovative Production Program; the FPI programme context used in this manual.

ASI. Agriculture Systems Integration; the practical connection of production, processing, markets, logistics, finance and learning.

Anchor product. The initial product route around which a cluster organizes capability, demand evidence and shared services.

Catchment. The practical service area of a hub, assessed through access, journey time, product requirements and cost.

Charter. An agreed statement of purpose, participation, authority, conduct and review arrangements.

Accountable owner. The person responsible for a decision and its evidence, even where others contribute to the work.

Cooperative. A member-owned enterprise arrangement with governance rights defined by its constitution and applicable law.

Shared service. A defined service used by several participants, with scope, provider, access, price and performance arrangements.

Stage gate. A decision point at which evidence is compared with conditions for proceeding, changing, pausing or stopping.

Pilot. A bounded operating test designed to generate representative evidence before larger commitments.

Toll processing. Contracted transformation using another operator's equipment and service under agreed responsibilities.

Glossary production quality and trade

Lot. An identified quantity treated as a unit for specified handling, control or tracing purposes.

Traceability. The ability to follow product identity and relevant events through sourcing, transformation and distribution records.

Mass balance. A reconciliation of inputs, outputs, stock and documented conversion or loss within a defined boundary.

Specification. An agreed description of product requirements and the methods used to assess them.

Validation. Evidence that a proposed control or process is capable of achieving the intended result under defined conditions.

Verification. Checking that an activity or control has been performed and is operating as intended.

Product release. An authorized documented decision that a defined lot meets requirements for its next use or customer.

Nonconformity. Failure to meet a requirement, or an identified gap that prevents acceptance until resolved.

Rework. An authorized additional operation on material, retaining identity and meeting defined technical and commercial conditions.

Cold chain. A controlled sequence of temperature-sensitive handling, storage and transport appropriate to the product.

Phytosanitary certificate. An official plant-health document issued through the responsible authority when required for a specific trade route.

Certification scope. The defined operator, site, product, process and validity covered by an assessment and certificate.

Glossary finance resources and risk

Revenue. The value of sales on a stated quantity, price, currency and accounting basis.

Variable cost. A cost that changes with the volume or activity within the relevant operating range.

Contribution. Revenue less the stated variable costs; it remains available to meet fixed and other obligations.

Contribution margin. Contribution divided by revenue, expressed as a percentage.

Markup. The increase above a stated cost basis, divided by that cost basis; it differs from margin.

Working capital. Resources supporting the timing gap between operating payments and collections.

Cash gap. The funding shortfall indicated by a forecast cash position before financing or an agreed reserve.

Break even. The quantity or revenue at which the defined contribution covers the defined fixed costs.

Sensitivity analysis. Testing how results change when an uncertain input changes.

Concentration risk. Dependence on a limited number of buyers, products, services, sources or routes.

Co-product. A separately assessed useful output with a defined use, quality requirements and lawful destination.

ESG. Environmental, social and governance factors relevant to an enterprise, its risks and its effects.

Glossary learning data and review

Learning outcome. An observable action or decision a learner should be able to perform under specified conditions.

Competence. Demonstrated ability to perform an intended task to an established standard.

Digital school. A learning arrangement combining digital content with suitable practice, support and assessment.

Data dictionary. A controlled definition of records, fields, units, values, ownership and use.

Measured value. An observation produced by an identified measurement method, with relevant limitations.

Forecast. A conditional estimate of a future result, distinct from a measurement or guarantee.

Baseline. A defined starting observation used for a later comparison.

Output. An activity result such as delivered training, processed quantity or completed service.

Outcome. A resulting change in practice, capability or condition, requiring evidence beyond activity counts.

Impact. A longer-term effect whose attribution requires careful assessment of other influences.

Grievance mechanism. An accessible process for receiving, reviewing and responding to concerns with appropriate protection.

Corrective action. A response addressing the cause of a failure, with an owner and evidence of effectiveness.

References 1

Primary and authoritative reference entry points. Accessed 21 October 2026. Confirm the current applicable text before use. External institutions do not endorse this manual.

[S01] Neven D and FAO 2014

Developing Sustainable Food Value Chains Guiding Principles

Background for value-chain thinking and the relationship between commercial, social and environmental performance. Used as a conceptual reference, not as evidence that the FPI design has achieved particular results.

Open the official source

[S02] FAO Resource collection

Global Farmer Field School Platform Publications

Entry point to field-school guidance and monitoring, evaluation and learning resources. Supports participatory learning design; it does not imply endorsement or accreditation of FPI courses.

Open the official source

[S03] FAO and WHO Codex Alimentarius 2023 publication revised 2022

General Principles of Food Hygiene CXC 1 1969

International food-hygiene reference. Product-specific hazard analysis, validation and applicable legal requirements must be established by competent teams. The manual supplies management guidance rather than a complete food-safety plan.

Open the official source

[S04] GS1 Current standard resource

GS1 Global Traceability Standard

Reference for traceability across organizations. Consult the current standard and relevant commodity guidance when designing identifiers, event records and information exchange.

Open the official source

References 2

Primary and authoritative reference entry points. Accessed 21 October 2026. Confirm the current applicable text before use. External institutions do not endorse this manual.

[S05] International Finance Corporation 2012 standards resource

Performance Standards on Environmental and Social Sustainability

Reference for environmental and social risk management. The source page notes an update of the Sustainability Framework; confirm applicable versions and financing requirements before use.

Open the official source

[S06] OECD and FAO 2016

OECD FAO Guidance for Responsible Agricultural Supply Chains

Responsible business conduct and risk-based due diligence reference. Supports the manual's emphasis on evidence, stakeholder effects, accountability and remedy.

Open the official source

[S07] International Labour Organization 2011

Safety and Health in Agriculture Code of Practice

Reference for agricultural workplace risk management. Apply competent task assessment and current national requirements; the manual does not set equipment-specific safe operating limits.

Open the official source

[S08] FAO 2013

Climate Smart Agriculture Sourcebook

Planning reference for climate-responsive agriculture. Site conditions, forecasts, rights and resource evidence determine local actions. No regional yield or climate forecast is inferred from this source.

Open the official source

References 3

Primary and authoritative reference entry points. Accessed 21 October 2026. Confirm the current applicable text before use. External institutions do not endorse this manual.

[S09] International Chamber of Commerce 2020

Incoterms 2020

Official entry point for delivery-rule information. Use the selected rule, named place and version with qualified commercial support. Payment, title and product requirements need separate contractual agreement.

Open the official source

[S10] FAO with UNIDROIT and IFAD resources Resource centre

Contract Farming Learning Centre

Entry point to contract-farming guidance, including the 2015 legal guide. Local professional review is necessary for enforceability, rights, remedies and the chosen business structure.

Open the official source

[S11] FAO 2012 guidelines resource

Voluntary Guidelines on Responsible Governance of Tenure

Reference for responsible tenure governance. Supports attention to affected users, rights and access; national law and competent authorities determine applicable decisions.

Open the official source

[S12] International Labour Organization 2002

Promotion of Cooperatives Recommendation No 193

International reference on cooperative principles and promotion. Registration, voting, member rights and duties must follow the constitution and applicable jurisdiction.

Open the official source

References 4

Primary and authoritative reference entry points. Accessed 21 October 2026. Confirm the current applicable text before use. External institutions do not endorse this manual.

[S13] FAO Thematic resource

Bioeconomy for Sustainable Food and Agriculture

Background on biological-resource approaches. Individual co-product uses still require technical suitability, lawful handling, market evidence and assessment of environmental tradeoffs.

Open the official source

[S14] IPPC Secretariat ISPM 12 adopted 2022

Phytosanitary Certificates

Official standard entry point for preparation and issuance of phytosanitary certificates. Whether a shipment requires particular plant-health documents must be confirmed for its commodity, origin and destination.

Open the official source

[S15] World Trade Organization Official topic resource

Sanitary and Phytosanitary Measures

Reference to the international framework for food safety and animal and plant health measures. It is not a country-specific import permit, buyer approval or exemption from destination requirements.

Open the official source

[S16] FAO Digital services resource

FAO Digital Services Portfolio

Example of digital-service approaches for agriculture and inclusion. Used as background; the manual's proposed systems are not represented as linked to or endorsed by this platform.

Open the official source

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FARMERS PRIDE INTERNATIONAL

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