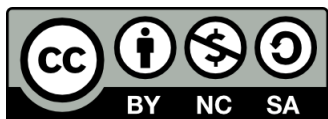


GUIDE

FOR PROFITABLE ADMINISTRATION OF COFFEE SEED AND NURSERY BUSINESSES





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ABOUT THE GUIDE

The production of coffee seeds and seedlings is the initial phase of coffee growing, and it is critical in ensuring the success of coffee farms. Worldwide, there are significant deficiencies in the materials that are delivered to producers, mostly related to poor management of agricultural practices.

World Coffee Research (WCR), in collaboration with various organizations, has published technical guides on best agricultural practices for seed production and coffee nursery management. (available at: <https://worldcoffeeresearch.org/guias>) However, to maximize their effectiveness, these best practices must be accompanied by a culture of business administration in order to guarantee the profitability of the business.

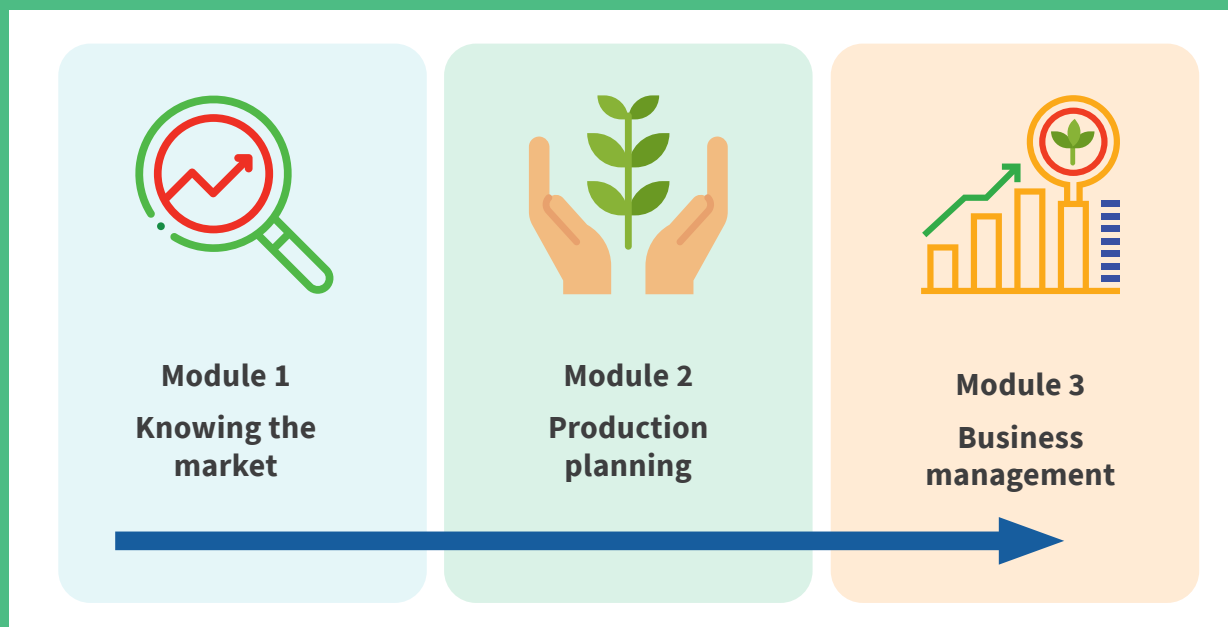
As a result, World Coffee Research (WCR) supported by the initiative for Maximizing Opportunities in Coffee and Cacao in the Americas (MOCCA, by its acronym in Spanish) and in alliance with the Sustainable Economy, Environment and Agribusiness Unit (UEAAS, by its acronym in Spanish) of the Tropical Agronomic Center of Research and Teaching (CATIE, by its acronym in Spanish), has developed this guide for profitable management of coffee seed production and nursery businesses.

This guide is intended to train people involved in these fields to develop their entrepreneurial skills, through three training modules on key topics, categorized into the following main groups:

To guarantee the success of this guide, key actors from five different countries were consulted. This guide must be complemented with efforts within the sector, to reduce the risk of the seed producers and/or nurseries in the medium term and, thereby reducing the risks of the remaining links in the chain, such as coffee producers, processors and roasters.

This guide on profitable management of coffee seed and nursery businesses has the mission of being a useful tool for producers and technicians in the coffee sector. This guide provides instruction on key issues such as: identifying management improvements, marketing, and finance of agribusiness. Each of the guide's modules presents information about agribusiness management, with clearly outlined steps for improvement, accompanied by spreadsheet tools to successfully achieve the objectives set by the entrepreneur.

Please note that this guide includes QR codes that link to complementary resources, as well as the tools developed in the spreadsheets. To use these codes, users must have access to appropriate devices (such as a camera-enabled smartphone) and applications (such as a QR code reader app, which must be downloaded beforehand).



GLOSSARY

Coffee Grower: Coffee Producer.

Productive Capacity: A producer's maximum possible output.

Working Capital: The necessary amount of resources that a company needs to be able to carry out its operations.

Centro Agronómico Tropical de Investigación y Enseñanza (Tropical Agronomic Research and Teaching Center): Regional center dedicated to research and postgraduate teaching in agriculture, management, conservation, and sustainable use of natural resources. (more information can be found at: <https://www.catie.ac.cr/que-es-catie.html>)

Weeding : The elimination of unwanted weeds.

Fixed Costs: Costs that companies must pay regardless of their level of operation (electricity, water, rent, etc.)

Variable Costs: Costs that change as the quantity of the good or service that a business produces changes.

Quantitative Data: Data found in numerical form, for example, statistics or percentages.

Qualitative Data: Data that are generally not measured with a number and that express characteristics, qualities, or attributes.

Demand: Quantity of goods or services that are requested from a certain market.

Depreciation: Loss in the value of an asset during its useful life.

Survey: An instrument that has a series of questions to gather data through the opinion of a specific audience.

Interview: A structured conversation where one participant asks questions, and the other provides answers.

Descriptive Statistics: Statistics that summarize or describe the characteristics of a data set.

Inferential Statistics: A branch of statistics that is responsible for generating conclusions or deductions from a sample of data based on a set of methods and techniques.

Flow Chart = Process Chart: A graphic representation of a sequence of activities or actions for a specific production process.

Liquidity: The difference between income and expenses that a company or project has for a given period.

"Match" Stage Seedling: The stage of a coffee seedling after germination when the stem grows, but the cotyledons are still enclosed in parchment. Called Fósforo (match) in Spanish due to its visual similarity to a common match (see image below).



"Match" Stage Seedling

"Cotyledon" Stage Seedling: The stage where a coffee seedling sprouts its first leaves or cotyledons. Also called "Chapola" or "Butterfly" in Spanish due to its visual similarity to a butterfly emerging (see image below).

Seed Lot = Mother Plant Lot: A plant or plant lot where the "mother plants" are grown to harvest seeds.

Machete = Cutlass: A long knife used to cut weeds or plants.

Maximizing Opportunities in Coffee and Cocoa in the Americas: Initiative funded by the United States Department of Agriculture and implemented by a consortium led by TechnoServe. (information taken from the website <https://mocca.org/es/inicio/>)

Supply: Set of products and services that are in a market available to be consumed at a certain time.

Technical staff: Person who has the knowledge, qualifications, and experience necessary to carry out a specific task in a company or organization.

Operational staff: Collaborators or field laborers who work within production.

Investment Plan: A plan that includes the investments and accompanying costs necessary to carry out a project.

Seedling: A young plant grown from seed. Refers to the stage from germination to transplantation in the field.

Breakeven Point: The minimum volume of sales or units required to avoid profit or loss.

Cost/Benefit Ratio: A financial indicator that measures the relationship between costs and profits in a company or project.

Market Segment: A group of consumers or buyers who have homogeneous or similar characteristics within a market.

Market Analysis: A brief analysis that helps producers gain insight on the behaviors and needs of their target group/buyers.

Internal Rate of Return (IRR): A tool used to evaluate the profitability of an investment within a project, expressed as a percentage.

Net Present Value (NPV): The difference between cash outflows (costs) and cash inflows (sales).

Nursery: A producer of plants.

World Coffee Research: Non-profit organization dedicated to the collaborative research and development of the global coffee industry to grow, protect, and improve the supply of quality coffee while improving the living conditions of the families that produce it. (More information can be found Online at: <https://worldcoffeeresearch.org>).



"Cotyledon" Stage Seedling

MODULE 1

KNOWING THE MARKET



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INTRODUCTION

For any type of business, it is important to know the market that it is serving or the potential market that it is seeking to reach. That is why all companies must conduct a market survey in order to: provide a knowledge base of potential buyers or customers who would be interested in the product or service, to reduce risk, learn about opportunities, and measure business profitability.

Market analysis is essential for the operation of any agribusiness. Through market analysis, agribusinesses can anticipate the needs of their buyers. If an adequate interpretation of the needs of buyers is not carried out, economic and administration risks may emerge. For example, nurseries can suffer profit losses by producing too many seedlings and not being able to sell them all or by producing too few seedlings and losing the trust of their customers.

This module covers a series of steps that are key to developing an effective market analysis, such as: the identification of information sources, the collection of information, the selection of key information and its analyses, the identification of opportunities, and the implementation of good practices.

There are two methods to analyze a market: The first is through a market study, which is an extensive investigation that encompasses the different aspects required to obtain commercial viability in the market, product, or business, where it is going to be developed or where it is being developed.

The second mechanism is a market survey, which is shorter than a market study. A market survey uses small random samples that represent the opinions of buyers or customers. Market surveys help producers obtain strategic information quickly and at low cost, offering general and accurate ideas on the topics of greatest interest to support business decision-making processes.

This module will be complemented with a market survey tool, which is intended to be used as a basis for conducting a market analysis in coffee seed production and nursery businesses.



MODULE SUMMARY

During Module 1: “Knowing the Market”, recommended steps are presented, so that technicians in the coffee sector, coffee seed producers, and coffee seedling producers can carry out an adequate market survey.

As a first step, a series of questions are listed, which aim to define the need for the company to carry out a market analysis. The second phase requires the development of a series of steps that are necessary to plan the market survey. The most relevant aspects of the market survey are defined in this phase, from the identification of the problem to the analysis of the information, and subsequent generation of results and conclusions.

Once the market survey is concluded, the conclusions from the market analysis are analyzed in the third step in order to identify the opportunities that seed producers and nurseries can use to their advantage.

Finally, the fourth step presents a series of good practices in "knowing the market," as well as a risk analysis to complement to the market survey. This process will help ensure the success of the analysis.

OBJECTIVES OF "KNOWING THE MARKET" MODULE

GENERAL OBJECTIVE

Introduce technicians, seed producers and coffee nurseries to the methods and tools necessary for the development of a market survey, as a starting point for decision making.

SPECIFIC OBJECTIVES

- 🔧 Present the steps for the development of a market survey.
- 🔧 Develop tools to facilitate the learning process.
- 🔧 Suggest methods, thoughts, or observations on the different topics that are developed in the preparation of a market survey.



STEP 1

KEY QUESTIONS BEFORE BEGINNING

Carrying out a market survey provides a broad overview to companies and organizations, where **opportunities are identified** and **the risks** of entering a new market, or improving their position in it, **are minimized**. For any business to be successful, it is important to have knowledge of the market in which it is located. This process helps businesses understand their potential customers and suppliers, as well as assisting with adaptability of a product to meet the demand.

On average, businesses that lack clear insight into their market are less likely to succeed. Therefore, it is critical for business to conduct proper market research.

WHY CONDUCT A MARKET SURVEY?

Before conducting a market survey, the user needs to identify a key component called: **the market objective**. Through this objective, the reason or motive for which the market survey is carried out is established. In most cases, the objective is **to analyze the existing supply and demand** for a specific product or service in order to identify opportunities, which would improve market share.

There may also be other objectives, such as: knowing the competition, analyzing the chances of success of a new product, or entering a new market, etc. Whatever the motivation, it must be **clearly defined from the start**.

WHO SHOULD DO A MARKET SURVEY?

Market surveys are generally prepared by **entities, institutions or companies** that seek to channel information for decision-making. Generally, in each country, there are different government institutions, associations and chambers of commerce that oversee specific sectors (as in the case of the coffee sector), which apply this type of tools in order to find **solutions and to improve the participation** of different producers. Sometimes, these entities publish their results. There are also private companies, technicians and consultants that support the various sectors in the preparation and compiling of this information.

However, if this information is not documented and available to the public, businesses must be able to generate it on their own, using a structure and method that allows to do it in a simplified, appropriate, and timely manner.

WHEN TO CONDUCT A MARKET SURVEY?

There is no specific time to carry out a market survey, but rather multiple factors that lead companies and organizations to implement these studies. Generally, a market survey is conducted when:

1. A business plans to launch a new product.
2. A business wants to obtain information about the current market in which the product is located.
3. A business aims to access other market niches.
4. A business seeks to adapt to changes and new market conditions.

How do you create a market objective?

Market objectives have actionable targets designed to provide not just overall direction, but clear and specific actions. All market objectives must be:

1. **Clear:** Objectives must be specific to avoid confusion in the results.
2. **Measurable:** Objectives must have a clear data point to evaluate success.
3. **Achievable:** Objectives must be attainable in a given period of time.

Example: “Define the number of plants that are sold in one planting season for the Jinotega region”

STEP 2.

MARKET SURVEY PROCEDURE

HOW TO CREATE A MARKET SURVEY?

A market survey is a **useful tool** to collect strategic information to strengthen decision-making processes. However, many businesses can find the process unclear. The following figure shows the most common steps when planning a market survey:

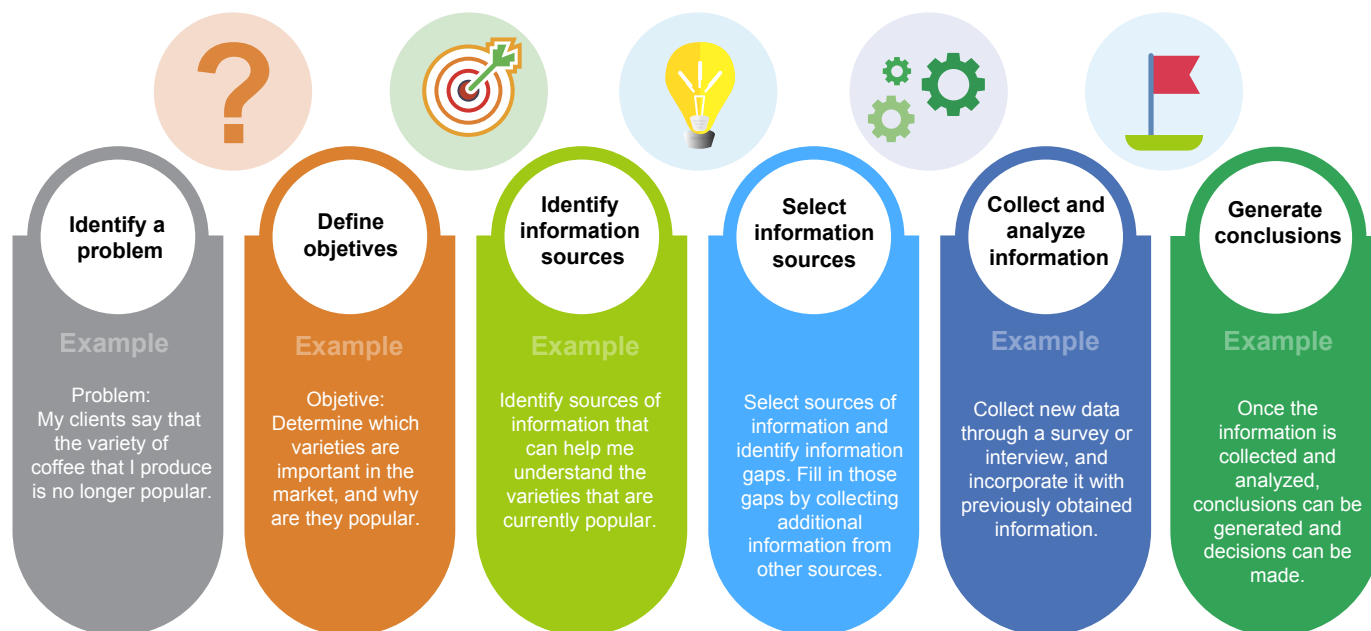


Figure 1. Example steps to plan a market survey

MARKET SURVEY PROCEDURE – DETAILED

Each of the steps exemplified in Figure 1 are detailed below as the basis for the planning and development of a market survey. It should be noted that, although technical support (👨🔧) will always be recommended to carry out the survey, there are steps that seed producers and coffee nursery producers can execute on their own, which are shown with the icon (👩🌾).



1. UNDERSTANDING THE ROOT CAUSES OF THE PROBLEM *

This step refers to identifying the area in which there is a need for more key information. In this step, it is necessary to analyze topics such as: existing competitors, target markets, functionality of the product being marketed, etc.

Examples of commonly identified problems:

- 👩🌾 I have more product than I can sell.
- 👩🌾 I don't know what prices to set for my products.
- 👩🌾 Buyers aren't interested in my products.



2. DEFINE THE OBJECTIVE (S)*

Examples of commonly identified objectives:

- 🔧 Learn about the needs of the market so that my business can adapt accordingly.
- 🔧 Learn about my competition, their prices, and other factors that may allow me to gain an advantage in the market.

When an objective is established, the market survey's goal can be easily defined.



3. IDENTIFY THE REQUIRED INFORMATION AND THE SOURCES NEEDED TO OBTAIN IT *

To start the investigative process, it is necessary to identify the information required to achieve the set goal.

Examples of information that might be required:

- 🔧 What are current the prices in the local market and/or the national market?
- 🔧 What is the local market's volume?
- 🔧 Who is my competition and what is their competitive advantage? Ex: Coffee varieties, marketing, etc.

Where do I find this information?

First, it is necessary to define the type of information you need to collect. If the information is **general** about the product (i.e. price trends and national/global markets), this information is can be found in **secondary information** sources. This means that the information is not obtained directly from a person, but from studies previously carried out by someone else. The most common secondary information sources are bibliographic references, such as databases, books, magazine articles, newspapers, studies, etc. which can be found in-print and Online (see table 1 and table 2, page 17 and 18).

In the specific case of seed production and coffee nurseries, **secondary information** can be collected through materials prepared by government institutions,

producer associations, service agencies, non-governmental organizations (NGOs), projects, consultancies, among others. If the information is not available at first glance, it is possible to contact a technician in the country that is involved in the coffee sector, to see if they have carried out any previous research that contains useful information for the prospective study.

On the other hand, if the objective is to collect **more specific and updated** information about a particular market, its actors, prices, volumes sold, bottlenecks, etc. the best resource, in most cases, will be **primary information**. In this case, various tools can be used. For example, interviews or surveys can be taken of the target market, national and international intermediaries, and coffee producers in order to gain any relevant information to the market objective. **Focus groups and expert opinions** can also be used to obtain opinions about the sector, while **field observations** can help analyze the competition.

Below, is a summary of the most common types of data sources used for collecting relevant information to be analyzed in the market survey.

Easy actions that coffee seed producers and nurseries can take to obtain additional information about their target markets:

1. Visit other producers in the area to learn about the competition, their customers, and other potential opportunities.
2. Take quick 15 question (maximum) surveys.
3. Utilize the “undercover customer trick” to determine a competitor's the prices, quality, and technology.
4. Review competitors' Online presence including advertisements, websites, social media, etc.

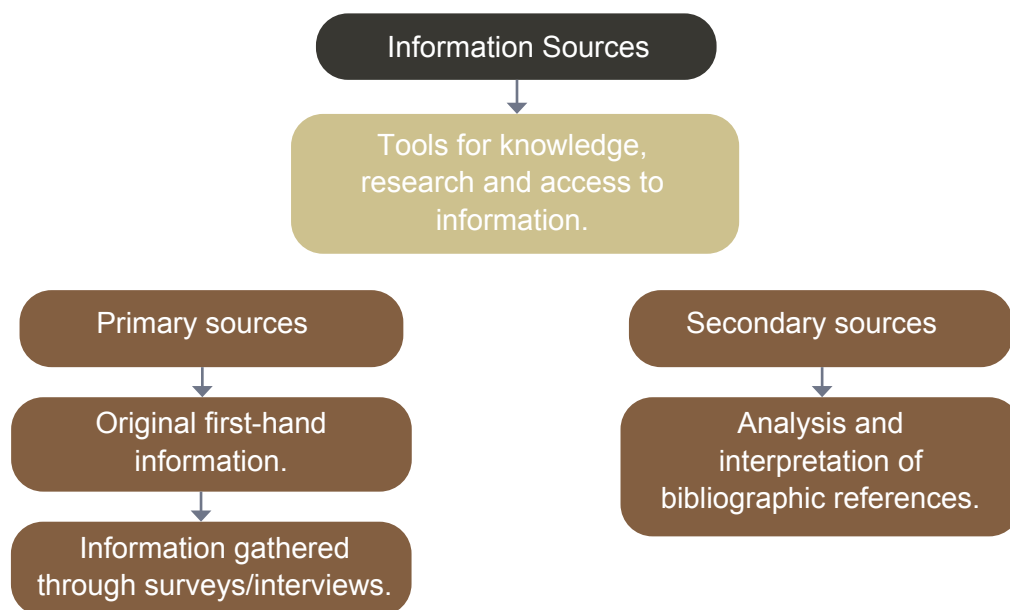


Figure 2. Summary of the most common types of information sources to conduct a market survey.

It is important to emphasize that information sources are not mutually exclusive, that is, depending on the type of product and the amount of information available on it, multiple sources of information can be used. In this way, one type of information will be able to fill the gaps left by the other one, and vice versa.



Recommendation

Creating a map of 'main actors' can be a useful tool to determine the key actors who will provide the information. A key actor is someone who, positively or negatively, influences the process or situation. To learn how to create a key actors map, you can visit the following link, or scan the following QR code:

<https://zigla.la/blog/el-mapeo-de-actores-como-herramienta-visual-para-el-diagnostico-de-un-programa/#::~:~:text=El%20Mapeo%20de%20Actores%20es,los%20resultados%20de%20una%20intervenci%C3%B3n.>



4. SELECT KEY INFORMATION*

Not all information has the same weight or value for a market research. At this stage, it is important to select **the information that is most relevant and reliable**, obtained from both primary and secondary sources for the market survey. The purpose of this is to highlight the information that enriches the investigation and discard the information that does not contribute.

How do I determine which information is important?

Always keep the **objectives or goals** defined for the market survey in mind when selecting key information.

How do I select information from secondary sources?

Similarly, for the selection of key information from secondary sources, it is necessary to **review** the bibliographic references and the **date of their publication**, since experts recommend only using sources published within the past 10 years. However, given that, in the coffee sector, market conditions are variable and depend on external variations such as market prices, exchange rates, etc., it is recommended to review and select information published within the past three to five years. Below, there is a summary of the most relevant aspects to consider when selecting information from secondary sources, which will be analyzed in the market survey.

- 1 Ensure that the selected information contributes to the survey objective.
- 2 Date of publication of bibliographic references within 3 to 5 years.
- 3 Identify the information that contributes and enriches the market analysis, to avoid excess information.
- 4 Accessibility and reliability of information. For example, secondary information that comes from an institution, research center or university can be considered more reliable than information that comes from websites or blogs, where the information shown is of doubtful origin.

Figure 3. Relevant aspects that must be considered when selecting secondary information.

How do I select information from primary sources?

For the selection of key information that comes from primary sources, it is necessary that the **tools** that are going to be applied to the different key actors (which are identified through the elaboration of the map of actors) contain questions that are consistent with the objective that is pursued and, thus, generate an analysis that will be beneficial. All of which is analyzed in step 5 of collecting primary information.



Download [here](#) the Excel tool or scan the following QR code to: Define the objective, identify the required information and the sources that will be used to obtain it, and select the key information (see Annex 2).

This information can be found on sheet “2. Ident and info selection” from the Excel tool.



5. COLLECTION OF PRIMARY INFORMATION

How to correctly collect the information?



In most cases, good market research requires **exploratory research**, since the data from secondary sources does not always provide all the specifics that a business may need. There are different ways to collect information, in some

cases, recognized databases are used to assess data and make decisions. However, the coffee sector has not been as fully-analyzed (regarding seed and seedling production) as other agricultural sectors; therefore, it is recommended to collect information through primary sources.

What are the most common tools?

1. Interviews

Interviews are instruments used to interact between two or more people, where one person is in charge of formulating and asking questions related to the topic being investigated, while the interviewee provides the information requested verbally.

There are two types of interviews:

- 🔗 **Un-structured interview** The person who is in charge of asking the questions does not use a specific guide, they simply address the interviewee on the topic of interest, trying not to deviate from the topic.

- 🔧 **Semi-structured interview:** The person interviewing follows certain guidelines with specific questions, which cover the objectives to be reached. Ideally, the interview should be conducted in a natural and fluid manner.

To conduct an interview successfully:

- 🔧 Create an instrument that meets the needs of the research.
- 🔧 Conduct research prior on the topic to be interviewed.
- 🔧 Review the interview and understand the structure.
- 🔧 Be confident and create empathy with the interviewee

2. Surveys

Surveys are instruments that are used to capture **quantitative information**, based on a representative sample of the individuals to be studied. For example, a subject group could be a group of specialty coffee producers, who could be clients of the nursery or seed lot. In this case, the difference between an interview and a survey lies in the form of collection and the type of questions that are asked. Generally, in surveys there usually are closed questions (yes/no) for users to choose the one that best describes their perception. For example, when you ask: “Do you have documents on the traceability of the seed you use?” While interviews are characterized by having open questions, where the interviewee can offer his/her opinion on the subject. For example: “What strengths and/or opportunities do you have when producing coffee seedlings?”

Surveys can be carried out **physically**, i.e., the information is collected in a manner (paper) to later be tabulated; or **digitally**, for which existing platforms are used (see Annex 1), where the interviewer sends a digital link that redirects respondents to the respective survey. Currently, data collectors prefer to use digital platforms, since they tabulate the data automatically, and also generate graphs and tables. Unlike physical surveys, where the interviewer must perform these tasks manually. In addition, digital platforms save costs and reduce the ecological footprint by minimizing the use of paper

To take advantage of the use of surveys, it is recommended:

- 🔧 Create an instrument that meets the needs of the research.
- 🔧 If possible, considering time and money, conduct a pilot survey to measure the shortcomings of the instrument.
- 🔧 If it is a physical survey, you must review and understand the proposed structure.
- 🔧 Apply the survey to the selected sample.
- 🔧 Know if the person surveyed has time to apply the instrument.
- 🔧 Show a positive attitude and generate empathy.

3. Field observation

Field observation is a primary information gathering tool used to assess the product being sold and the existing competition. By observing situations that happen around it, it is possible to assess **how** the product is being sold and **which** are the particular characteristics that it has.

For a field observation, it is recommended:

- 🔧 Bring a notebook or notebook to record all relevant observations and data.
- 🔧 If it is in the legal and regulatory provisions, document through photos and videos.

In this case, when conducting a market survey, the field observation tool may not have any relevance for the data collection. However, it is mentioned as an alternative instrument in cases where it applies. A clear example for this technique is when a product is placed in a specific supermarket, there, it is possible to assess how much consumers buy of a certain product. Applied to coffee nurseries, the example may be when a nurseryman decides to rate the product that his competition has by visiting another producer. During this visit, you can observe the status of your competitor's plants, their varieties, the type of container, the infrastructure they have, as well as any certifications or seals that differentiate their product.

What role do questionnaires play in the application of interviews and surveys?

As mentioned above, for both the application of surveys and interviews, it is necessary to prepare a questionnaire and analyze the main points from where information will be obtained.

For this, there are different criteria that must be met before starting the application of any of these instruments:

There are four key questions that must be asked when the goal is to design a structured questionnaire, without errors:

- 🔑 How much time will respondents have to answer the questionnaire?
- 🔑 How much time will the researcher have to edit, present, apply, code, process and analyze the questionnaire?
- 🔑 How willing are respondents to share information?
- 🔑 How much will the questionnaire cost to implement?

4. Focus groups:

Focus groups are a primary information gathering tool used to **collect opinions** from buyers or clients (**qualitative data**). A group of approximately five people are brought together and asked a series of questions about the product that is being sold. They are then asked to share their opinions. This process aims to improve existing products or introduce a product into new markets.

Focus Group Best Practices:

- 🔑 Prepare questions for a semi-structured interview
- 🔑 Conduct the focus group in a safe space.
- 🔑 Ensure that the individuals in the group have different academic backgrounds, but are part of the same sector.
- 🔑 Include up to 10 individuals.
- 🔑 Designate an individual to lead, ask questions, and respond to the participants.



6. ANALYZE THE COLLECTED INFORMATION.



Conducting an analysis of information is critical in order to know the market, since it provides the basis for decision making. To increase efficiency the information should be organized and categorized. Additionally, the collected data must be interpreted and given meaning, according to the objectives and goals set.

Which tools allow you to analyze information?

The selection of various forms or tools to analyze information will depend on the type of data. This depends on the type of questions that have been posed in the previous stages. One popular tool is **basic descriptive statistics**, where, through calculations of the mean, mode, and standard deviation, analysts can determine various patterns in the data. However, this approach requires quantitative data. For example, data can be collected in a simple "Yes" or "No" format.



Download [here](#) the Excel tool, or scan the following QR code for point 5 "Collection of primary information" (see annex 3).

This information can be found on sheet "3. Information gathering" from the Excel tool.



Average or mean: A statistical measure that indicates the central tendency of the data. It is used to calculate a representative value within all the values that are being averaged. The calculation of the average is quite simple: Add all the data and divide by the total amount of data, as shown in the following formula:

$$\bar{x} = \frac{\sum x}{n}$$

Where: x = Average $\sum x$ = Sum of data n = amount of data

For example: If you have three producers of coffee seedlings from the Lempira variety, where the first produces 50,000 plants, the second 100,000 plants and the third 150,000 plants; one can determine that these producers, on average, produce 100,000 plants each, per year.

$$\bar{x} = \frac{50.000 + 100.000 + 150.000}{3} = 100.000$$

Mode: A statistical measure that indicates the value that has the highest occurrence (that is repeated the most) in a data set.

For example: If we have the data of five producers of coffee seeds which produce: 5 kg, 10 kg, 20 kg, 15 kg and 10 kg of seed per year; the data that is repeated most frequently is that of 10 kg, so this would be the mode within this data set. This is important, because the average does not indicate frequency of a certain value, while the mode does.

Standard Deviation: A statistic that measures the dispersion of a dataset relative to its mean, or average. The following formulas are used for its calculation:

$$DE_{Poblacional} = \sqrt{\frac{\sum |x - \mu|^2}{N}}$$

$$DE_{Muestral} = \sqrt{\frac{\sum |x - \mu|^2}{n - 1}}$$

Where: μ =average x = value in a data set N/n = the number of observations

Continuing with the example that was used to show the average, the standard deviation of this sample of coffee nurseries is 50,000 plants. This means that although the average production is 100,000, the producers in the sector produce between 50,000 and 150,000 plants.

$$DE_{Muestral} = \sqrt{\frac{|50.000 - 100.000|^2 + |100.000 - 100.000|^2 + |150.000 - 100.000|^2}{3 - 1}}$$

$$DE_{Muestral} = 50.000$$

Below is a series of guidelines for analyzing gathered information:

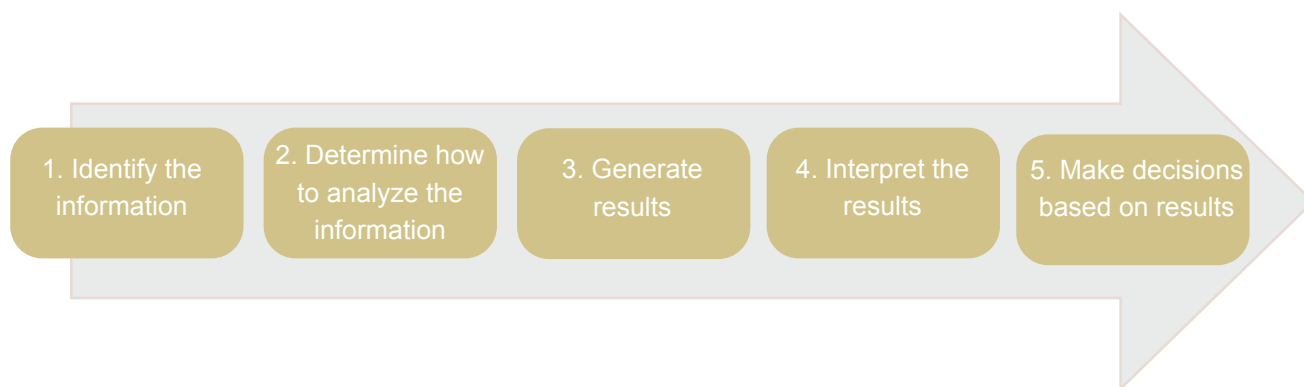


Figure 4. Guidelines for analyzing available information.

GUIDELINES:

1. Identify the information

To identify the information, it is necessary to know the **type of data** that was collected and that is going to be analyzed. These data types can be qualitative or quantitative.

Quantitative data refers to all data that can be quantified. Ex: The data can be expressed in numbers.

These are derived from questions that encourage people to provide specific data points in numbers. For example, in a survey of coffee nursery producers, questions can be asked to find out quantities and prices. The example below details a **quantitative variable**.



Scenario 1. Quantitative data

Imagine that a producer owns several lots with mother plants for the production of coffee seeds, and wants to know what the demand for seed will be for the next season. As a result of this situation, they decide to include the following question in their market survey tool, which is asked to a prospective nursery buyer:

How many seeds do you buy, per season, for the production of coffee seedlings?

In this case, the nursery producer says that they need 10 kilograms of Caturra variety seeds for the next season.

This answer is presented as a number which classifies it as quantitative data.

On the other hand, **qualitative data** provide characteristics or attributes that cannot be measured with a number. There are several types of qualitative questions. For example: The interviewer asks the interviewee a question about their opinion on a subject,

this answer is classified as qualitative data. However, there are other types of qualitative questions such as **nominal and ordinal** questions, which are exemplified in a specific situation below.

Scenario 2. Ordinal Qualitative Data

Imagine that a coffee nursery producer wants to know how satisfied their clients are with the quality of the nursery's seedling transportation service. Therefore, they ask the following question in an interview with a coffee farmer.

How do you rate the transportation service provided by the company to move the coffee seedlings?

- a) Excellent () b) Good () c) Fair ()
d) Bad () e) Terrible ()

The previous question is classified as an ordinal qualitative variable, because it expresses the degree of satisfaction regarding the quality of transportation service that is provided to coffee growers, with an order of satisfaction provided in the answers.



Scenario 3. Nominal qualitative data

Imagine that a nursery producer wants to know how the market will behave next year and which varieties they need to produce. In recent years, this nursery producer has had a greater demand for five varieties of coffee seedlings. However, the demand varies from year to year. Therefore, the nursery producer wants to determine the market requirements for the next year. They ask coffee growers the following question:

Which of the following varieties do you require for the following year?

- a) Anacafe 14 () b) Costa Rica 95 () c) Caturra ()
d) Marsellesa () e) Geisha () f) Another variety:

Unlike Scenario 2, there isn't a specific order or ranking to the answers. Instead, the respondents are asked to provide specific responses in no particular order. Therefore, this example would represent a nominal qualitative variable.

Having learned about the different forms of data, the next step is information analysis.

2. How to analyze the information?

The following steps provide details on how to properly analyze the gathered information:

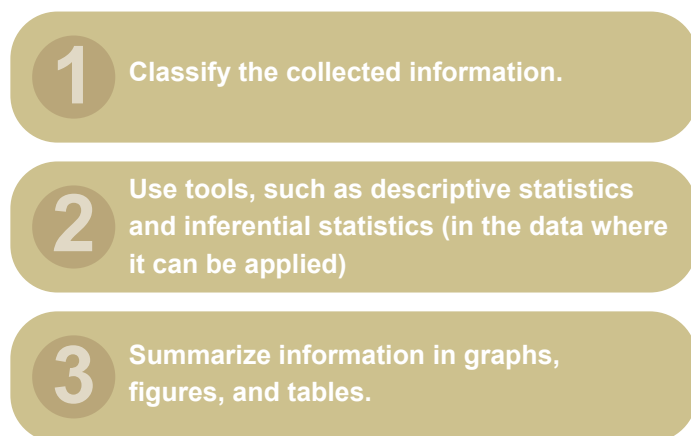


Figure 5. Information analysis steps using primary and secondary sources.

As we see in the figure above, it is necessary to classify and categorize the collected information according to the set objectives. **There are different ways to analyze and interpret information.** Therefore, different tools (like descriptive and inferential statistics) are used to summarize the information. Graphs, figures, and tables can be used to visualize the information as well.

Applying tools, such as **descriptive statistics**, organizes the information in a simple way for the user to review the data. It is necessary to collect and classify information in order to present it clearly through graphs, tables, and diagrams. For this reason, there are different indicators to measure the results: the average, the mean and dispersion measures, such as the standard deviation mentioned before.

Inferential statistics use a sample of individuals or results to generate a conclusion about the general population. In other words, through inferential statistics the researcher can make models to analyze data patterns and make deductions from the information. Inferential statistics is often used for modeling, analysis of variance, time series or data mining. This type of analysis

is more common in scientific research.

Lastly, **figures and tables** generate a visual and organized summary of the information collected, and the graphs reveal information behavior patterns. These tools can help visualize a certain behavior over the years and certain product trends.

3. Generating results: tables, figures, or graphs

Different tools can be used to generate **tables, graphs or figures** automatically when the user enters the collected data. Bar or pie charts are recommended for graphing qualitative data, while dot charts and line charts are advised for quantitative data.

There are many **digital platforms** that facilitate the automatic generation of graphs and tables (see annex 1). Software packages, such as Microsoft Office, have built-in tools for generating graphs and tables. To learn more, visit the following links or scan the QR codes:

<https://support.microsoft.com/en-us/office/add-a-chart-to-your-document-in-word-ff48e3eb-5e04-4368-a39e-20df7c798932>



<https://support.microsoft.com/en-us/office/create-a-chart-from-start-to-finish-0baf399e-dd61-4e18-8a73-b3fd5d5680c2>



4. Interpreting Results

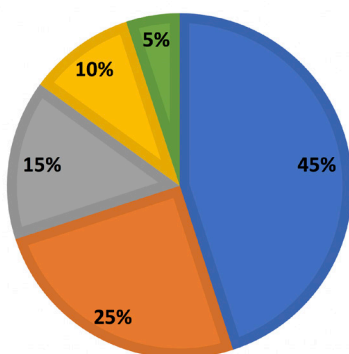
After generating results, an **informational review** from different sources (primary and secondary) is made, to know if there is a relationship between what is being investigated and what other authors have investigated previously. To interpret the results obtained from primary or secondary information sources, it is necessary to carry out a visual demonstration through graphs and tables.

Once the interpretation of the results has been completed, it is necessary to check if the objectives set have been met. As mentioned before, tables, figures and graphs allow information to be presented visually, which can help the entrepreneur reach conclusions. To exemplify the topic of interpretation, the example below is provided:

Scenario 4. In Scenario 2, on p. 12, a nursery producer wants to know their customers' opinions on the quality of the transport service that coffee growers receive for the transfer of seedlings. The following graph shows the results obtained by that nursery owner. Most of the producers rate the service as “good”, although there are still several clients who rate it as “fair” or “bad.” This provides visual data for the nursery owner to analyze how best to improve the service and get less negative feedback in the future.

Degree of satisfaction of coffee growers, regarding the quality of the service of transportation

■ Good ■ Fair ■ Bad
■ Excellent ■ Very bad



5. Decision-Making

Decision-making is **based on the conclusions** generated from the interpretation of the results. This step helps guide the company in the correct direction (according to changes in the market), seek better solutions aligned with the objectives of the organization, and identify all possible alternatives.

Advice: Conclusions are not simply a summary of all the research. The decision-making process requires one to choose the most relevant data and combine them in order to make a conclusion.



Download [here](#) the Excel tool or scan the following QR code for point 6: “Analyze the collected information” (see annex 4).

This information can be found on sheet “5. Information Analysis” of the Excel tool.



STEP 3.

IDENTIFY OPPORTUNITIES

To identify opportunities in the market for coffee seed production and nurseries, one must reflect on the current **strengths** of the company and then analyze and compare them with market **opportunities**. It is important to carry out this self-diagnosis in order to improve the company and better cover the market.

HOW TO IDENTIFY OPPORTUNITIES?

In the **strategic planning** phase, the current state of the market is identified and analyzed according to the opportunities provided by the market and the direction of the company. To do this, the nursery owner must answer basic questions such as: Where are we located? What opportunities does the market give us? Can I take advantage of these opportunities? How can I take advantage of these opportunities? Below is a figure that emphasizes this process:

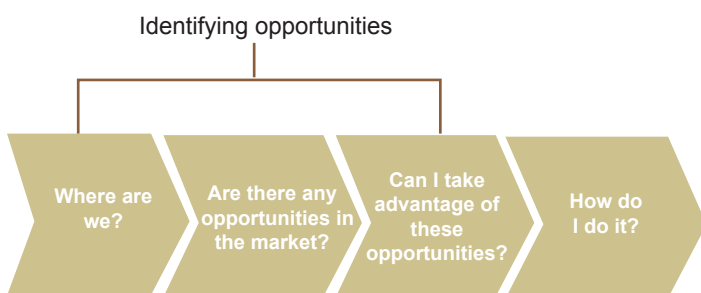


Figure 6. Questions that must be asked, as part of strategic planning, to identify opportunities.

In the first question (Where are we?), the current state of the company and its strengths are analyzed. These strengths are all the **aspects that make the company stand out** and what makes it comparatively superior to its competition (i.e. the attributes that make the product or service offered different). The analysis and definition of strengths is done internally (i.e. it is generated within the company).

To identify strengths in seed production and coffee nurseries, the following aspects must be considered: production capacity, technology used, skilled labor, product differentiation, access to markets, resources (land, working capital), etc.

Strengths are only significant when they directly serve a customer's need. When this is the case, that strength becomes a capability. The manager or entrepreneur can then develop marketing strategies to boost those capabilities in the form of strategic competitive advantages. (Ferrel & Hartline, 2012, p. 129).

Subsequently, the nursery manager can **capitalize on these opportunities** through favorable situations in the market. These opportunities arise naturally and are influenced by the behavior of the buyer. It is important to emphasize that not all the opportunities in the market can be advantageous. This means that some of these opportunities are not profitable for the company. Therefore, after identifying the opportunities, the following question must be answered: Can I take advantage of these opportunities to benefit from the situation and grow the company?

Example: There is a market opportunity for the commercialization of hybrid varieties in the coffee sector. However, the initial investment to build the laboratory for the reproduction and farming of these varieties is very high. If the entrepreneur does not have the capital to build it, this opportunity cannot be exploited.

When strengths become capabilities and they are combined with opportunities, the company manages to satisfy the needs of the client (in this case, those of coffee growers and intermediaries) in an efficient way, thus generating a **competitive advantage**.



Download the Excel tool here or scan the following QR code for step 3: "Identifying opportunities" (see annex 5)

This information can be found on sheet "6. Identif. opportunities" from the Excel tool.



STEP 4.

ANALYSIS OF BEST PRACTICES AND RISKS IN THE MARKET

1. RECOMMENDED BEST PRACTICES TO UNDERSTAND THE MARKET

The main purpose of the market survey is to gain insight into **the evolution and the variations** in the behavior of buyers and competitors, so that the company can adapt and make better decisions.

Why is it important to understand the market?

When conducting a market survey, different techniques are used to obtain information about buyers: the **target market segment** and the **competition**. Market research defines the buyer profile for each product. It anticipates the reaction that this may have on the product or service being offered, and it defines the current or future market size. In addition, when conducting a market survey, it is possible to identify the elements that can transform the market or the product (ex: new legislation or technologies).

To carry out a successful market survey with enriching information, it is recommended to follow these steps on

Good Market Survey Practices:

1. Define a research goal or objective.

This leads the investigation. It indicates what will be investigated and what the data will be used for.

2. Define your research methodology.

Determine which research methodology is best to apply.

3. Research and analyze the competition.

This helps identify business opportunities, innovate, and offer products and services in a better way. This also helps to recognize trends in the market.

4. Use digital tools.

Information technologies can facilitate and simplify tasks. They can also help to reduce costs.

5. Define the target customer.

It is important to categorize the market according to its characteristics and behaviors in order to satisfy the needs of each customer.

6. Perform a SWOT analysis (example on page 17).

This is an internal and external self-examination in which the strengths, opportunities, and weaknesses of the company are defined. Companies use it to determine their business strategy.

7. Learn or review statistical data.

This applies to data collection and it is important because instruments such as surveys help to provide relevant information that can be tabulated and interpreted in the results.

8. Choose the tools that are appropriate for the investigation.

There are different methods to collect and analyze information when conducting a market research survey. Therefore, there is a need to be cautious with the type of instruments and tools employed.

9. Extend surveys and interviews geographically.

Surveys and interviews must pay attention to geographic distribution, so that they are not only located in a specific geographic regions. This wider geographic distribution helps obtain different perspectives and variation according to the research topic.

10. Share information with interviewees.

Frequently, the interviewees are people specialized in certain sectors and the results of the survey may be relevant to them. You must be discreet with the type of information that is shared.

11. If it is within budget, incentivize respondents.

If the survey is very long, it can be incentivized with money or royalties for the respondents. If the survey is done internally, it can be incentivized with drinks or snacks. This is done as a "thank you" for the time spent and the information provided.

Example of a SWOT analysis

As mentioned previously, a SWOT analysis can be carried out in order to better understand the market. An example is shown on the next page:

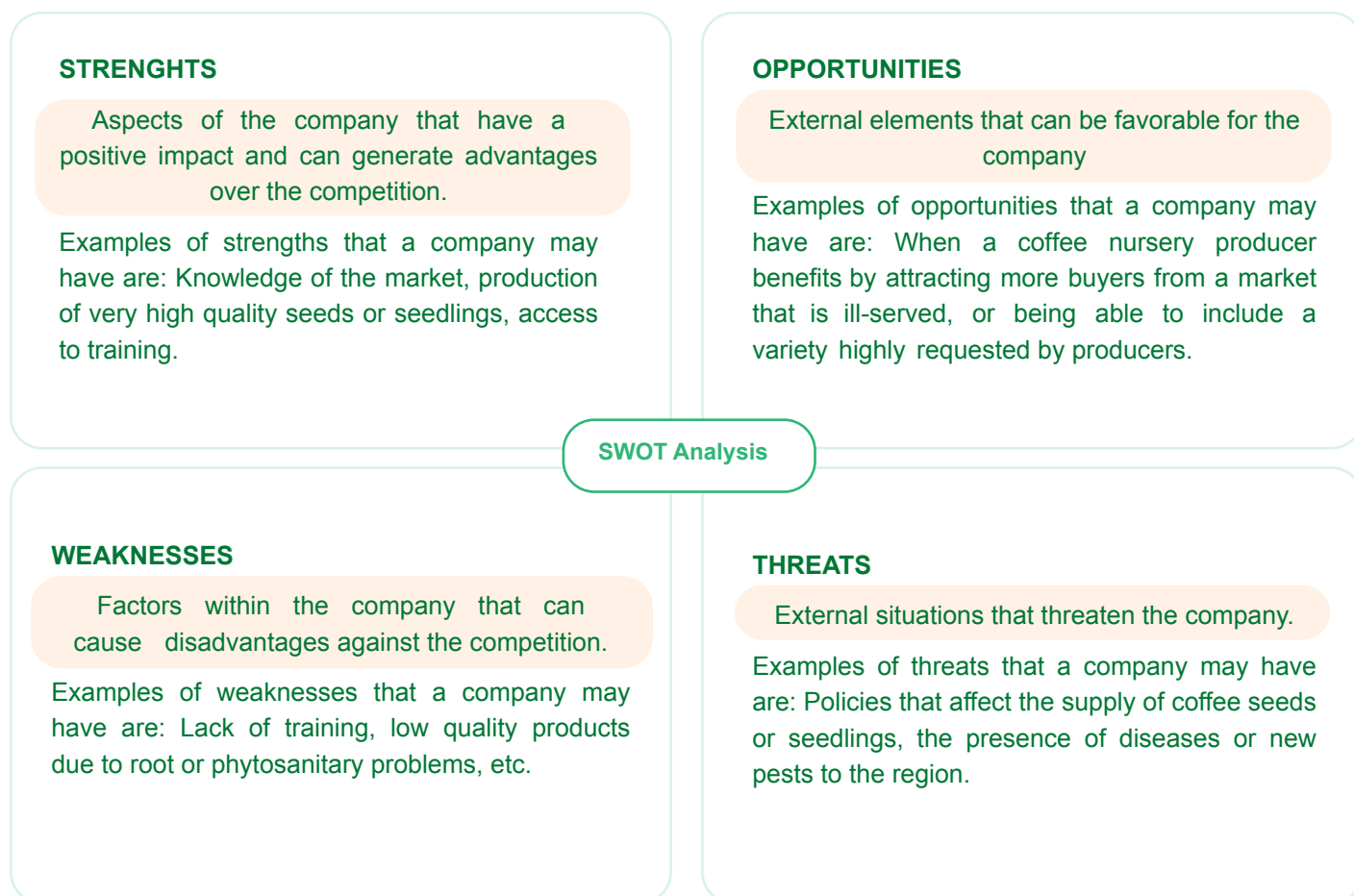


Figure 7. Characterization of the main components that make up a SWOT analysis, with their respective examples.

What role do digital platforms serve when carrying out a market survey?

Digital platforms are mechanisms that allow users to **obtain information and data** on a specific topic, which enriches any investigation. Within the agricultural sector, there are various platforms created by different institutions to obtain **free and up-to-date data**, some of the most common are:

Table 1. Main statistical databases from which information can be obtained.

Platform	Organization	Description	URL
FAOSTAT	Food and Agriculture Organization of the United Nations (FAO).	World data on food, agriculture, fishing, forestry, among others.	http://www.fao.org/faostat/en/#data
TRADEMAP	International Trade Center (ITC).	Global trade data.	https://www.trademap.org/Index.aspx
CEPALSTAT	Economic Commission for Latin America and the Caribbean(CEPAL).	Statistics on agriculture, rural development, among others.	https://estadisticas.cepal.org/cepalstat/web_cepalstat/estadisticasindicadores.asp
ICO	International Coffee Organization	Specific trade statistics for coffee cultivation.	http://www.ico.org/trade_statistics.asp

These platforms provide information about coffee production in different countries of the world and how the market behaves. However, it is not always easy to obtain information about the production of seeds and coffee seedlings because there is little data available to the public. Nonetheless, each country has different institutions dedicated to the coffee sector, which have published various resources related to the nursery or seed sector,

mainly regarding the management of nurseries and seed production. Technicians at these institutions can also provide additional information. Many international organizations work in this field as well. Some of these institutions are:

Table 2. Main organizations linked to the coffee sector in Latin American countries.

Institution	Country	Website
ICAPE	Costa Rica	http://www.icafe.cr/
IHCAFE	Honduras	https://www.ihcafe.hn/
ANACAFE	Guatemala	https://www.anacafe.org/
Salvadoran Coffee Council	El Salvador	http://www.csc.gob.sv/
INIA	Peru	https://www.inia.gob.pe/
CENICAFE	Colombia	https://www.cenicafe.org
World Coffee Research	International	https://worldcoffeeresearch.org/
TechnoServe	International	https://www.technoserve.org/
Maximizing Opportunities in Coffee and Cacao (MOCCA)	International	https://mocca.org/es/inicio/

2. RISKS OF NOT KNOWING THE MARKET

When venturing into any business, it is important to have an overview of **how the market is behaving** since this helps reduce risks and provides a greater probability of success.

The coffee sector is characterized by a dependence on international markets, in terms of prices and demand, since the majority of production is exported abroad. In recent years, the volatility of the international coffee market has been reflected in large variations on the Stock Exchange. In turn, this generates large variations in the prices offered to the producer and in the generation of foreign currency.

The production of coffee seeds primarily depends on coffee growers purchasing coffee seedlings for the renewal or expansion of their farms. The ability for growers to replant or expand their farms **depends** on the income that producers obtain in a given year. Therefore, it is important for seed and seedling producers to know the coffee market and the reality of their customers. This helps to reduce the risks associated with the coffee sector's reliance on the international market.

What negative implications arise from not understanding the market?

When seed and/or seedling producers do not understand the coffee market, endless **adverse factors** can arise. For this reason, companies need to know the direct and indirect factors that may affect them, such as: competition, the country's overall economy, access to financing, new technologies, current trends, etc.

There are also **market risks** that companies can anticipate and calculate. For example: if the price of coffee on the New York Stock Exchange is trending downward, coffee growers will have a lower income and, consequently, may not acquire seedlings to sow that year (or will do so in a smaller amount). The seedling producer must then adjust their production to that reality.

Likewise, there are market risks that are more complex and cannot be quantified. Some of these risks are:

- The **legal risk** - Influenced by the agreements reached between the company and the client, as well as the legislation of each country that may change.
- The **operational risk** - Derived from errors in the production process, such as failures due to

mismanagement or faulty equipment/machinery that can cause the loss of product and, with it, the amount agreed for delivery. **Reputational risks** occur when a bad image of the company is generated due to a particular situation. **Strategic risks** are based on positioning issues and demand analyses errors when entering a new market. These risks typically occur when companies don't carry out a market survey prior to entering the market.

Situational Examples

Here are some common situations that can create risks for companies involved in the production of seeds and coffee seedlings. These examples were collected through interviews with producers.

Situation 1. A coffee seedling producer plans their production without knowing the current market conditions. Based on what they have observed, the market appears to have growth potential, and for this reason, they decide to double their production from 100,000 to 200,000 plants. However, within this growth scenario, they did not consider that coffee growers had already negotiated coffee plant purchases with other nurseries. Therefore, for this year, the production company will have an excess supply for a market that is already saturated. This is classified as a market risk since the producer did not determine or evaluate the behavior of buyers and competitors before increasing their production, which led to significant losses.

Faced with this situation, a possible preventive measure is to seek new clients and, if possible, sign a contract with them requesting an advance of the money as a prerequisite before starting the production of plants.

Situation 2. Imagine that a coffee nursery is producing seedlings of the Icatu variety. One farmer (who knows the market very well) takes advantage of the coffee nursery and manages to obtain a favorable price. The nursery receives sells each seedling for \$0.10. However, when calculating costs, the nursery realizes that the price at which they sold the seeds was below the financial break-even point. After conducting a financial analysis, they realize that the minimum price at which each seedling could sell was \$0.15 (in order to cover its costs and generate a profit).

The situation above demonstrates a market risk through a deficiency at the internal level and lack of knowledge since the producer sold the seedlings below the market price and the company's break-even point.

In this situation, a possible preventative measure would be to perform a cost structure analysis in order to know the break-even price. This helps assess the final price for the client, in order to obtain the profit margin that the company wants (which is explained in module 3).

Situation 3 In some countries, the government purchases plants from coffee nurseries for national projects (in order to promote coffee farming). On many occasions, small-scale nurseries do not have control of the market. When coffee prices fall and coffee growers do not invest in renewing their coffee fields, the smaller nurseries are affected, while the larger producers are not.

In these cases, it is difficult to take any action to prevent market risk, since it comes from an external situation that is characterized by political and legal changes. However, in the future, the nursery can explore the possibility of expanding its client portfolio, if the market allows it.

VARIABLES TO CONSIDER

IN THE CASE OF A LACK OF TECHNICAL ASSISTANCE

This **module** presents a series of steps that can help coffee seed producers and nurseries understand the market. However, on many occasions some of these

steps can be difficult to perform if there is not adequate technical support. In this final section, some additional strategies are presented for producers who do not have easy access to technical support.

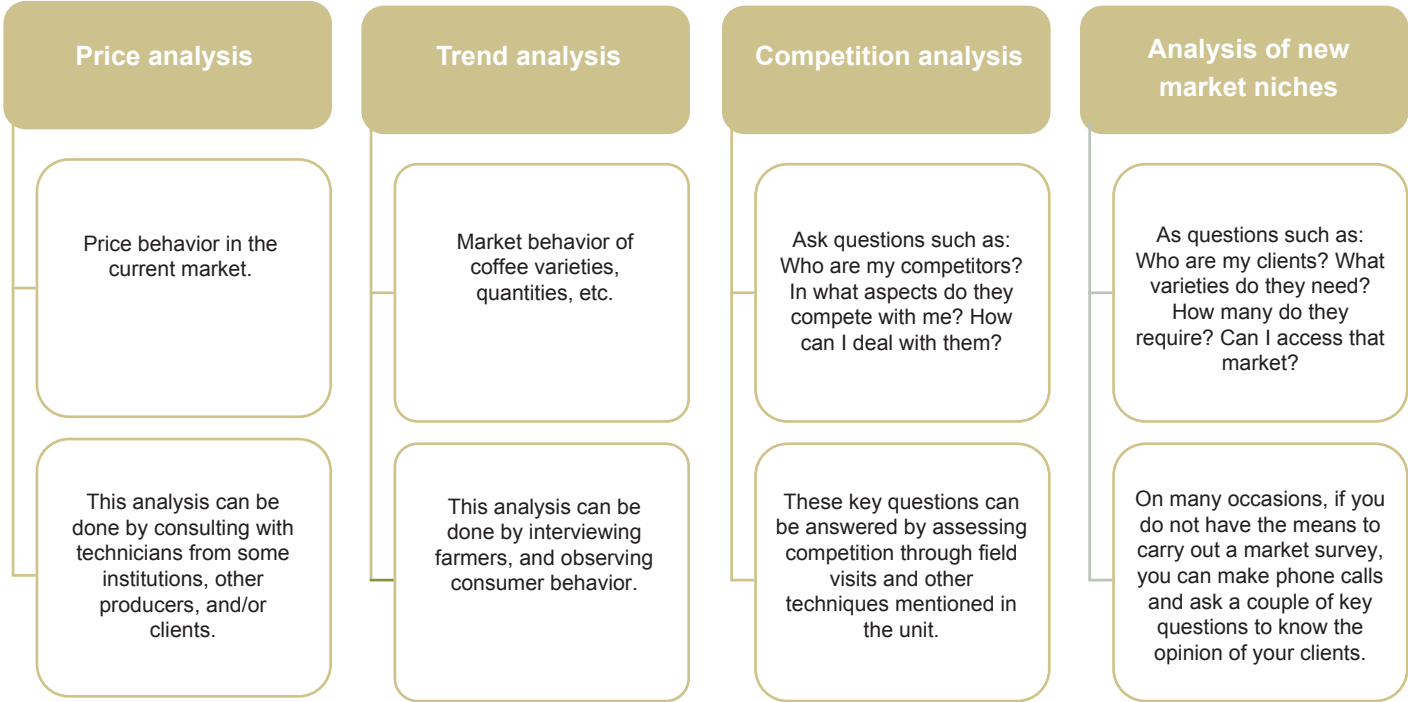


Figure 8. Main actions that producers can take if they do not have technical assistance.

COMPLEMENTARY RESOURCES

MARKET SURVEY EXAMPLES

Below are two market surveys previously prepared by the Tropical Agronomic Research and Teaching Center (CATIE, by its acronym in Spanish), which can be used by

technicians in the coffee sector, coffee seed producers and coffee seedling producers to visualize the results, and analyze the information that is produced from a market survey.

Table 4. Market survey examples.

Institution	Title	URL	QR Code
CATIE	Quick Market Survey: Fruit Pulp.	http://repositorio.bibliotecaorton.catie.ac.cr/bitstream/handle/11554/7990/54.pdf?sequence=2&isAllowed=y	
CATIE	Quick Market Survey: Noni Juice.	http://201.207.189.89/bitstream/handle/11554/7942/44.pdf?sequence=2&isAllowed=y	

ANNEXES

Annex 1. The main platforms used to create online surveys.

Platform	Description
Google Forms	Google forms are an excellent tool for creating online surveys. It's provided for free by Google to all users who have a Gmail account. This tool allows users to download each graph, table, and figures as images or as a spreadsheet.
SurveyMonkey	This platform allows you to generate online surveys. It has a free and a premium version. However, the free version does not allow you to download the results of the surveys.
Zoho Survey	Platform that allows online surveys. It has a free version, although its use is very limited (only 15 questions and a maximum of 150 answers).
Type Form	This platform has a modern aesthetic and design. You can create a free account that allows the user to create unlimited online surveys with unlimited responses. You can also download the data in a spreadsheet.
Polldaddy	This platform allows you to create online surveys through a “drag and drop” visual editor. It stands out for its visual styles, question matrices, and the inclusion of multimedia content. However, it is necessary to have a WordPress.com platform to log in.



Annex 2. Summary example of the matrix to collect information.

Source of information	Source	Type of information		Means of collection	Selection of information							Additional Details	
		Subject	Is it possible to obtain information through the source?		Select the means of collection	Type of actor to whom the information refers	Type of source (if applicable)					Additional Details	
							Source	In case of another Detail it here	Author	Year of elaboration	Meets the selection criteria		Type of information channel
Primary source		Rates											
		Quality requirements											
		Purchase-sale conditions											
		Product presentation											
		Other:											
		Technical packages											
Secondary source		Expenses											
		Competition											
		Rates											
		Possible market niches											
		Consumption habits and customs											
		Competition (internal and external)											
Complementary sources		Potential customers											
		Consumption habits and customs											

Annex 3. Example matrix of the market survey base tool

a) General data of the organization:	
ID	
Date	
Name of interviewee	
Company name	
Email	
Phone number	
Email address	
Country	
Address	
Regular workforce (number of employees)	
Temporary labor (number of employees)	

b) Basic questions to ask

Variable	Question	Answer	Comment / observation
Area	What is the productive area (m2) for the nurseries / seed lots?		
Area	What is the condition of the productive area?		
Volume	What is the amount (plants / seeds) you produce per year?		
Varieties	Which varieties do you produce?		
Rates	What is the selling price per unit?		
Rates	What factors influence the sale price?		
Competition	Who are your competitors?		
Competition	In what ways do they compete with your product?		
Expenses	What is the cost of production per unit?		
Consumption habits	What are the main months when the product is sold?		
Consumption habits	Which varieties are frequently requested?		
Trends	How have sales been in the past 3 years?		
Presentations	In what form (pots, trays, etc.) do you sell the product?		
Requirements	What must you do to acquire the product you're selling.		
Demand	Who are your main buyers?		
Demand	Is there potential for growth in demand?		
Market niches	What strengths and/or opportunities do you have ?		
Market niches	What weaknesses and / or threats do you have?		
Other data	Where do you buy the inputs you use to produce?		
Other data	Approximately, what is your annual income from production?		

c) Basic questions about demand

Variable	Question	Answer	Comment / observation
Area	Are you currently replanting your coffee farm?		
Area	Do you renew a part of the coffee farm every year?		
Area	What is the productive area (m2) that you are replanting?		
Volume	How many plants do you buy per year?		
Varieties	Do you prefer grafted or ungrafted plants?		
Rates	What is the purchase price per coffee plant?		
Rates	Which factors influence the purchase price of coffee plants?		
Competition	Who are your competitors?		
Competition	In what ways do they compete with your product?		
Expenses	What is the approximate cost to maintain the new coffee plants?		
Consumption habits	What are the main months when you buy coffee plants?		
Consumption habits	What varieties of plants do you commonly buy for replanting?		
Trends	How has the supply of plants been in the past 3 years?		
Presentations	In which presentation do you prefer to buy the product? (Pots, trays, etc.)		
Requirements	What requirements do you need from the nursery?		
Offer	What factors do you consider when looking for a plant supplier?		
Offer	Is there a growth potential in the supply of plants?		
Market niches	What strengths and/or opportunities do you have ?		
Market niches	What weaknesses and or threats do you have when buying plants from a commercial nursery?		
Other data	Where do you buy the inputs you use to produce?		
Other data	Approximately, what is your annual income from production?		

Annex 4. Example matrix for information analysis.

a) Offer analysis					
Variable	Area	Area	Volume	Varieties	Rates
Assigned questions (regarding the offer)	What is the productive area (m2) that you assign to the activity (nurseries / seed lots)?	What is the condition of the productive area?	What is the your annual production?	Which varieties do you produce?	What is the selling price per unit?
Answer 1					
Answer 2					
Answer 3					
Answer 4					
Answer 5					
Answer ...n					

b) Analysis of demand					
Variable	Area	Area	Area	Volume	Varieties
Assigned questions (regarding the offer)	Are you currently replanting your coffee farm?	Do you renew a part of the coffee farm every year?	What is the productive area (m2) that you are replanting?	What is the number of plants you buy per year?	Do you prefer grafted or ungrafted plants?
Answer 1					
Answer 2					
Answer 3					
Answer 4					
Answer 5					
Answer ...n					

Annex 5. Example matrix for identifying opportunities.

Diagnosis (test results)	Detected Opportunity	Required resources	Term of use	Follow-up	Results delivery

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MODULE 2

PLANNING FOR PRODUCTION



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INTRODUCTION

In business management, it is of utmost importance to have a good production planning process. Planning allows to businesses to effectively manage available resources, manage the flow of inputs/products/inventories, and make decisions in a timely manner.

Prior to planning production, it is necessary to know the business's production capacity and product demand. This information helps answer three crucial questions in production planning: **What should I produce? When should I produce it? How should I produce it?** By answering these questions, the company's objectives and goals can be met.

This module covers the main aspects of good coffee seed production and nursery planning through a series of eight steps. The seed producer or nursery will learn to plan for production by using tools such as: product specification, description of the production process, infrastructure, technology and equipment requirements, personnel/skillset requirements, raw material/input requirements, environmental management of production and recommended best practices. This module also covers the risks of poor production planning.

At the end of this module, the reader will have the necessary knowledge to carefully plan their production process through the use of efficient tools.



MODULE SUMMARY

Module 2: “Production Planning”, presents recommended steps for coffee technicians, coffee seed producers, and coffee seedling producers to carry out adequate production plans.

Step 1

Define the specifications of the product that the business will sell. This step demonstrates how to make a technical sheet with the characteristics of the product and/or services that are offered.

Step 2

Description of the production process with a flow diagram methodology . With it both, producers and technicians, can design the production process of seeds and coffee nurseries, in order to have a graphic representation of it.

Step 3

Description of technological, infrastructure and equipment requirements based on production capacity. This step also details the investments that must be made to carry out the production processes.

Step 4

Definition of personnel requirements and the capabilities that they must have. The different types of labor found within production are mentioned, as well as the personnel needs required in the production of seed lots and coffee seedlings

Step 5

Plan raw materials and supplies, requirements that are necessary within each of the production stages.

Step 6

Plan the environmental management of production.

Step 7

Best practices for production

Step 8

Risks of not planning production. This step also presents methods to improve the production process ..

OBJECTIVE: PLANNING FOR PRODUCTION

GENERAL OBJECTIVE

Develop the eight necessary steps to carry out adequate production planning using different methods and tools for technicians, seed producers and coffee nurseries.

SPECIFIC OBJECTIVES

- ✦ Establish flow diagrams that represent the production process, as a starting point for technical analysis and production planning.
- ✦ Define the material, technical and human resources required at each stage of the process.
- ✦ Identify aspects that may affect the implementation of the production plan, such as environmental management, good planning practices and an analysis of the risks associated with not planning production accurately.



STEP 1.

PRODUCTS AND/OR SERVICES SPECIFICATIONS

To begin a production plan, it is necessary to incorporate the information generated in the **market analysis** (explained in the previous module) as a starting point. Answering the key questions developed in Module 1 will allow for greater efficiency when planning production.

WHAT SHOULD I PRODUCE?

Currently, the production of coffee seeds and seedlings is **characterized** by a very specific product with variations in quality, price, technology, equipment, infrastructure, varieties, etc.

Generally, in Latin American countries, the seed and seedling production models that are used in the initial links of the coffee production chain are based on two main products: the production of **coffee seeds**, which are sold to nurseries or producers to grow seedlings and the production of **seedlings or seedbeds** for the establishment of new farms or for replanting farms with low productivity rates.

Each country's coffee seed and seedling supply chain is different. In some countries, the market is dominated by large companies which limits the participation of small producers. There are also examples of small producers that use associativity, through cooperatives and unions. Other producers function on the basis of individuality, through small and medium production in a market.

Product concept comprises tangible (physical) and intangible (not physical) aspects, as well as the services that a company or organization offers to its customers for their use and/or consumption.

In some cases, companies not only offer coffee seeds and seedlings, but also incorporate services such as the third-part propagation of seedlings for growers, asexual propagation (through tissue culture), plant grafting, etc. These services generate additional value for the company.

There are three levels in which products can be grouped, which are summarized in the diagram below:

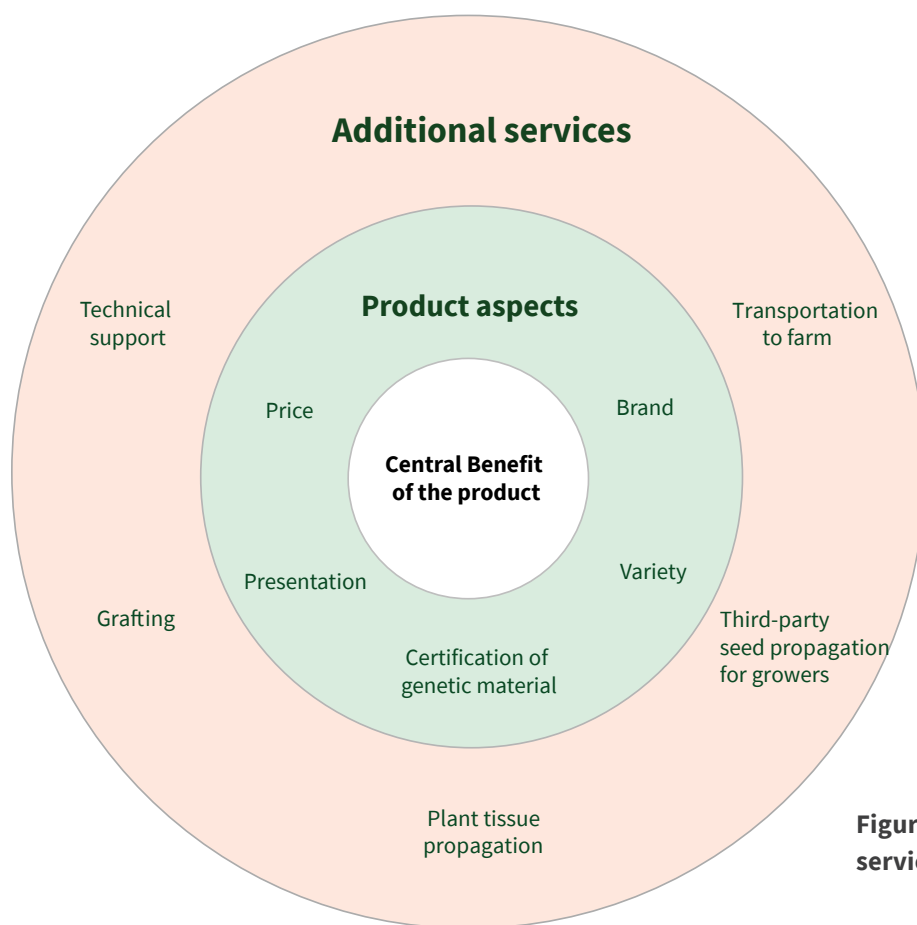


Figure 9. Product aspects and additional services diagram

In the center of the diagram above is the **product** that already supplies a defined market. This is represented by the **central benefit of the product**. For example, the main benefit that customers will obtain from a coffee seed product is the acquisition of quality seeds that can be used to produce healthy, traceable seedlings. For nursery production, customers benefit by acquiring quality seedlings that can produce high-quality coffee for approximately twenty years.

The second ring in the diagram represents the **characteristics that the product has**, such as: product certifications, the variety, and the presentation (bag, tube, micro-stakes, etc). This level is where producers distinguish themselves from their competition. Finally, the third ring represents **intangible or complementary aspects**, where other types of additional services can be offered. These services can help attract more buyers, depending on the economic capacity, the level of production, and the technical knowledge that the producer possesses.

HOW DO I IDENTIFY WHICH ARE THE DESIRABLE CHARACTERISTICS OF MY PRODUCT?

The **identification of the characteristics** that the offered product must have are obtained through the **market survey explained in module 1**, where various techniques are presented to capture the customer's opinion and, thereby, generate a product that satisfies the buyer's needs. These characteristics are then documented in the **Product Sheet**, which will be a valuable input in the production planning exercise. This file establishes the guidelines on what is being produced; while the characteristics of the product are standardized and presented, in a simple way, to customers. An example is shown below, which can be carried out by coffee seed producers and nurseries to show the characteristics of the product they are going to offer.

Table 4. Example Product Matrix Sheet.

Aspect	Product 1	Product 2
Variety	Caturra	Anacafe 14
Origin of Variety	A natural mutation of the "Borbon" variety	(Hybrid Timor 832/1 x Caturra) x Pacamara
Breeder	Agronomic Institute (IAC), Brazil	National Coffee Association (ANACAFÉ)
Intellectual Property Ownership	Public domain	Public domain
Plant Size	Low / Compact	Low / Compact
Bud Color	Green	Green
Fruit Size	Average	Very Large
Optimal Altitude	Between 1.000 to 1.600 masl	Between 700 to 1.200 masl
Cup Quality Potential	Good	Good
Productivity Potential	Good	High
Susceptibility to Anthracnose	Susceptible	Susceptible
Susceptibility to Nematodes	Susceptible	Susceptible
Susceptibility to Coffee Leaf Rust	Susceptible	Resistant
Years to First Harvest	3	2
Nutritional Requirements	High	High
Fruit Ripening Season	Average	Late
Sowing Density	5,000 to 6,000 plants per ha	4,000 to 5,000 plants per ha
Presentation (for Seedlings)	Bag / Tube	Bag / Tube
Additional Services Offered	Technical Support on the Handling of this Specific Variety	Technical Support on the Handling of this Specific Variety

Recommendation

There are several methods to obtain technical information on the variety of the product. One of them is the catalog of varieties of World Coffee Research, which can be found on the following link:

<https://varieties.worldcoffeeresearch.org>



Scan the following QR code to Download the Product Data Sheet.

This information can be found on sheet 2 "Product datasheet" of the Excel File.



STEP 2.

DESCRIPTION OF THE PRODUCTION PROCESS

Within production planning, the **definition and description of the stages that make up the production process** is extremely important,. Through these, the flow of inputs can be established to obtain expected outputs (products).

The production process for growing coffee seeds is different from the production process for growing coffee seedlings. Therefore, the description of the production process must be tailored to the form of production (seed or seedling).

When discussing the production of coffee seeds, it is necessary to note the activities required for mother plant upkeep. When discussing the production of coffee seedlings or seedbeds, it is necessary to note the series of steps that begins with the preparation of growing beds and ends with a developed seedling that is delivered to the buyer, (usually at an age of 6 to 12 months). The process flows for both the seed and seedling production processes are explained in this module.

For more information about the production of seeds and the management of coffee nurseries, you can use the link below or scan the QR code linked to WCR's *Good Practice Guide: Coffee Nursery Management* and *Good Practice Guide: Seed Producers*

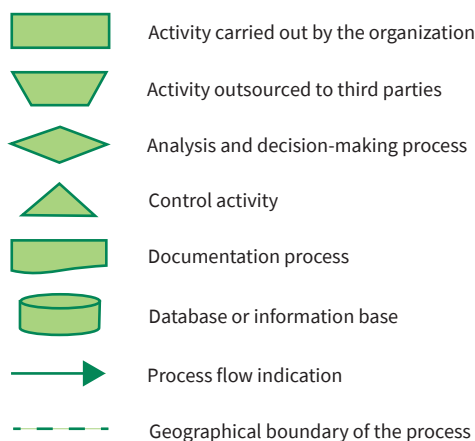
<https://worldcoffeeresearch.org/work/good-practice-guides-guía-de-buenas-practicas/>



HOW IS THE PRODUCTION PROCESS DEFINED?

To properly define a production process, one must first define the different stages that comprise it. There are different methodologies to achieve this, however, it is recommended to use **process flow diagrams or flowcharts**. These charts provide an easy way to graphically represent the flow of stages or steps in production and the inputs that each stage of the process requires in order to obtain the final product or service (outputs).

Process flow diagrams use a series of symbols to standardize and facilitate the interpretation of the production process graph. Each action in the process has a specific symbol, which is shown through an image or figure, as seen below.



Source: Umaña *et al* (2012).

Figure 10. Basic symbology used in process flow diagrams.

RECOMMENDATIONS FOR PROCESS DIAGRAM:

- 1 Be clear about each of the stages of the production process, until the final product is obtained.
- 2 Determine the location/locations where the process will be carried out and its stages. Example: Seeds are grown on a farm, but the final preparation is done in a different location using a mill.
- 3 List, the labor, supplies, machinery, equipment, etc. requirements for each stage. These are defined as “inputs” in the system.
- 4 Identify and highlight the decisions to be made for each activity (represented by “diamonds” in the diagram. Example: When a nursery buys seeds, it must first decide which varieties of coffee to purchase.
- 5 Identify if there are any stages that have quality requirements. Place “triangles” on the left side of the figure corresponding to this stage, detailing the necessary quality requirements. Example: Seed production must comply with an adequate humidity percentage and be free of pests and diseases.
- 6 Review each activity and determine which ones require some forms of documentation. Example: Coffee seed traceability documentation
- 7 Finally, the processes are connected with arrows to represent the flow order. In some cases, circles are placed to mark the beginning and end of the process.

Example of the production process diagram for producing coffee seeds

Below is a basic example of the production process diagram for the establishment of a seed production farm, using mother plants for genetic material.

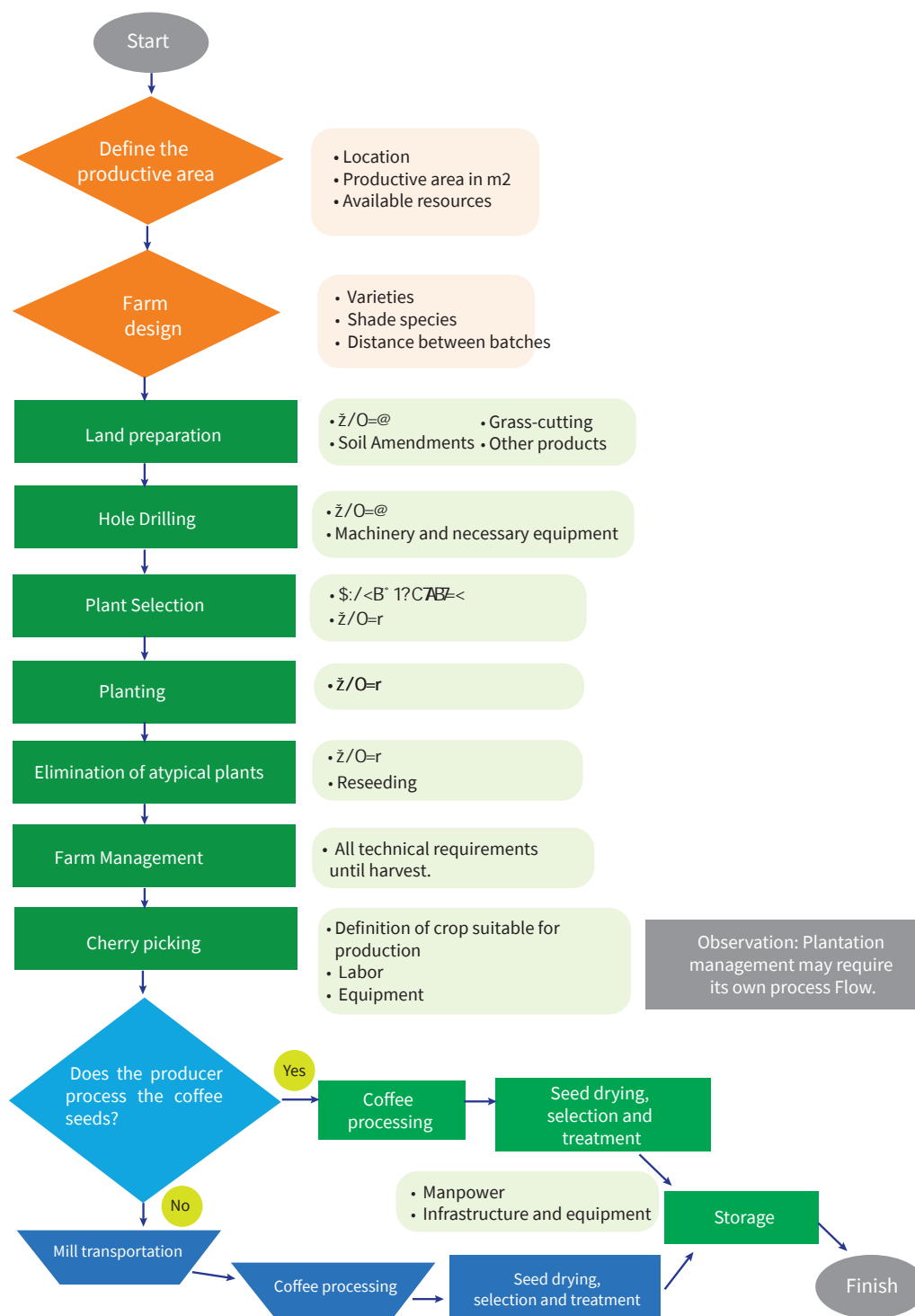


Figure 11. Example of a flow chart for the production process of coffee seeds.



To create a process flow diagram for the propagation and sale of coffee seedlings, you can use the “Guide to Good Practices in the Management of Coffee Nurseries” prepared by World Coffee Research organization, which can be found at the following link:

<https://worldcoffeeresearch.org/work/good-practice-guides-gu%C3%AD-de-buenas-pr%C3%A1cticas/>

Example of the coffee seedling production process

Below is a basic example of a coffee nursery production process diagram with the main points that must be considered at each stage.

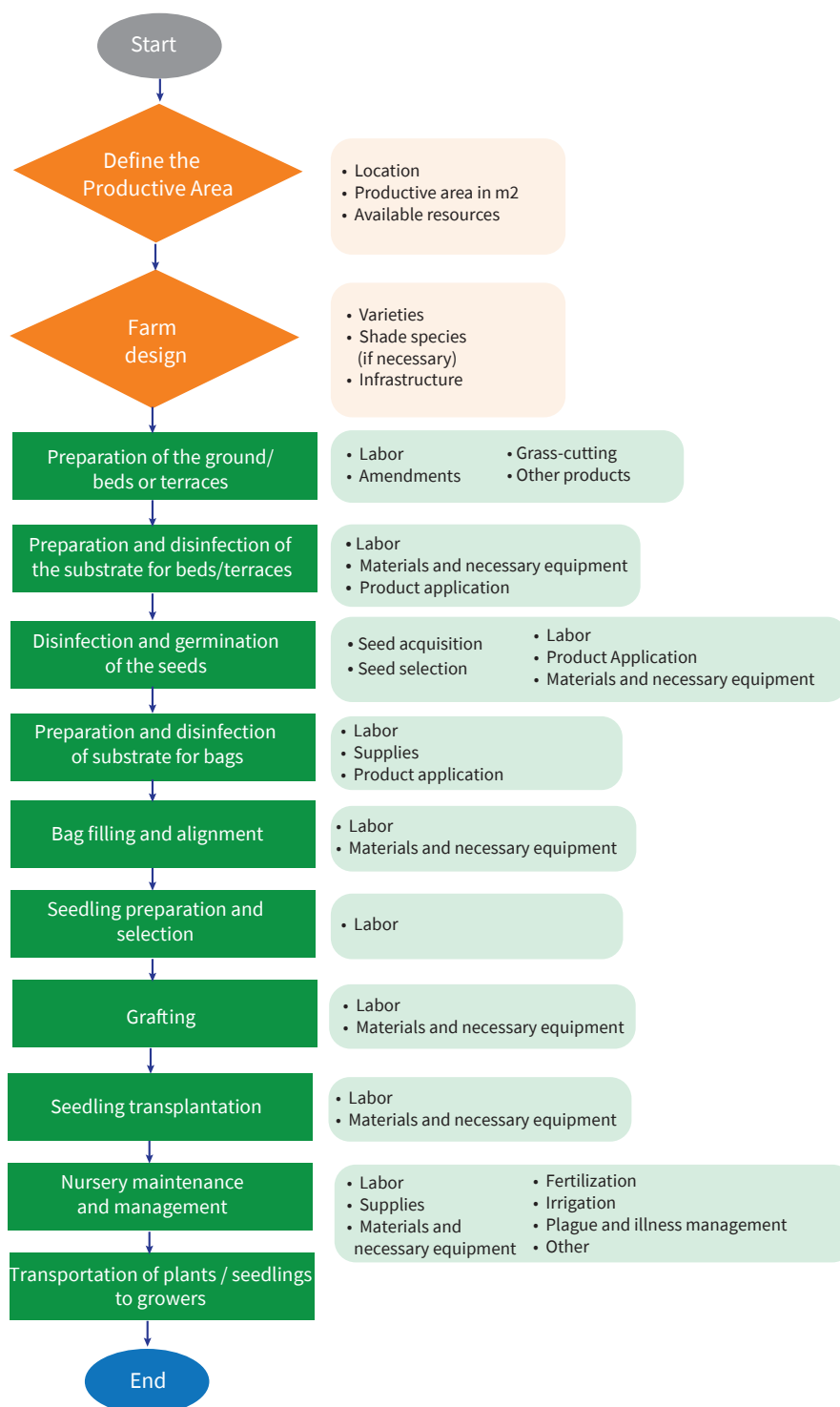


Figure 12. Example of the coffee seedling production process flow chart



To create a process flow diagram for the propagation and sale of coffee seedlings, you can use the “Guide to Good Practices in the Management of Coffee Nurseries” prepared by World Coffee Research organization, which can be found at the following link:

<https://worldcoffeeresearch.org/work/good-practice-guides-guí-de-buenas-practicas/>

How can I manage the production process?

The process diagrams can be managed through tools for producers, farm collaborators, and technicians. These tools allow each individual the ability to identify and follow up on each of the processes. The following table demonstrates an example.

This section describes the diagrammed procedure

Abbreviation for the process being performed

ACTIVITIES DIAGRAM









Procedure: Process flow of coffee nursery production

Code: VC

Produced by:

Procedure: Preparation of seedlings for planting

Code: VC

Code:	Description	ACTIVITIES				Observations
VC-1	Define the productive area					
VC-2	Farm Planting Design					
VC-3	Tray filling					
VC-4	Preparation of the ground/beds/terraces					

This section details each of the processes or activities, which will have a code that is derived from the initial code.

Source: Central American Institute of Public Administration (2001).

Figure 13. Example of an activity diagram spreadsheet.



Download the Excel tool [here](#) or scan the following QR code to design the production process.

This information can be found on the sheet “3. Data sheet on the production process.” of the Excel tool.



STEP 3.

TECHNOLOGY DESCRIPTION AND INFRASTRUCTURE/EQUIPMENT REQUIREMENTS

Once the production process has been described (previous step), the business's **equipment investment** such as: technology, machinery, vehicles, furniture, etc. must be defined. These tools are necessary in the development of the production stages.

However, before describing the technological, infrastructure, and equipment requirements, it is necessary to define the

production capacity and the location of the production process.

HOW DO I DEFINE THE PRODUCTION CAPACITY?

The production capacity is defined by the **maximum amount of goods or services** that can be obtained from the existing productive unit, during a given period. For example, the amount of seedlings that can be produced in a year by a nursery (the productive area is the size of the nursery) or the amount of seeds that can be produced by a batch of mother plants, for a specific period, according to the size and the lot harvest e



On many occasions, the term production capacity tends to be confused with production volume. The difference is that **productive capacity**, as mentioned earlier, refers to the maximum amount of goods that can be produced per productive unit, while production volume refers to the amount of goods and services that a productive unit can generate with the resources available to the producer.

Example of the difference between productive capacity and productive volume:

A nursery has a 100m² lot. However, the nursery is only using half (50m²) of the land, even though they have demand from their clients that would allow them to supply more coffee seedlings to coffee growers, they do not have the economic resources to expand the infrastructure of the nursery. In this case, the productive capacity is the maximum amount of production possible when all the space is utilized, while the production volume is the amount of seedlings that are currently being produced with current resources. Other possible limitations that could exist are the lack of equipment, labor or inputs such as substrate or seed.

The production capacity estimate is **crucial**, since businesses are often oversized, thereby presenting **risks** such as:

- ✦ Producing more than what the market needs, which can incur product losses. For example, a nursery can produce 20,000 coffee seedlings, but only manage to sell 15,000 on the market.
- ✦ There is technology, infrastructure, or equipment with a large productive capacity, but they work well below their capacity, because there is not much demand. This increases the costs of the final product. For example, a nursery that has a large technological capacity, with a greenhouse equipped with an irrigation system that allows for the production and maintenance of a maximum of 200,000 coffee seedlings, but, due to a lack of demand, they only produce 100,000 seedlings. Therefore, the greenhouse is left underused.

WHAT FACTORS MUST BE CONSIDERED TO DETERMINE THE PRODUCTIVE CAPACITY?

In order to determine the productive capacity of a project, it is necessary to carry out an analysis of **the aspects that affect** a company's production process. These aspects can enhance or limit the productive capacity.

Note:

You can calculate the utilization rate of the productive capacity through the following formula:

$$\frac{\text{Amount of produced units}}{\text{Total amount of units that can be produced}} = \text{Production capacity utilization rate}$$

Land use rate can be calculated via the formula below:

$$\frac{\text{Area used for production}}{\text{Total land area}} * 100 = \text{Land use rate}$$

Example: A nursery has the capacity to produce 7,000,000 seedlings per year. However, they currently only produce 4,000,000 seedlings, due to the market demand. When applying the first production capacity utilization rate formula, one can determine that the nursery is only utilizing 57.14 % of its production capacity.

$$\text{Productive capacity rate} = \frac{4,000,000}{7,000,000} * 100$$

$$\text{Productive capacity rate} = 57.14\%$$

The factors that affect productive capacity are divided into two categories: **internal factors**, which are linked to the individual capacities of each producer, and **external factors**, which are associated with activities that do not depend on the producer. The main factors include the following:

Internal factors	External factors
<ul style="list-style-type: none"> Financial Resources Market demand. Availability of raw materials and supplies. Human capital (Knowledge and experience). 	<ul style="list-style-type: none"> Business competition. Political environment (current legislation). The weather.

Figure 14. Examples of internal and external factors that affect agricultural production.

Internal factors

Market Demand

Market demand is concerned with the supply of products, which is one of the factors that influences the size of the market. The market may have a demand that is not yet satisfied or a demand that is over-satisfied.

Producer production capacity must be linked to the market demand. This can be inferred from the information generated in the **market survey** (module 1). The production volume should never be greater than the demand, to avoid not being able to sell all the product, as this will mean losses for the producer. That is why coffee seed producers and nurseries must determine their optimal productive capacity to produce a volume according to demand.

Availability of raw materials and supplies

The availability of raw materials and supplies is one of the key factors for the production process, since it is necessary to have an **adequate supply**, in terms of quality and quantity, so that each of the productive stages can be successfully achieved.

On the other hand, it is necessary to know different sources or suppliers from where the necessary material can be obtained, for each stage of the production process, in order to **reduce risk** in the acquisition of raw materials and supplies. This is a critical step for nurseries to satisfy the delivery commitments of plants or seeds that are under contract for purchase by coffee growers or nurseries.

Financial resources

The availability of financial resources influences the production capacity, since they determine the **investment and working capital needs** that are required to carry out the production process.

There are various sources of financial resources, including:

- 🌱 **Personal capital:** It comes from the own resources of each producer.
- 🌱 **Financed capital:** It comes from resources acquired through debts before different credit institutions and suppliers.

State support: Resources provided by the state to the producer to promote production.

Note:

A good practice carried out by some coffee nursery producers is to create a contract with a coffee grower for the number of seedlings that will be required for the following year. This helps producers determine the volume of production for that cycle and, thus, the necessary labor, supplies, and materials needed for that growing season.

At the time of agreement with the coffee grower, you can make a contract or request advanced payment of a percentage of the value of the plants as a “pledge”.



Human capital

The workers within an organization are critical in the development of each production stage.

Knowledge and experience are two crucial factors since value is given to the company through the workers, and it allows the company to achieve the established objectives.




External factors

On the other hand, the external factors detailed in figure 14 are those that influence or affect agricultural production, and that make it difficult for the producer to have greater control.

Business competition

Business competition is a determining factor within agribusiness, since there are **competing companies** in the market that offer their product to the same customers or market segments.

Competition is a difficult factor to control. However, there are several strategies that producers can use to compete and obtain market share. For example:

-  **Cost competition:** It is reflected in companies that, due to their productive level, implement a model of economies of scale, which favors them when buying supplies and materials. It is also seen in companies with high technological levels, that allow them to have a lower production cost than their competition and offer a product with a better price for the customer.
-  **Competition for quality:** It occurs through the generation of a value in the marketed product which, due to its quality criteria, generates customer satisfaction and, with it, loyalty. An example is when a nursery is recognized for providing coffee seedlings with good genetic quality.
-  **Competition for differentiation:** It is given through an added value in production. An example of this is when additional services are offered such as: grafting, transportation service, tissue culture, etc.

Political environment

Government policy is a factor that affects agricultural production since it can **limit the market or prevent entry into a productive sector**, through licensing requirements and limits on access to raw materials. For example, in some countries governments buy seedlings from coffee nurseries for coffee farm renewal programs, which has generated a level of dependence on government purchases.

Climatic factors

Weather conditions are a factor that creates a risk in the broader agricultural sector. Changes in temperature, the environment, and water scarcity mean that businesses must adapt to changing conditions. When there are changes in the temperature and the environment, there is an increased need for irrigation and fertilizers alongside changes in the application of insecticides, fungicides, and others. This implies an increase in costs to maintain productivity, avoid water stress, and control pests/diseases.

WHERE IS THE PRODUCTION PROCESS PERFORMED?

The location of the production process is one of the most important decisions in production planning. In general, coffee seed producers and nurseries carry out their activities in areas that have historically been centers of coffee production, due to their proximity to inputs, labor and the buyer (coffee grower). However, there are also other factors to consider when making this decision.

These aspects can be evaluated using the format below, which shows a series of factors that affect the location of production. In the column “Condition”, three criteria are provided (Mandatory, Recommended and Desirable). Depending on the “Condition” of each factor, the ease of resolving the issue will vary. The condition categorized as “Mandatory” means that the factor must always be met, for the location to be adequate. For the factors that present the condition of “Recommended” and “Desirable”, it may be easier to find a solution.

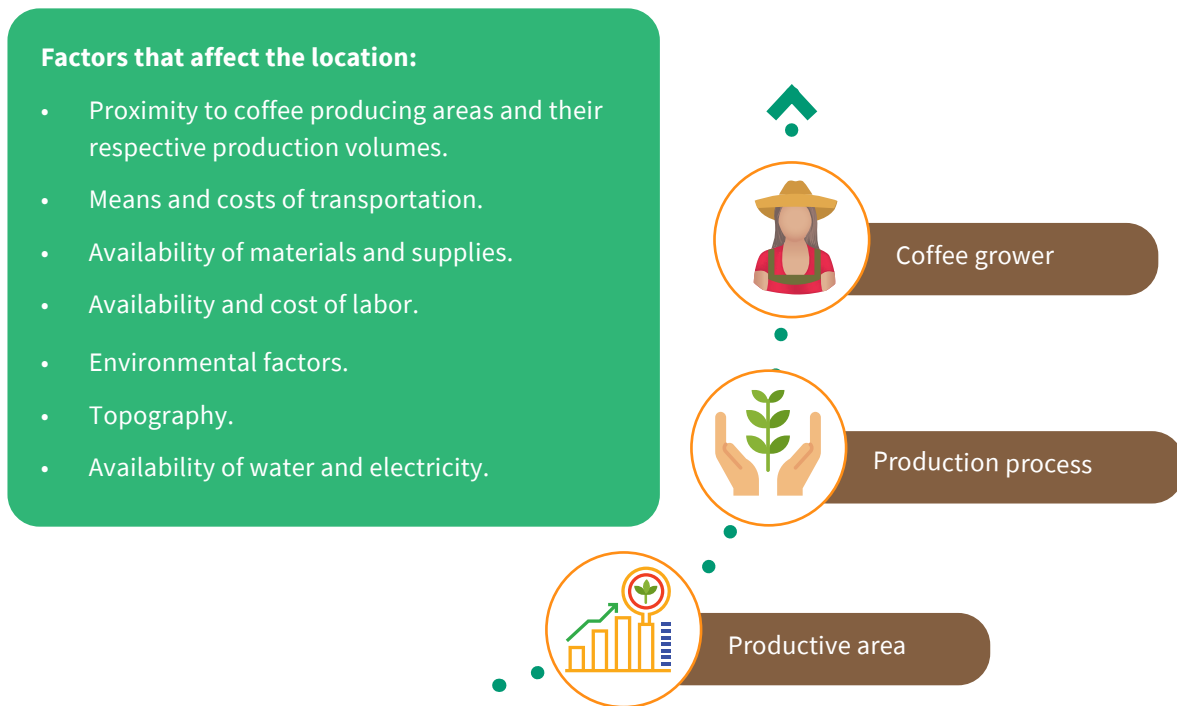


Figure 15. Example of a matrix to assess the factors that affect the location.

Table 5. Example of a matrix to assess the factors that affect the location.

Factor	Condition	Complies/Does not comply	Can I resolve this issues?	Other Observations
Labor availability	Strongly recommended			
Availability of land (owned, rented, & loaned)	Mandatory			
Availability of inputs and raw materials	Strongly recommended			
Availability of services (water and electricity)	Mandatory			
Transportation availability	Desirable			
Geographic access to centers of production	Strongly recommended			
Market proximity	Strongly recommended			



Download [here](#) the Excel tool or scan the following QR code to evaluate the localization factors.

This information can be found in sheet “4. Localization” of the Excel tool.



WHICH TECHNOLOGIES ARE REQUIRED FOR PRODUCTION?

The **technological requirements for production** can be decided after determining the capacity and location of the production unit. To determine the technologies required in the production process, it is necessary to evaluate the needs outlined in the market survey (module 1), such as: varieties, product presentation, etc. After evaluating these needs, it will be easier to determine production volume and technological requirements such as: machinery, infrastructure, and equipment.

Which factors influence the choice of technology?

To select determine proper technological requirements, the following aspects must be considered:

- 🔧 Availability and relevance according to existing needs.
- 🔧 Ease of acquisition.
- 🔧 Economic resources available to the producer.

- 🔧 Technical aspects such as training for personnel, equipment, and facilities.
- 🔧 The product demand in the area.

After outlining these factors, you can develop a **plan of technological needs**. This is an excellent starting point for creating cost estimates or evaluating the equipment that is currently owned.

An important concept to consider is **depreciation**, which refers to the loss of value in a property or asset (for example: facilities, equipment, machinery) as time passes (during its useful life). This concept is important because, when assets reach the end of their useful life, there is a cost in replacing them that is often not visible in the day-to-day operations (ex: replacing a 25 year old tractor). The matrix below provides a tool for assessment of technological requirements that are needed for proper production and operations.

Table 6. Example of a matrix to assess the technological requirements of production.

Investment	Quantity	Do you have this asset?	Condition and maintenance cost	Unit cost	Total cost	Technical service life
Machinery						
Tractor	1	Yes	Recently acquired	\$53.000	\$53.000	22 years
Bag filler						
Other Equipment						
Heating/Cooling Systems						
Irrigation systems						
Fertilizer pumps						
Other:						
Infrastructure						
Greenhouse						
Beds for bags/tubes						
Other:						
Vehicles						
Truck						
Other:						



Download [here](#) Excel tool or scan the following QR code to assess technology requirements.

This information can be found on sheet “5. Technology Req.” from the Excel tool.



STEP 4.

LABOR REQUIREMENTS AND COMPETENCES

Proper labor is necessary for the operation and management of businesses, since it provides them with the **necessary skills** to effectively achieve each of the functions in the different stages of the production process.

Human capital is **the most important asset of any company**. If there is no staff within each production unit, the process simply cannot be carried out. Therefore, it is critical that the staff have the necessary skills to adequately perform all of the functions delegated to them.

The analysis of the personnel requirements and their skills is **intimately tied to the production process** in matters such as technology, infrastructure, and equipment. Therefore, it is important to carry out the previous steps before defining the human resources.

WHAT KIND OF REQUIREMENTS AND SKILLS ARE NEEDED?

The requirements for staff skills and proficiencies will depend on the **size and level of modernization** of production. Before starting the work, it is important to estimate the personnel that is needed. The following steps outline this process:

1. Based on the process diagram outlined in the previous step, it is necessary to carry out an analysis of the needs (quantity to be produced and technological alternatives such as machinery, infrastructure, and equipment) of each stage of the business operation, in order to detail what staff functions and competencies are required.

2. Determine where it is necessary to have qualified labor and define areas of production where permanent and temporary labor is required.

3. Likewise, it is important to determine whether some activities can be completed using in-house labor vs hiring third-party labor.

DIFFERENCES BETWEEN CAPACITIES AND REQUIREMENTS

Before detailing personnel capacities and requirements for the production of seeds and coffee nurseries, it is necessary to be clear about the difference between the different forms of **labor** that can be used in production, summarized below:

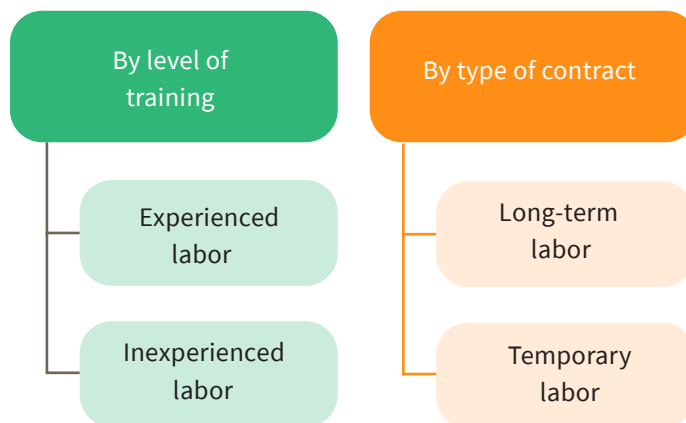


Figure 16. Types of labor that can be found within agricultural production.

By level of training

- 🔧 **Experienced labor:** Personnel characterized by having little to no technical knowledge or experience.
- 🔧 **Inexperienced labor:** Personnel characterized by having a degree of technical knowledge and experience.

By type of contract

- 🔧 **Long-term labor:** Personnel who have a labor contract for a certain period of time, which assigns them a fixed work schedule within the production process.
- 🔧 **Temporary labor:** Personnel hired for a specific period of time to carry out certain jobs within the production process.

There are different types of personnel that are required for production tasks such as: at the field operational level (laborers), at the technical management level (engineers) and at the administrative level (administrators, accountants, etc). However, not all production processes will require staff in this fixed manner since requirements vary according to the size and capacity of each company.

Personnel requirement at the administrative level and contracted services

Administrative personnel are in charge of carrying out functions such as organizing tasks, accounting, making payments/contracts, and other administrative functions. Smaller nurseries/seed producers may only require the owner to perform administrative functions. On other occasions (particularly for larger operations) there are secretaries, support technicians, and others who are also part of this staff.

The hiring of legal and accounting services is necessary, regardless of productive capacity. For larger companies, these positions can be full-time. Small and medium-sized producers usually hire services such as accounting once a month and, sporadically, legal services.

The salaries of administrative personnel can be considered an administrative expense, which are fixed expenses that cannot be directly linked to the economic activity that the company develops within its production process.

Requirements for technical personnel

Coffee seedling producers and nurseries must have **technical knowledge** to manage the productive unit. The characteristics of the personnel required for each of the stages depend on conditions, such as capacity and size of production. Many larger companies have agronomists on staff. However, small and medium producers rarely have this support on a constant basis, so they generally hire services a few times a year. Some material suppliers will provide technical support. Other times, producers can receive technical assistance from state programs, Non-Governmental Organizations (NGOs), and/or cooperative (co-op) projects or unions.

Field operating personnel requirement

Field operating personnel (laborers) will be classified as the manpower that is hired as permanent or temporary labor for each of the stages in the production process.

1. Personnel requirements and skills necessary in the production of coffee seeds

For the production of coffee seeds, it is necessary to have personnel in charge of carrying out the functions in each stage, previously defined in the process flow. The example below demonstrates the **main personnel profiles** that are necessary for seed production, from the sowing of the **mother plants** to the management of the productive seed lots. It should be noted that the following profiles were prepared based on the main activities carried out in the production of coffee seeds, with information obtained from interviews with producers, opinions from technicians, and the guide prepared by the IHCAFE seen below (2011).

This link leads to the “Guide for the determination of production costs in coffee” prepared by the IHCAFE (2011)

<https://es.slideshare.net/diosorto/libro-guia-costos-cafe-10370007>



Activity 1: Preparing the land.

Requirements and competencies:

Personnel with experience in plotting the terrain and an unqualified helper.

Requirements for 7000 m² of land:

4 laborers for 3 days for the layout (skilled manpower).

3 days for the construction of 700 stakes and support in the layout.



Activity 2: Making holes in the ground and applying fertilizer to the holes.

Requirements and competencies:

Unqualified personnel.

This activity can be carried out by permanent labor or by contracted labor



Activity 3: Planting

Requirements and competencies:

Experienced staff to ensure good planting.

Requirements for sowing 3500 plants:

17 skilled laborers (hauling, distribution, and planting). An experienced worker can plant 150-200 plants per day.



Activity 4: Weed control.

Requirements and competencies:

Unqualified personnel.

In general, three cleanings are carried out per year. More cleanings may be necessary depending on the type of terrain and frequency of rains.



Activity 5: Fertilizer application.

Requirements and competencies:

Personnel with experience and knowledge in preparation of agricultural inputs.

Requirements for 7000m² of land:

4 laborers per day for the application of fertilizers.

At least 3 applications per year, according to soil analysis.



Activity 6: Application of fungicides, herbicides, and other agrochemicals.

Requirements and competencies:

Qualified personnel.

For this activity, it is necessary to have knowledge in the preparation of fungicide, herbicide, and agrochemical solutions as well as the use of tools, such as pumps.



Activity 7: Maintenance fertilization and replanting during vegetative development.

Requirements and competencies:

Unqualified personnel.

Requirements for 7000m² of land

At least 3 applications per year, according to soil analysis. One laborer per day for replanting (when 5 % of plants are to be replaced).



Activity 8: Pruning coffee seedlings.

Requirements and competencies:

Qualified personnel.

If mechanized, only one worker is necessary.

An experienced worker can prune approximately 200 plants per day.

Note: Generally, pruning begins during the plant's fourth or fifth year, depending on the variety. Some varieties can wait until the 7th year.



Activity 9: Leaf removal and shade management.

Requirements and competencies:

Qualified personnel.

Experience in recognizing healthy, vigorous seedlings in proper positions, as well as knowledge in handling the shade coverage.

Wages depend on the type of shade system that has been selected for the farm.



Activity 10: Cherry picking.

Requirements and competencies:

Qualified personnel with experience in the recognition of coffee fruits suitable for seed production.

Temporary manpower is usually hired.



2. Personnel requirements and skills necessary in the production of coffee nurseries.

Coffee nurseries require the labor of people with the knowledge and requirements needed for the development of each of the activities. Below is an example of the **main profiles that are required to establish best practices for coffee nurseries**. There may be variations depending on the size of the productive unit and the technological level handled by the producer. It should be noted that the following profiles were based on the main activities carried out in coffee nursery production, with information obtained from interviews with producers, opinions of technicians, and the guide prepared by IHCAFE (2011).

In the following link, you can find the “*Guide for the determination of costs in coffee production*” prepared by the IHCAFE (2011).

<https://es.slideshare.net/diosorto/libro-guia-costos-cafe-10370007>



Activity 1: Preparation of soil and planting beds

Requirements and competencies:

Qualified personnel.

Experience in soil preparation and/or making seedbeds or terraces.



Activity 2: Construction of greenhouses and/or other structures.

Requirements and competencies:

Qualified Personnel.

Experience in the preparation of greenhouses (if used) or other forms of propagation infrastructure in order to provide the seedlings with an ideal environment for their development.



Activity 3: Preparation of the substrate seedlings

Requirements and competencies:

Qualified personnel.

Experience in preparing a substrate mix



Activity 4: Seedling bag filling with substrate mix

Requirements and competencies:

Unqualified personnel.

Seasonal labor is generally hired for this activity.



Activity 5: Grafting process.

Requirements and competencies:

Unqualified personnel.

A trained person can graft 800 to 1,200 seedlings daily.



Activity 6: Seedling transplantation.

Requirements and competencies:

Qualified personnel.

Experience in transplantation and selection of plants without nematodes and with adequate roots. Plants are disinfected before sowing.

An experienced person can transplant 1000 seedlings per day.



Activity 7: Application of foliar products and edaphic fertilization (fungicides, insecticides, fertilizers).

Requirements and competencies:

Qualified personnel.

Must have knowledge in the management of agricultural inputs and doses for application.

An experienced person can fertilize approximately 800 plants, drenching them for 45 minutes with a 20-liter pump.

Edaphic fertilization is done manually.



Activity 8: Weed control.

Requirements and competencies:

Unqualified personnel.

Cleaning of rows inside the nursery and application of herbicides, when applicable.

Manual weeding in coffee seedling bags.



Activity 9: Irrigation.

Requirements and competencies:

Qualified personnel for irrigation systems. When irrigation is done by application through backpack pumps, it is not necessary to have qualified personnel.



TOOL

Below is a sample table with the necessary aspects to balance and assess personnel requirements.

Table 7. Example matrix to assess staff requirements.

Type of staff (permanent / temporary)	Position	Duties	Number of people	Competences or requirements	Qualified / Unqualified	Current salary (monthly, per day or per unit (in the case of filling bags))
Permanent	Administrator	In charge of personnel, directs resources and efforts to fulfill the company objectives	1	Professional in the area of administration or agronomy	Qualified	\$2,000 per month*

* Salaries vary by country and are often governed by local law.



Download [here](#) the Excel tool or scan the following QR code to set staff requirements.

This information can be found on sheet "6. Staff Req." from the Excel tool.



STEP 5.

REQUIREMENTS FOR RAW MATERIAL AND OTHER SUPPLIES

The **requirements for raw materials and other inputs, at each stage of the process**, should be analyzed as part of the production planning, these are part of the **variable costs** and are necessary to satisfy the establishment and maintenance needs for batches of mother plants, to produce coffee seeds, or for coffee seedlings produced in nurseries.

How are raw material and input requirements defined?

In order to define them, it is necessary to **prepare** the flow diagram of the production process (Figure 11 and 12) and the specifications of the products offered (as illustrated in

table 4, page 33) since the specific needs of each stage are defined in these.

Similarly, the requirements for raw materials and **inputs vary depending on the size and level of technology** used by the production unit. Below is an example of the minimum requirements for farms focused on the production of seeds, as well as the minimum necessary requirements for the production of coffee nurseries, in terms of raw materials and inputs.

Minimum necessary requirements for raw materials and inputs to produce coffee seeds

The main products are shown below (raw materials and supplies necessary for the establishment and maintenance of coffee seed lots).

Table 8. Summary of the main products needed in the production of coffee seed lots.

Activity	Raw material and supplies	Function	Supplier
Soil preparation	Improvement	Nutritional source and pH correction	Trading companies
Temporary and/or permanent shade	Seedlings / Seeds / Stakes	Regulation of temperature and humidity in the coffee farm	Nurseries or trading companies
Sowing of the mother plants	Seedlings	Active biological planting	Coffee institutes, commercial nurseries, etc; which offer plants with traceable genetic lineage
Fertilization	Chemical or organic fertilizers	Application of nutrients for plant development	Trading companies, unions, or the producer (for example, the production of bioferments)
Lot Cleaning (Weed Control)	Herbicides, spray pump, strimmer, machete.	Weed removal	Trading companies, unions, or the producer (in case of being manual)
Disease Control	Fungicides, spray pump	Preventive and / or curative applications against diseases caused by fungi or bacteria	Trading companies
Pest control	Insecticides (natural or inorganic), spray pumps, traps	Control insect pests that may occur within production	Trading companies
Farm maintenance	Tools such as: Machete, Hoe, spray pumps, planting knife, saws, shovel, among others.	Necessary for various activities within production, such as: clearing, tilling, digging, preparing the land, pruning, etc.	Trading companies

If you want to know more about applications, doses and handling of supplies and raw materials, you can visit the following links:

<https://worldcoffeeresearch.org/work/good-practice-guides-gu%C3%AD-de-buenas-practicas/>

<http://www.inifapcirne.gob.mx/Biblioteca/Paquetes2012/81.pdf>



MINIMUM NECESSARY REQUIREMENTS FOR RAW MATERIAL AND SUPPLIES TO PRODUCE COFFEE SEEDLINGS OR NURSERIES

The main products are shown below (raw material and inputs necessary to produce coffee seedlings).

Table 9. Summary of the main products that are needed within the production of coffee nurseries.

Activity	Raw material and supplies	Function	Supplier
Preparation of beds / terraces	Various materials for construction (wood, bamboo, concrete blocks, etc.). Various materials for the substrate (peat, sand, etc.).	Seed germination.	Trading companies
Planting and shade installation	Posts or shade nets	Protection of coffee seedlings	Nurseries
Trading companies	Sand, stone, peat, compost, rice pellets, etc.	Coffee seedling growth and protection	Trading companies, producing farms
Preparation of the substrate for bags	Sand, stone, peat, compost, rice pellets, etc.	Growth and support of the plant	Trading companies, producing farms
Substrate disinfection	Metal buckets, chemicals, transparent plastic (varies by technique)	Mitigate the negative impact of fungi, nematodes, insects, bacteria and volunteer (weed) seeds.	Trading companies
Sowing in terraces or germination beds	Seeds	Active planting.	Coffee Institutes, Trading Companies
Planting the seedling in containers	Smaller plastic tubes and trays	Final container for the sale of seedlings	Trading companies
Irrigation	Irrigation system, watering cans, hose, sprinklers, etc.	Seedling watering/irrigation.	Trading companies
Fertilization	Fertilizers, spray pumps (for foliar spraying or fertilizer drenching)	Additional nutrients for plant development.	Trading companies
Cleaning Plant Rows (Weed Control)	Herbicides, spray pump.	Weed removal.	Trading companies
Disease Control	Bactericidal fungicides, spray pump	Preventive and / or curative applications against diseases caused by fungi	Trading companies
Pest control	Insecticides (natural or chemical), spray pump.	Controls pests that may cause issues in the nursery	Trading companies
Nursery maintenance	Tools such as: shovels, trucks, irrigation, hoses, etc.	These are necessary for various activities within production, such as: bag filling, substrate mixing, irrigation, among others.	Trading companies

If you want to know more about applications, doses and handling of supplies and raw materials, you can visit the following links:

<https://worldcoffeeresearch.org/work/good-practice-guides-gu%C3%AD-de-buenas-practicas/>



<http://www.inifapcirne.gob.mx/Biblioteca/Paquetes2012/80.pdf>



How do I analyze the requirements for raw materials and supplies?

Matrices can be used to analyze and determine the requirements for raw materials and inputs. This allows for greater control over the direct costs of production, such as the ones shown below.

Table 10. Example of a matrix used to analyze and determine the requirements for raw materials and supplies.

Production process activity	Type of raw materials and/or inputs	When is this raw material and / or input required?	When is this raw material and / or input required?	Quantity	Unit cost	Total cost	Supplier	Services offered by the supplier
Bag filling	6 x 8 plastic bags (thousand pack)	After the germination process (40-60 days)	Unit (thousands)	100	\$3.5	\$350	Commercial enterprise	Technical consulting



Download [here](#) the Excel tool or scan the following QR code to discover raw material and input requirements.
This information can be found on sheet “7. RM and Input Req.”



STEP 6.

ENVIRONMENTAL MANAGEMENT DURING PRODUCTION

The production of seeds and coffee seedlings, like any operation, should have an **adequate administration of environmental management**. On some occasions, the owners of agricultural production companies carry out Environmental Impact Studies as part of their obligations or requirements. The objective of implementing adequate environmental management in production is to try to develop the process in a sustainable way, through responsible mechanisms that ensure an adequate management of waste, inputs and the reasonable use of resources (such as water and soil) that are essential for any agribusiness to develop.

WHICH PRACTICES CAN BE CARRIED OUT WITHIN THE PRODUCTION PROCESS?

To achieve proper environmental management during production, it is necessary to implement the concept of **Good Agricultural Practices**, which refers to the principles, standards and recommendations that can be applied, in the different stages of the production process in order to ensure human and environmental health, through ecologically safe and economically feasible methods.

Within the production of seeds and coffee nurseries, some Good Agricultural Practices that affect environmental management are:

1. Proper handling of fertilizers: The use and management of different fertilizers should be implemented according to the need of mother plants (for seed production). Fertilization requirements for mother plant fields must be adjusted according to coffee variety, soil analysis and harvest estimation. Before planning fertilization, it is necessary to carry out a soil or substrate analysis to determine the necessary fertilizer inputs and avoid overfertilisation. An excess of fertilizers can contaminate the water table and affect the fertility of the soil, in addition to causing economic losses. The particular requirements for specific coffee varieties must also be considered. One good fertilization practice for nursery production is the use of organic byproducts from coffee activity (such as the coffee pulp) to generate organic fertilizers, which are applied in the preparation of substrates or to seedlings in the field. In the nursery,

soil fertilization is most efficient when fertilizer is applied to each bag. This is more preferable than a broad application of fertilizer across all bags that can result in the waste of fertilizer inputs.

- 2. Soil and / or substrate management:** Soil management, especially in lots that are used to produce coffee seeds, must be carried out in a way that avoids erosion, compaction, and salinization of the soil. The establishment of mulches (live or dead) is recommended to protect the soil and reduce weed growth. In the same way, it is advised to carry out a soil analysis every two years, to see the constant evolution in soil composition and characteristics. This allows for the proper application of fertilizers. Additional recommended actions include: creating adequate drainage, planting cover crops, contour farming, and other soil conservation practices.
- 3. Handling and application of phytosanitary products:** Phytosanitary products are especially useful in the mitigation and minimization of the negative impacts generated by pests and diseases. The pests and diseases that affect coffee vary widely. These pests and diseases cause damage to crops and coffee plants. There are phytosanitary products to control their effect, which can be chemical or organic. Using an Integrated Pest and Disease Management Plan (IPM) guarantees that the use of these products is safe for both people and the environment. It is important to emphasize that even organic products can have a certain degree of toxicity, and should be used according to the manufacturer's recommendations.
- 4. Selection and production of seeds:** All seeds utilized in the establishment of seed lots should be procured from nurseries that are registered or authorized as producers of certified or verified seeds. However, in some countries, there are no authorities in charge of regulating the genetic material and this option is not available. In such cases, it is recommended that the producer inquire as much as possible about the origin of the seed that they will use. It is also important to maintain a healthy seed lot, free of pests and diseases. Future risks for producers will be reduced if it is possible to be certain of the purity and the phytosanitary state of the seeds.

5. Water resource management: The efficient use of water is one of the most important practices in any coffee production system. There are different methods that can be used to reduce the use of this resource such as: monitoring and maintaining irrigation systems to avoid leaks or waste, protecting springs, and recharge areas via forest cover, using reservoirs for water catchment, and avoiding overwatering, etc.

HOW CAN I EVALUATE THE ENVIRONMENTAL MANAGEMENT OF A PRODUCTION SYSTEM?

One of the best ways to evaluate the environmental management of agribusiness is through risk matrices. This type of matrix efficiently assesses any possible environmental risks that may arise. This also helps prepare for the implementation of necessary actions to help resolve any potential problems.

Table 11. Example of a matrix to assess the risks associated with production.

Productive stage	Type of threat (Natural or human caused)	Causes	Consequences	Vulnerable elements	Actions to take
Sowing	Human caused	Weed removal	Alteration of the landscape Soil erosion Soil detachment Habitat removal	Flora and fauna	Installation of shade cover, contour farming, etc.
Crop maintenance	Human caused	Control of pests and diseases	Residual content of applied agricultural products	Soil and water	Implement an Integrated Pest and Disease Management (IPM), following the manufacturer's instructions for each applied product, implementation of GAPs, etc.



Download [here](#) the Excel tool or scan the following QR code to assess the risks.

This information can be found on sheet “8. Risks” from the Excel tool.



STEP 7.

BEST PRACTICES FOR PRODUCTION PLANNING

WHY IS IT IMPORTANT TO PLAN THE PRODUCTION PROCESS?

To be successful in any business, it is necessary to **plan** each stage of the process based upon demand. Understanding the **demand** allows producers to obtain a better use of the resources available for production. For example, having adequate inventories (no more and no less quantity than necessary) in each of the production stages. Starting from sale volume references, productive resources are planned and managed in a more efficient way. Therefore, the agribusiness can be more competitive, meet delivery deadlines, satisfy the needs of its clients, and eventually consolidate the market.

Which best practices can be used to plan production?

Coffee seed and nursery should implement a series of guidelines generated from a market plan in order to carry out the best production planning practices. Suggestions for proper production practices include:

Be clear about the time being planned: short-term (less than a year) or long-term (more than a year).

Assess the production capacity that you have: factors such as the number of units to be produced, as well as the fixed and variable costs within the technical process.

Start from the demand to define the quantities to produce.

Keep track of raw materials and inventories.

Clarify the producer's objective: the profit margin they want to have, the demand they satisfy and maximizing the final quality of their products.

What advice or recommendations can be followed for the proper development of production planning?

Below are a series of tips and recommendations that coffee nursery and seed producers can implement in order to incorporate best practices into the production process:

Start producing from demand.

This helps to carry out a more efficient production process, through optimal use of resources.

Establish product specifications

This facilitates the production process based on production needs, according to the variety of coffee, type, etc.

Structure job positions.

This facilitates the assignment of responsibilities within human resources.

Identify the capacities and facilities of production.

This is used to estimate the amount of product that can be produced, based on available resources.

Identify various suppliers of raw materials and supplies.

This reduces overall risk by having several options from which producers can supply their production process.

STEP 8.

RISKS OF NOT PLANNING PRODUCTION

Planning is a **key process** for all those who have started a business, or already have one running. When planning, an environment of organization, leadership and positioning of the company is fostered. In case of seed and coffee nursery production, the production planning process, (according to the needs of the market that is satisfied) is essential for success.

By planning production and keeping track of it, great contributions are obtained, which result in efficient, effective, and economically profitable management of the resources that the company has, such as: staff productivity, raw material supply and inputs, the choice of infrastructure and the use of machinery and equipment.

WHAT HAPPENS WHEN THE PRODUCTION PROCESS IS NOT PLANNED?

When the production process is not planned, the production of seeds and coffee seedlings **may not develop in the best way** (which translates into having losses instead of profits). This is due to the fact that, within the different production stages, a series of factors that have been covered during this module have an impact, such as: production capacity, location of production, personnel skills, and technologies that are used (raw material, inputs, machinery, and infrastructure, etc). All of these elements require advance planning to achieve maximum use of the resources available to the company. The misuse of all these resources can generate economic losses for the company.

WHAT ARE THE MAIN CONSEQUENCES OF NOT PLANNING THE PRODUCTION?

Carrying out an unplanned production process generates consequences that affect the efficiency of the company, which puts the **economic and material resources** used in production at risk.

Below are a series of examples of the main consequences of not planning seed and coffee seedling production. These situational studies were compiled through research from secondary sources, as well as through interviews with producers and technicians linked to the coffee sector.

SITUATION STUDIES

Situation 1. Lost opportunities

Imagine a coffee seedling producer has a series of advance orders for the following year. However, they have not previously planned the number of financial resources that they require to carry out the production. During production they eventually realize that they do not have the necessary resources to meet the client's request in terms of quality and/or quantity. Therefore, although the client ordered 50,000 seedlings, they can only supply 30,000.

This is classified as a risk generated by not properly planning production. The producer did not fulfill the complete order on time for the delivery date, which generated a bad image, leading to the loss of opportunities in the future.

In this situation, a possible preventive measure is to use a budget to determine the number of resources needed to fulfill the order and, thus, assess whether it is possible to produce the amount of seedlings that are agreed with the customer.

Situation 2. Relationship between production and the market.

On some occasions, coffee seedling producers have productive factors in their favor, such as: access and adequate amount of substrate, technology and capital that allow them to produce a greater number of seedlings. However, two situations arise:

1. The nursery has the right factors to produce a large number of seedlings, but the market is not analyzed before planning the use of available resources and its demand is low. For example: a nursery is built with the capacity and resources to produce one million seedlings per year; however, the market only demands 200,000 seedlings per year and the resource is underutilized.
2. Production is based on the productive capacity that one has, but when it comes to selling the seedlings, only 80 % of the total amount produced is sold, which generates the risk of having to seek buyers for the other 20 % (sometimes at a lower price, otherwise the product may be lost). Some coffee nursery producers mention that the coffee seedlings, that are not sold, are used in their own production for the renewal of their coffee farms. This would be the best scenario, but if they only dedicate themselves to the production of seedlings, and do not have alternative uses for the seedlings then losses are incurred.

In these situations, a possible preventive measure is to carry out an adequate market survey (module 1). this makes the most of the productive capacity in order to help minimize risks.

COMPLEMENTARY RESOURCES

EXAMPLE OF A PRODUCTION PLAN

Below is an example of a production plan, which was prepared by Lic. Toshiaki Kurihara, Marketing Expert at JICA (Japan International Cooperation Agency), reviewed and adjusted by the PROPA-Oriente Project Team, in January of 2012

If you wish to access the production plan guide prepared by Lic. Toshiaki Kurihara, as published in Spanish, you can access the link or scan the following QR code:

https://www.jica.go.jp/project/elsalvador/0603028/pdf/production/farm_06.pdf



ANNEX.

EXAMPLE OF PRODUCTION PLAN

Annex 1. In the following table you can see an example to start a production plan.

Province / State		Surface (Ha)	
Community		Number of seedlings / seeds to produce	
Producer / Company Name		Planning day	

Activities	Sub activity	Responsible	Supplies, manpower, equipment, among others (which are necessary for production)	Cost estimate	January	February	March
Preparation for germination	Seed germination - construction of beds or terraces	Marcos	1. Materials for construction: -4 inch blocks -Wooden boards -Sacks of sawdust 2. Manpower: -Number of wages	Total cost: \$	2		
	Preparation of the substrate	Marcos	1. Materials: -M3 Sand -M3 stone -Peat -kg of compost 2. Manpower: -Number of wages	Total cost: \$	5		
	Sowing of the seed	Marcos	1. Materials: -kg Improved Seed 2. Manpower: - Number of wages	Total cost: \$	7		

Indicate the date the activity takes place.



For more information download [here](#) the tool to make the production plan or scan the following QR code:

This information can be found on sheet "9. Production Plan" from the Excel tool.



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MODULE 3

BUSSINESS MANAGEMENT



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INTRODUCTION

One of the main challenges that companies face today is increasingly business efficiency in order to maximize the use of available resources, reduce their costs, and increase their income. To achieve this, it is necessary to have instruments that allow them to achieve adequate management in all areas of the business, especially in financial and accounting matters. This way, companies can effectively evaluate and control all the resources they own, such as: assets, liabilities, income, expenses, and costs.

Proper financial management allows the company to project where it wants to go, its chances of success or failure, to propose different scenarios, and make better decisions in general.

Seed and coffee nursery production companies, like all companies, must systematically and permanently implement adequate financial management. This module covers the main elements that must be considered in order to achieve this, using tools and tips that will allow users to build the foundation of a financial culture in order to manage their business efficiently, have a good relationship with service providers, and reduce any risks associated with the business.

This module is divided into two parts: the first will address the main **planning and control instruments** (preparation of investment plans, budgets, cost structures and breakeven points), while the second part will introduce the process of **situational analysis for decision making** (cash flows, financial statements, and profitability analysis).



MODULE SUMMARY

Module 3, “Business Management”, analyzes resource management strategies for coffee seed producers, coffee seedlings producers, and in of the coffee sector.

The first part of the module: “Steps and tools for financial planning and control” covers three tools that are relevant for internal control and the administration of the company's economic resources:

1. Budget: These are documents that detail the resources that will be used to meet the administration's objectives; specifically, the required amount of resources and their value during a given period.
2. Cost structure and breakeven point: These calculations help organize and detail a company's costs of business. Each activity and element within production has a relative weight due to its respective cost, which affects the total cost of the units produced.
3. Investment plan: Planning is an essential element for any company since it organizes the deadlines, costs, and resources that are required for operation. An investment plan allows company's to define both internal and external sources of financing.

The second part of this module, “Step and tools for the financial situation and decision-making analysis”, analyzes and interprets three tools: those related to the internal management of resources and assets that the company owns, the analysis of a possible investment, and profitability indicators.

4. Financial statements: These statements provide information about the financial situation, financial performance, and cash flows of a company. These analyses help support the decision-making processes.
5. Cash flow: A summary of the inflows and outflows of cash during a project's useful life of the project (or the regular work of the company).
6. Profitability analysis: An analysis that allows a company to know its capacity to generate profits or the ability of the project's returns to exceed the income and resources that are invested in it.



OBJECTIVE: BUSSINESS MANAGEMENT

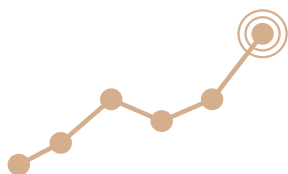
GENERAL OBJECTIVE

Present the main steps and tools necessary to achieve adequate planning, control, and situational analysis for financial decisions in coffee seed and coffee nursery production.

SPECIFIC OBJECTIVES

- 🔧 Define the necessary guidelines for carrying out an investment plan in the development of an agribusiness.
- 🔧 Develop a cost structure and breakeven analysis, for the producer to quantify the minimum level of income they need to avoid losses in their business.
- 🔧 Define a budgeting process that includes input, raw material, labor, and other requirements for successful business operations.
- 🔧 Carry out an adequate evaluation of the business through tools such as cash flows and their respective financial indicators.
- 🔧 Promote an adequate understanding of financial statements, allowing for the proper interpretation of the financial health of a company.





ELEMENTS FOR BUSINESS MANAGEMENT

PART 1. STEPS AND TOOLS FOR FINANCIAL PLANNING AND CONTROL

BUDGET

WHY MAKE A BUDGET?

A budget is a document that details the **resources** used by a company to fulfill its objectives, specifying the required number of resources and their value, over a specific period of time. Every company must make a budget to use available resources more efficiently.

It is important to clarify that budgets are based on **projections and estimates**. Therefore, the data is not exact and may be subjected to changes or updates due to unforeseen factors. For example, price drops may affect income, or increases in the costs of inputs. However, it is necessary to assess all of these possible situations in advance in order to generate contingency measures that can help reduce the impact of these risks on the business. An example of this contingency planning would be requesting several price quotes from different suppliers for a machine that has limited supply. This process help reduce the risk of exorbitant resource costs.

WHICH FACTORS ARE CONSIDERED?

The information provided by budgets make it possible to measure a **company's ability to generate income** and its liquidity (its ability to meet its financial obligations). Budgets also help determine **fixed money outlay costs** necessary for the company to maintain operations. Therefore, the information provided by budgets can be used not only by producers, but also by extension technicians, government institutions and/or financial institutions for production value estimates.

Budgets in agricultural enterprises are evaluated by **specific standardized measures**. For example, they can be evaluated per hectare or acre of land in order to calculate

the costs and income generated by each unit of land. For example, if a coffee seedling producer generates 200,000 plants on a 7,000 m² block of land, and then sells each plant at an age of 6 months for \$0.25, the producer will obtain \$50,000 (200,000 units x \$0.25) in total income for per block of land. Similarly, the production costs can also be calculated per land unit.

CONCEPTS TO CONSIDER BEFORE CREATING A BUDGET

Before preparing a budgets, costs such as **fixed costs and variable costs** must be considered. These cost types are explained in detail below:

Fixed Costs (FC): As the name indicates, these costs do not vary according to the productive level of the company since they are necessary costs for operation regardless of the quantity that is produced. Therefore, these costs do not vary in relation to time or quantity produced. Examples of fixed costs are administrative costs, fixed labor costs, municipal taxes, rent, basic services (water and electricity consumption), etc.

Variable costs (VC): As the name indicates, these costs are those that vary according to the production level since they depend on the volume of production. Examples of variable costs are costs for seeds or seedlings, bags or tubes, fertilizers, insecticides, fungicides, seasonal labor (for example: labor required to fill bags in coffee nurseries, or labor for the collection of coffee cherries in seed plantations), among others.

In addition to the concepts described above, it is important to clarify the meaning of **total costs**. These costs are calculated by adding the fixed and variable costs. Sometimes the following concern arises: What happens if the income received by the company is lower than the total costs? This usually happens when companies are in their startup stage, where initial investments are high. To answer this question, two scenarios are posed:

- 1) Profits are lower than total costs (FC + VC) but are higher than fixed costs.
- 2) Total revenue is less than total costs over a short period.

Under the first scenario, the company still maintains financial solvency. Therefore, decisions can be made to evaluate the possibility of lowering variable costs. On the other hand, if the second scenario occurs, it is advisable to continue with the normal production cycle, as long as the income exceeds the fixed costs.

HOW TO CREATE A BUDGET?

Step 1. Define the reference unit to perform the budget calculation (Example: budget per hectare, productive lot, etc.).

Step 2. Make an estimate of the income that you can obtain from production for the evaluated period (Example: income per year, per production cycle, etc.).

Step 3. Define the variable costs and the fixed costs for production over the evaluated period. Example: Variable costs per year, such as the number of bags that need to be filled during the year. Fixed costs per year, such as expenditures on rent and basic services (such as the water used for irrigation).

Step 4. Define the returns (benefits or profit) that can be generated from production. Some indicators are used in this calculation such as: **gross margin** or return on variable costs (obtained by subtracting income minus variable costs) and **net returns** (obtained by subtracting income minus total costs).

Example: A coffee nursery producer estimates a total income of \$11,000, total of variable costs of \$4,484.98, and total fixed costs of \$3,000 for the current period. The producer wants to know the gross margin, or return on variable costs, and the net return. The following formula provides this result:

$$\text{Gross Margin} = \text{Income} - \text{Total Variable Costs}$$

$$\text{Gross Margin} = \$11,000 - \$4,484.98$$

$$\text{Gross Margin} = \$6,515.02$$

$$\text{Net returns} = \text{Income} - \text{Total Costs}$$

$$\text{Net returns} = \$11,000 - \$7,484.98$$

$$\text{Net returns} = \$3,515.02$$

In this case, we see that the producer, after deducting Total Variable Costs, has a profit of \$6,515.02. However, to have a broader overview, it is necessary to include net returns, which in this case means that the producer will have a final profit of \$3,515.02 after budgeting in Total Costs.

Below is an example budget matrix for coffee nurseries, according to the steps previously mentioned.

Example applied for coffee nurseries

In the following matrix, we start from the assumption that a nursery wishes to produce 44,000 plants of the Catuai coffee variety. This nursery is just starting in the coffee nursery production business, which is why they need to create a budget in order to analyze which resources they require.

Table 12. Example of a matrix with a budget prepared for starting a coffee nursery.

Description	Reference
Area (m ²)	1,500
Duration of the productive cycle	6 months
Estimated production (plants)	44,000
Selling price	\$0.25

Activity	Description	Unit	Quantity	Unit price	Total
Income	Sale of seedlings	Unit	44,000	\$0.25	\$11,000.00
<i>Total income</i>					\$11,000.00
Variable costs					
Supplies					
Construction and maintenance of 10 seedbeds	4 inch blocks	Unit	250.00	\$0.36	\$90.00
	Sawdust	Bag	100.00	\$0.20	\$20.00
	Improved seed	kg	18.00	\$0.36	\$6.48
	Systemic fungicide	kg	5.00	\$24.31	\$121.55
Greenhouse construction	2.5m poles	Unit	200.00	\$1.01	\$202.00
	Barbed wire	Roll	5.00	\$36.47	\$182.35
	Seedlings	kg	9.00	\$1.62	\$14.58
Preparing the substrate mix for transplanting seedlings	Substrate mix	m3	90.00	\$6.08	\$547.20
	Fertilizer (18-46-0)	kg	99.00	\$0.53	\$52.47
Bag filling	Bags	Packages(thousands)	40.00	\$3.44	\$137.60
Seedling transplantation	Seedlings	Unit	40,000.00	\$0.01	\$400.00
4 fertilizations	Fertilizer (18-46-0)	kg	540.00	\$0.53	\$286.20
	Rooting	kg	10.00	\$4.86	\$48.60
3 foliar applications + fungicide	Foliar feeding	Liters	10.00	\$4.86	\$48.60
	Fungicide	Liters	2.50	\$51.86	\$129.65
<i>Total inputs</i>					\$2,287.28
Manpower					
Construction and maintenance of 10 seedbeds	Manpower	Wage	20	\$5.67	\$113.40
Construction of 10 ramadas of 10m x 12 m (120 m2 each)	Manpower	Wage	40	\$5.67	\$226.80
Preparation of substrate for bag fill-ing	Manpower	Wage	40	\$5.67	\$226.80
Bag filling	Manpower	Contract (cost per bag)	44,000	\$0.01	\$440.00
Bag lining	Manpower	Wage	40	\$5.67	\$226.80

Activity	Description	Unit	Quantity	Unit price	Total
Seedling transplanting	Manpower	Wage	40	\$5.67	\$226.80
4 fertilizations	Manpower	Wage	80	\$5.67	\$453.60
3 foliar applications + fungicide	Manpower	Wage	10	\$5.67	\$56.70
4 x weed control	Manpower	Wage	40	\$5.67	\$226.80
<i>Total labor cost</i>					\$2,197.70
<i>Total Variable Costs</i>					\$4,484.98
Fixed Cost					
Fixed labor	Administrator	Monthly salary	6	\$500.00	\$3,000.00
<i>Total Fixed costs</i>					\$3,000.00
<i>Total Costs</i>					\$7,484.98
Returns					
				Gross margin	\$6,515.02
				Net returns	\$3,515.02

This example was prepared based on the guide developed by the IHCAFE (2011).



Download [here](#) the Excel tool or scan the following QR code to prepare your company's budget.

This information can be found on sheet "1. Budget " from the Excel tool.



BEST PRACTICES WHEN MAKING A BUDGET

WHICH BEST PRACTICES CAN BE RECOMMENDED WHEN MAKING A BUDGET?

Included below are budget recommendations for seed producers and coffee nurseries, as well as technicians involved in the coffee growing sector:

Identify income

Understand the money available to be spent

Collect information on expenses

To collect this information, you must have a record of the expenses incurred. In addition, you must save invoices, tickets, account statements, etc.

Organize expenses into categories

With this, it is easier for companies to know how money will be spent in order to create a better expense structure.

Get multiple quotes

Having several quotes for different products or supplies helps to reduce the risk of having a single supplier of raw materials and/or supplies.

Figure 17. Best practices when making a budget.



COST STRUCTURE AND BREAK-EVEN POINT

WHAT IS A COST STRUCTURE?

A cost structure **organizes and details the costs of the company**, where each activity and element of production has a relative weight due to its respective cost, affecting the total cost of the units produced.

The breakeven point can be calculated through the cost structure, which provides an amount for the minimum quantity that needs to be produced (or the minimum sales volume) in order to avoid incurring losses, without necessarily obtaining profits.

WHAT TYPES OF COSTS EXIST?

Costs can be classified into several categories, the first category is fixed **costs and variable costs**, which were previously defined in the budget section (p.66). However, it is necessary to understand additional concepts in order to make an adequate cost structure. These concepts are direct, indirect, and unit costs. They are defined below:

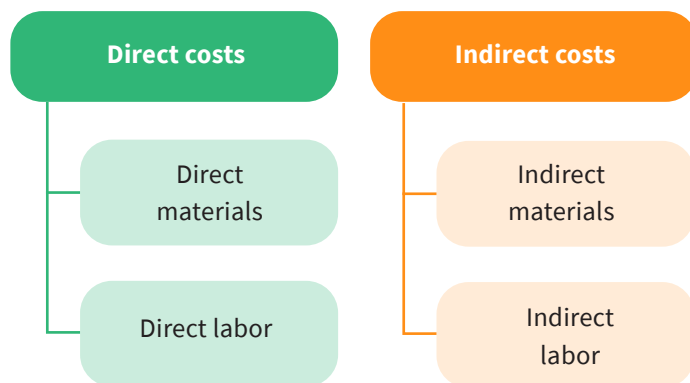


Figure 18. Summary of direct and indirect costs.

Direct costs: Direct costs are those that have a direct relationship with the product or service that is offered. Within direct costs, there are two categories:

- Direct materials:** The costs of inputs, that are used to make the final product. For example: the seed, bags or tubes, the cost of the materials used to make the substrate, etc.

- Direct labor costs:** Refers to all manpower that is in direct contact with the product that is manufactured. For example, the labor that is used for filling bags and transplanting the seedlings during the production of coffee nurseries.

Indirect Costs or Indirect Manufacturing Costs (IMC):

Indirect costs are those that do not have a direct relationship with the product being offered, including:

- Indirect materials:** Defined as all material used in production that is not classified as raw material. For example: maintenance of production equipment or a property lease.
- Indirect labor:** it includes all personnel who are not linked to production tasks. For example: administrators, managers, maintenance managers, among others. Indirect costs also include the depreciation of infrastructure, machinery, and equipment.

The third relevant concept is the **Unit Cost**, which refers to the cost of producing each unit of product. For example: how much does it cost to produce a **kilogram of coffee seed** or how much does it cost to produce a **coffee seedling**. To know the amount of how much it costs to produce each unit of product, the total costs **are divided** by the volume of production or number of units produced.

WHY IS A COST STRUCTURE IMPORTANT?

It is necessary for a company to know the costs that it is incurring, since by controlling them and, ideally, by reducing them (without affecting productivity), it can increase its profit margin from the sale of the product. In addition, understanding costs help companies analyze the different categories that are part of this structure in order to make decisions that improve their performance and make them more efficient.

HOW IS A COST STRUCTURE MADE?

Step 1. Set the unit of measurement on which you are going to work (example: hectare, acre, square meters).

Step 2. Determine Fixed Costs, Variable Costs, and Indirect Manufacturing Costs (IMC).

Step 3. Combine the costs previously mentioned.

Below is a sample matrix to make a cost structure for coffee nurseries, according to the steps mentioned above.

Example applied to the production of coffee nurseries.

In the following matrix, there is an example of a cost structure about the production of 44,000 coffee plants, in an area of 1,500 square meters and with a production cycle of 6 months

Table 13. Example of a matrix with a cost structure developed for the production in coffee nurseries.

Activity	Description	Unit	Quantity	Unit price	Total
Variable costs					
Supplies					
Construction and maintenance of 10 seedbeds	4 inch blocks	Unit	250	\$0.36	\$90.00
	Sawdust	Bag	100	\$0.20	\$20.00
	Improved seed	kg	40	\$0.16	\$6.40
	Systemic fungicide	kg	5	\$24.31	\$121.55
Ramada construction	2.5m poles	Unit	200	\$1.01	\$202.00
	Barbed wire	Roll	5	\$36.47	\$182.35
	Seedlings	kg	20	\$0.73	\$14.60
Preparation of substrate for bag filling	Substrate mix	m3	90	\$6.08	\$547.20
	Fertilizer (18-46-0)	kg	220	\$0.24	\$52.80
Bag filling	Bags	Package (thousand)	40	\$3.44	\$137.60
Seedling transplanting	Seedlings	Unit	40,000	\$0.01	\$400.00
4 fertilizations	Fertilizer (18-46-0)	kg	1,200	\$0.24	\$288.00
3 foliar applications + fungicide	Rooting	kg	10	\$4.86	\$48.60
	Foliar feeding	Liters	10	\$4.86	\$48.60
	Fungicide	Liters	2.50	\$51.86	\$129.65
Total inputs					\$2,289.35
Labor					
Construction and maintenance of 10 seedbeds	Labor	Wage	20	\$5.67	\$113.40
Construction of 10 ramadas of 10m x 12 m (120 m2 each)	Labor	Wage	40	\$5.67	\$226.80
Preparation of substrate for bag filling	Labor	Wage	40	\$5.67	\$226.80
Bag filling	Labor	Contract (cost per bag)	44,000	\$0.01	\$440.00
Bag lining	Labor	Wage	40	\$5.67	\$226.80
Seedling transplant	Labor	Wage	40	\$5.67	\$226.80

Activity	Description	Unit	Quantity	Price per Unit	Total
4 fertilizations	Labor	Wage	80.00	\$5.67	\$453.60
3 foliar applications + fungicide	Labor	Wage	10.00	\$5.67	\$56.70
4 x weed control	Labor	Wage	40.00	\$5.67	\$226.80
<i>Total labor cost</i>					\$2,197.70
<i>Total Variable Costs</i>					\$4,487.05
Fixed Cost					
Fixed labor	Administrator	Salaries	6	\$500.00	\$3,000.00
<i>Total Fixed costs</i>					\$3,000.00
Indirect Manufacturing Costs (IMC)	Equipment depreciation	Unit	1,00	\$19.91	\$19.91
	Maintenance of machinery and equipment	Construction site	5	\$8.20	\$41.00
<i>Total de IMC</i>					\$60.91
<i>Total Costs</i>					\$7,547.96

This example was prepared based on the guide developed by IHCAFE (2011).

As demonstrated in the above matrix, the cost structure presents a similar format to the budget. However, there are clear differences. First, the cost structures do not include income data. Second, the Indirect Manufacturing Costs (IMC) is not included in the budget.

CALCULATION OF THE BREAKEVEN POINT

The Breakeven Point is an **indicator** that determines the point at which company revenue covers the fixed and variable costs, (i.e. the minimum price at which the product must be sold for there to be no losses, but also no profits).

The breakeven point calculation is important for any company since it allows the company to **evaluate its profitability** by estimating the minimum number of units that need to be sold in order to cover costs.

There are generally two ways to calculate the breakeven point. The first is based on the **Breakeven Point in Volume**, through which the number of units that need to be produced to cover costs is established.

To determine the Breakeven point use the following formula:

$$BEP = \frac{\text{Fixed Costs}}{\text{Unit Price} - \text{Unit Variable Cost}}$$

The second formula is based on the **Breakeven Point in Value**. This determine the total income/sales that must be generated in order to cover costs. The following formula is used to calculate Breakeven Point in Value:

$$BEP = \frac{\text{Fixed Costs}}{1 - \frac{\text{Variable Costs}}{\text{Total Sales}}}$$

Financial expenses are derived through financing. The most common example is the interest paid on a debt.

To calculate the breakeven point, follow these steps:

Step 1. Define all costs, including administration-sales expenses, excluding financial expenses and taxes.

Step 2. Classify Variable Costs and Fixed Costs. Separate them into: Labor, Input and Materials, and Indirect Manufacturing Costs.

Step 3. Find the unit value per productive unit, which is obtained by dividing the Total Costs by the number of units produced.

Step 4. Define a possible sale price to assess the breakeven point.

Example calculation of the Breakeven Point in Volume

Shown below is the calculation of the breakeven point in volume, according to the cost structure example presented for coffee seedling production:

Steps 1 & 2. Below is a summary of the main items based on the example shown in the cost structure:

Cost Type	Cost
Fixed Costs + IMC Fixed	\$3,019.91
Variable Costs + Variable IMC	\$4,525.98
Total cost	\$7,545.89

Step 3. Next, the calculation of the Unit Cost (UC) is shown, which refers to the total cost to produce a coffee plant.

$$UC = \frac{\text{Total Cost}}{\text{Units Produced}}$$

$$UC = \frac{\$7,547.96}{44,000} = \$0.17$$

Step 4. In this case, it is assumed that the producer wants to sell their coffee plants at \$0.25. This helps to determine the profitability obtained on that sale price per plant.

$$BEP = \frac{\text{Fixed Costs}}{\text{Unit Price} - \text{Unit Variable Cost}}$$

$$BEP = \frac{\$3,019.91}{\$0.25 - \$0.10} = 20,588$$

In conclusion, it can be observed that the breakeven point is found at 20,588 plants. This indicates that for the producer to not have any losses or gains, the minimum volume of plants sold, with that specific price, must be kept at a minimum. However, in this scenario, the producer is profitable since they manage to sell 44,000 units per production cycle. This creates a safe environment for production that is above the breakeven point. Each unit sold over 20,000 plants can be considered a profit

Example: Breakeven Point in Value

To calculate the Breakeven Point in Value, the same dynamics used to calculate the Breakeven Point in Volume can be followed. However, before applying the formula, it is necessary to quantify the income that the producer will have, which is shown below.

$$\text{Total income} = \text{Sales Price} \times \text{Amount of product for sale}$$

$$\text{Total income} = \$0.25 \times 44,000 = \$11,000$$

At the end of the cycle, the nursery manages to obtain \$11,000 in profits.

Once the income is estimated, the Breakeven Point in Value is calculated, which is shown below:

$$BEP = \frac{\text{Fixed Costs}}{1 - \frac{\text{Variable Costs}}{\text{Total Sales}}}$$

$$BEP = \frac{\$3,019.91}{1 - \frac{\$4,525.98}{\$11,000}} = \$5,131.13$$

In this case, the company will need a minimum income of \$5,131.13 to maintain its obligations. By having an income of \$11,000, the company is profitable since the total income amount is higher than its Breakeven Point.



Download [here](#) the Excel tool or scan the following QR code to work out your company's cost structure and breakeven point.

This information can be found on sheet "2. Cost Structure and BEP" of the Excel tool.



BEST PRACTICES FOR CREATING A COST STRUCTURE

Which best practices can be recommended when making a cost structure?!

it is recommended for seed producers and coffee nurseries, as well as technicians linked to the coffee growing sector, to correctly carry out the elaboration of a cost structure using the following best practices:

Carrying out a cost structure **reduces the risk** of incurring expenses that are not being accounted for, and therefore, are not controlled.

Before starting the process of building a cost structure, make a **proper estimate of all costs**. Previous prepared reports can be used to create this cost structure.

It is always advisable to add an additional cost for **contingencies**, this cost is established by assigning a specific percentage of the total costs (usually 5%).

Define a **cost policy** within the company that meets the objectives set for it.

Involve operational personnel in the elaboration of the cost structure, since they are the ones with the most knowledge in the technical process.

If possible, **train the finance team** in cost systems.

Budgeting before cost structure helps in the process of setting costs.

It is important to standardize the **currency and units** used to account for costs.

Figure 19. Best practices for creating a cost structure.

INVESTMENT PLANS

WHY IS IT IMPORTANT TO MAKE AN INVESTMENT PLAN?

Planning is an essential element in any company, since it **organizes and details the deadlines, costs and resources** that are required to be able to operate. An investment plan allows a company to define the sources of both internal and external financing that can be accessed, reduce risks (such as the lack of resources needed to cover the operating costs of the business), define the inputs that will be required and their respective distribution, reduce non-essential expenses, and measure the expected profitability of the business.

With an investment plan, new projects can be created, and previous projects can be re-evaluated in order to optimize the project.

HOW DO I IMPLEMENT AN INVESTMENT PLAN?

To execute an investment plan, it is necessary for **companies to commit to continuity**. Implementation of the investment plan will depend on the level of commitment and responsibility of the administrators and collaborators.

To apply an investment plan, **internal factors** such as the financial capacity of the company, the technology with which to work, and the volume of production must be considered, in addition to **external factors** such as financing options. Furthermore, it is necessary to reflect on the investment needs and the project's expense, the most favorable options, and the optimal moment to implement the investment plan.

HOW IS AN INVESTMENT PLAN DEVELOPED?

To carry out an efficient investment plan, the following steps must be fulfilled:



Figure 20. Process to carry out an investment plan.

STEP 1. DEFINE THE OBJECTIVE

To define the objective, basic questions must be answered, such as: Why are we going to invest? Does the company have the power to carry out the project? What type of investment should be made? Is a new project going to be developed, or are we going to optimize an already established one? With the answers to these questions, certain aspects of investment can be defined. For example, if there is a real need to invest, or if the investment is not a priority and it is not functional for the company. In addition, from the previous questions, the objective of the investment plan can be generated, and it is therefore possible to develop the following stages.

Example: A coffee nursery wants to increase its productive area in order to be able to offer more seedlings in the market.

1. **Why are we going to invest?:** After having done a market survey (module 1), it is concluded that there is an unsatisfied demand, and that the opportunity can be taken to produce more coffee seedlings to supply coffee growers.
2. **Which resources are available to carry out the project?:** There is the necessary land to carry out an expansion of the nursery, in addition to the necessary equipment and personnel.
3. **What type of investment should be made?** In this case, investments could be made, such as: machinery, equipment, or infrastructure. Moreover, it would be possible to invest in working capital for the purchase of inputs, production materials, maintenance of the crop, etc.
4. **Is a new project going to be developed or are we going to optimize one already established?**

In this case, the previously existing project will be expanded.

Once the questions have been analyzed, the following objective can be reached:

Objective of the investment plan: Define the necessary investments to be able to execute the expansion of the nursery in order to produce more coffee seedlings over the following year to satisfy the unmet demand detected.

STEP 2. ANALYZE RESOURCES

The next step is to analyze the resources that the company has in order to establish the available inputs or assets (in case of an existing project) and in which regions an investment is necessary. There are two types of investments: initial and operational.

Investments within an agribusiness are necessary before the project begins to generate income, this is called an

initial investment. The initial investment in an agribusiness or company is made up of three large categories. The first category includes the assets necessary for the company to operate. The second category includes the intangible resources or pre-operational costs. The third category includes the initial operating costs, which are shown in the following figure:



Figure 21. Characterization of the resources or assets listed as part of the initial investment.

1. Assets: Within the assets that are part of the investments, a key concept must be considered, **depreciation**. Depreciation is defined as: “The decrease or loss of value of an asset over time.” This amount must be quantified.

It is important to consider the concept of depreciation, since it refers to **the useful life of the asset**, starting from the moment when the asset will contribute to the generation of income. The tax law of each country defines the number of years for depreciating an asset, according to its nature, although, it generally ranges from 5 to 10 years (for assets such as machinery, vehicles, and equipment), which is why it is relevant to evaluate for **reinvestments** over time.

Among the examples that are mentioned as part of the assets, it should be noted that **the only one that does not depreciate** is the land because it is considered an infinite resource. However, there are some exceptions, like lands that are used for mineral extraction or that are contaminated with dangerous or radioactive substances.

2. Pre-operational costs: These are categorized as part of the initial investment, since they are outflows of money that the company will have before starting its activities, and that are necessary for the agribusiness to start its operations.

3. Operating costs: Costs that are required for the business to operate during its productive cycle. For example: investments in supplies, materials, labor, etc. These investments are also known as **working capital**, and must be calculated for the entire duration of the investment project. To calculate these investments, you can use the budget tool that is detailed in this module.

TOOL TO DEFINE INITIAL INVESTMENT

Below is a matrix and its steps to define the initial investment:

Step 1. Before making an investment, it is necessary for the coffee nursery and nursery producers to define the following aspects in advance

- 🔧 Make a list of the fixed assets necessary for operation during the production process

Fixed assets are all those goods that companies have and that are necessary for their operation, but that cannot be converted into money in the short term. Some examples of fixed assets are land, machinery, equipment, vehicles, etc.

- 🔧 Make a brief description of the materials, dimensions, and capacities of the fixed assets previously listed.
- 🔧 Define the amount of additional assets needed to be purchased.
- 🔧 Make different reliable quotes or assessments in order to determine the value of the aforementioned assets.
- 🔧 Investigate how many years of depreciation the national law allows for each of the assets.

Step 2. Once you have the necessary information, proceed with filling in the following matrices.

Table 14. Matrix to plan investments in assets, required by the investment project of the company.

Investment in assets	Description (materials, dimensions, capacity)	Quantity (Q)	Unit value (UV)	Total value (Q*UV)	Years of depreciation
Land					This does not depreciate
Facilities / Buildings					
Machinery					
Production team					
Tools					
Furniture					
Others					

Table 15. Matrix to plan the pre-operational costs required by the investment project.

Pre-operational costs	Quantity (Q)	Unit value (UV)	Total value (Q*UV)
Legal procedures			
Patents			
Consulting			
Market, technical, or environmental studies, among others.			
Other pre-operating costs			

Table 16. Matrix to plan the operating costs required by the investment project.

Operating costs	Total cost
Supplies	
Workforce	
Fixed costs	

Note: To detail the table on operating costs required by the investment project, the information contained in the budget tool can be used. Therefore, in table 16, only the total amounts of these items will be included.

Table 17. Matrix to determine the total investments required to develop a project

Project investments	Value
Total amount of investments	
Total amount in pre-operating costs	
Total amount in operating costs	
Total amount	

Applied example:

Below is an applied example of the investment planning, both initial and operational, that a coffee seedling producer must make in order to produce 50,000 nursery plants. In this case, it is assumed that the producer already owns the land, that they only need to invest in assets such as infrastructure, production equipment, tools and working capital (operating costs), and that no prior pre-operating costs are incurred. It should be noted that this example does not apply at a general level since the investments will vary depending on the technological level of the nursery and the number of plants to be produced

Table 18. Example of a possible initial investment for a coffee nursery project, according to the matrices shown in tables 14,16 and 17.

Investment in assets	Description (materials, dimensions, capacity)	Quantity (Q)	Unit value (UV)	Total val-ue (Q*UV)	Years of depreciation
Land					This does not depreciate
Seedbed construction	Structure made only with 6-inch blocks. In total, there are 3 seedbeds, 12 me-ters long, by 1 meter wide.	1	\$384.15	\$384.15	5
Roof construction	1,500 m ² Greenhouse made with: 2.5-meter posts, barbed wire, and staples	1	\$1,138.80	\$1,138.80	2
Back pumps	Capacity: 20 liters.	2	\$90	\$180	5
Machetes	-	3	\$6	\$12	5
Hoe	-	3	\$8	\$16	5
Shovels	-	2	\$7	\$14	5
Pick (pickaxe)	-	2	\$11	\$22	5
Hand truck	-	2	\$61	\$122	5

Operating costs	Total cost
Supplies	\$2,289.35
Workforce	\$2,197.70
Fixed costs	\$3,000.00

Investments	Value
Total amount of investments	\$1,888.96
Total amount in pre-operating costs	-
Total amount in operating costs	\$ 7,487.05
Total amount	\$ 9,376.01



Download [here](#) the Excel tool or scan the following QR code to create your company's investment plan.

This information can be found on sheet "3. Investment Plan" from the Excel tool.

POINT 3. ESTABLISH THE STRATEGY

The establishment of the strategy includes the **definition** of the terms, the source of financing and how the investment plan will be executed.

Step 3. Once you calculate the total investment, it is necessary to define the source where the economic resources will come from in order to carry out the process;

Among many options for financing, there are: personal capital, external financing, and donations (as detailed in module 2).

The following matrix must be completed in order to assess the financing strategy that the company is going to take. Detail the following information for each item:

Table 19. Matrix to determine funding sources.

Assets / Costs	Funding Source	Total financing	Terms

Assets / Costs: In this column, the acquired asset is included

Funding Source: In this column, the source of economic resources are defined (personal capital, external financing, or donation)

Total financing: The total amount of investment is included in this column.

Terms: This column is used when the resources come from an external source, and it includes aspects such as: interest rate and financing term.

Applied example:

Continuing with the example that was shown in the previous matrices regarding the investment needed in the case of a nursery that will produce 50,000 plants, the assets, and costs in which it is intended to invest will have various sources of financing are shown in the following example.

Table 20. Example of a selection of funding sources for a coffee nursery project.

Assets / Costs	Funding Source	Total financing	Terms
Infrastructures (seedbeds and roofs / greenhouses)	External financing	\$1,522.95 (real amount) \$122 (amount from interest) \$1,644.95 (real amount)	Term: 1 year Annual interest rate: 8%
Production equipment and tools	Private capital	\$366.01	-



Recommendation

When a coffee nursery or seed producer decides to seek support through external financing, it is necessary to evaluate different alternatives, until reaching the one that offers the best conditions.

For the coffee sector, due to its relevance in the economy of the Latin American region, there are usually special programs within each of the countries, oriented to the sector and promoted by coffee unions and institutes.

POINT 4. EXECUTION OF THE PLANNED INVESTMENT

Once the resources required in the investment plan are in place, the plan is implemented with support of a cash flow to ensure that the necessary resources will be available at the right time. Cash flow is a tool that allows to quantify the economic resources that the company requires month by month, or year after year; therefore, the producer is clear about the economic needs required to operate. In addition, it is possible to evaluate the economic resources that are owned (personal capital) and the resources from external sources. This is a relevant aspect for the producer not to go into debt more than needed, and not to incur in paying interest for resources that are not being used. On the other hand, an investment plan is not only necessary to have an internal control of resources, but also to access credit, since it is usually part of the requirements requested by financial institutions.

POINT 5. FOLLOW UP

This is the last stage of the investment plan process. In it, the company must periodically analyze the investment using the cash flow tool of the project, evaluating the

possible unforeseen events, and if it is necessary to make changes to not lose sight of the objective defined for the investment plan.

Furthermore, it is necessary to update the investment plan with the market information (module 1), because if the market is generating opportunities to place more product (an unsatisfied demand), it is likely that some investments will be required to increase the technological level, to acquire more labor, or to buy more inputs to satisfy the demand of a certain number of plants or seeds. In this way, a higher income will be obtained for it to be used to pay a debt or generate more profits.

GOOD PRACTICES THAT ARE RECOMMENDED TO EXECUTE AN INVESTMENT PLAN

Which good practices can be recommended to execute an investment plan?

For seed producers and coffee nurseries, as well as technicians linked to the coffee growing sector, to correctly execute an investment plan, it is recommended to implement the following:

Carry out an analysis of your current financial situation (assess the resources you have to invest).

Research about the assets and pre-operating costs that are necessary within the investment plan.

Make several quotes to have different options to invest and choose the one that best suits the needs of the company.

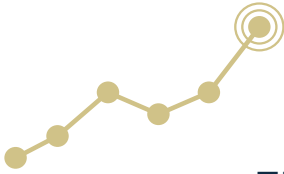
Establish the investment term (short, medium, or long term), which is linked to the objective.

Pay attention to your money movements.

Maintain constant control and frequently evaluate the results obtained.

Seek out a qualified financial advisor to optimize your finances.

Figure 22. Best practices that are recommended when making an investment plan.



ELEMENTS FOR BUSINESS MANAGEMENT

PART 2. STEPS AND TOOLS FOR ANALYSING THE FINANCIAL SITUATION AND DECISION-MAKING

FINANCIAL STATEMENTS

WHAT ARE THE FINANCIAL STATEMENTS?

Financial statements are **a structured representation of the financial position of the company**. Their objective is to provide information about financial performance and cash flows of the company in addition to supporting the decision-making processes. Among the most common financial statements are the Statement of Financial Position or Balance Sheet and the Statement of Income, which are detailed below:

1. STATEMENT OF FINANCIAL POSITION OR BALANCE SHEET

Although there are several financial statements, this module covers only the most common ones. The first financial statement is the **Statement of Financial Position**, also known as the **Balance Sheet**. This shows the economic situation of the company over a given period of time. It is made up of three elements: assets, liabilities, and equity.

Which are the elements of the Statement of Financial Position?

The first element is the **assets**, which are defined as a resource controlled by the entity and, from which, the company expects to obtain future benefits. For example: a vehicle, a building, machinery, a piece of land or. On the other hand, there are the **liabilities**, which are the present obligations that the entity has, i.e., what the company owes to other people or entities. These obligations can be short-term, (with a expiration period of less than 12 months) or long-term (with an expiration period greater than 12 months). The final element of is the **Equity or Capital**, which is the financial contribution provided by the owners or investors.

When creating a Statement of Financial Position it is critical to complete **the accounting formula** to avoid possible errors. The accounting formula is shown below:



Figure 23. Detail of the accounting formula, used to prepare the Statement of Financial Position

With this, we can see that the total assets must be equal to the sum of liabilities plus equity. What this means is that with internal financing (equity) and external financing (liabilities), it should be possible to cover the assets of the company. This help companies determine whether they can continue to operate using their current assets on-hand.



Example of a Statement of Financial Position or Balance Sheet

Below is a didactic example of a Balance Sheet.

Commercial Enterprise Almacigos de Café S.A. Balance sheet as of December 31, expressed in dollars		
	2020	2019
Asset		
Current asset		
Cash and banks	\$14.800,00	\$29.700,00
Accounts receivable	\$9.200,00	\$11.000,00
Inventories	\$17.000,00	\$20.500,00
Investments in shares	\$6.000,00	\$15.200,00
Total current assets	\$47.000,00	\$76.400,00
Non-current Asset		
Land and buildings	\$198.000,00	\$198.000,00
Machinery and equipment	\$56.000,00	\$96.000,00
Vehicles	\$87.000,00	\$145.000,00
Total gross fixed assets	\$341.000,00	\$439.000,00
Minus: Accumulated depreciation	-\$60.000,00	-\$82.500,00
Total non-current assets	\$281.000,00	\$356.500,00
Total assets	\$328.000,00	\$432.900,00
Liabilities		
Current Liabilities		
Accounts payable suppliers	\$17.000,00	\$19.000,00
Salaries to pay	\$5.000,00	\$7.500,00
Taxes to pay	\$1.500,00	\$6.300,00
Short-term document payable	\$8.500,00	\$2.900,00
Total current liabilities	\$32.000,00	\$35.700,00
Non-current liabilities		
Long-term document payable	\$28.000,00	\$30.000,00
Mortgage payable	\$160.000,00	\$180.000,00
Total long-term liabilities	\$188.000,00	\$210.000,00
Total liabilities	\$220.000,00	\$245.700,00
Equity		
Social capital	\$41.850,00	\$107.615,50
Bookings	\$25.314,70	\$38.500,00
Capital appreciation	\$30.000,00	\$30.000,00
Profits for the period	\$10.835,30	\$11.084,50
Total equity	\$108.000,00	\$187.200,00
Total liabilities and equity	\$328.000,00	\$432.900,00

Source: Personal elaboration, taking the structure of Joseph Alberto (2019).

Figure 24. Example of a Balance Sheet.

Note: Some of the accounting items used within the Balance Sheet are defined below.

Laboral obligations: These are liabilities that refer to the payment of wages.

Social capital: These are the contributions of money, that the partners made as part of the initial equity.

The term of current liabilities and current assets is detailed in figure 27.

2. INCOME STATEMENT

The objective of the Income Statement is to reflect the **income and expenses of the company's operations** in an orderly and detailed manner. This is composed of two elements: income and expenses. The total Net Profit can be obtained by subtracting between the two elements.

Which are the elements of the Income Statement?

This statement has two elements

- 🔑 **Income:** Defined as the entry or receipt of cash from sales of products or services.
- 🔑 **Expenses:** Defined as the outflows of money that the company has used to generate income. Example: salary expenses, rental expenses, insurance expenses, etc.

The purpose of the Income Statement is to determine if the company has obtained profits or losses at the end of the period (year, production cycle, etc.), which is obtained through the following formula:



Figure 25. Base formula for the preparation of an Income Statement.

To be profitable, a company needs to earn more income than the expenses over a given period of time. If the expenses in the production are higher than total income, losses are obtained.

Example of an Income Statement

Below is a didactic example of an Income Statement.

Note: The cost of sale within an Income Statement represents the cost of the raw material, and the cost of production of the final product (in this case, the coffee plants or seedlings).

Almácigos de Café S.A. Commercial Enterprise
Comparative Income Statement from January 1 to December 31
expressed in dollars

	As of December 31	
	2020	2019
Sales revenue	\$41.500,00	\$50.000,00
Minus: Cost of sales	-\$22.631,00	-\$27.835,00
Gross profit	\$18.869,00	\$22.165,00
Minus: Operating expenses		
Selling expenses	-\$1.000,00	-\$1.500,00
General and administrative expenses	-\$1.820,00	-\$2.430,00
Depreciation expense	-\$1.500,00	-\$1.500,00
Total operating	-\$4.320,00	-\$5.430,00
Operating profit	\$14.549,00	\$16.735,00
Minus: Interest expenses	-\$930,00	-\$900,00
Profit before taxes	\$15.479,00	\$15.835,00
Minus: Taxes (30%)	-\$4.643,70	-\$4.750,50
Net profit after taxes	\$10.835,30	\$11.084,50

Source: Personal elaboration, taking the structure of Joseph Alberto (2019).

Figure 26. Example of an Income Statement (Profit and Loss Statement).

Financial statements present general information.

Therefore, companies must analyze each area to draw conclusions about their real financial situation in order to make decisions based on it. For example, if liabilities are greater than the equity in the Statement of Financial Position, it means that the main source of company financing is external. This translates into indebtedness, and can be dangerous for the company, because it is operating through loans.

Another example is, if the Income Statement shows that expenses are greater than the income, the company must cut unnecessary expenses (i.e. reducing staff salaries) and maintain essential expenses (i.e. basic services) or change the sales strategy in order to increase the income.

Generally, financial ratios are intended to be tools for the analysis of the fundamental aspects of companies, which according to Robles (2012) and Gitman & Zutter (2012) are summarized **in the following four main indicators**:

- 🔑 Liquidity or solvency indicators.
- 🔑 Indebtedness indicators.
- 🔑 Profitability indicators.
- 🔑 Activity or efficiency indicators.

Each of the mentioned indicators provide a series of financial markers that serve to evaluate the management of the company. In order to **have a complete analysis of the financial situation**, it is necessary to use several or most of the financial ratios. If only one indicator is used, then it is not possible to properly assess the situation of the company at a general and reliable level. Each of the ratios or indicators are explained below, with their respective examples.

FINANCIAL RATIOS

WHAT ARE FINANCIAL RATIOS?

The financial statements previously covered are a summary of the information usually generated by the accounting staff of a company. However, this information should not only be presented, but also be analyzed and interpreted in order to truly understand the financial health of the company for the period in which the information is generated.

Financial ratios make it possible to analyze the different items that make up the Income Statement and the Balance Sheet by comparing accounting cycles. With this, it is possible to make timely corrections, identify the management control indicators/the financial performance of the company, and make projections in the short, medium, and long term.

1. LIQUIDITY OR SOLVENCY INDICATORS.

The term liquidity refers to **a company's ability** to meet its short-term financial obligations. In other words, it is the ability of a company's assets to become money in the short term. Some examples of assets that companies can convert into cash (in the short term) are shares of publicly traded companies, bank deposits, short-term investments, inventories and accounts receivable.

To understand the liquidity ratios, it is necessary to understand the concepts defined below:

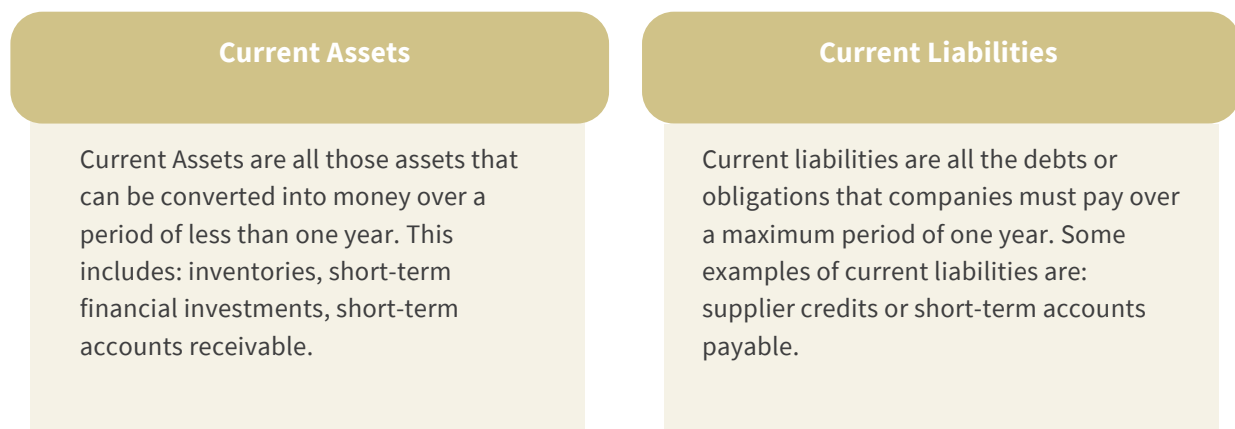


Figure 27. Defining key concepts to understand financial liquidity ratios.

The main indicators (financial ratios) used to measure solvency or liquidity within a company are explained and exemplified below:

- a. Net Working Capital:** This indicator refers to the economic resources used by the company in the short term. To obtain the amount of Net Working Capital, the following formula is used:

$$\text{Net Working Capital} = \text{Current Assets} - \text{Current Liabilities}$$

First, the company must identify all current assets (definition on page 85) and add them all together. They must also add up all current liabilities (definition on page 85) and add them as well.

Example:

$$\text{Net Working Capital} = \$47,000 - \$32,000$$

$$\text{Net Working Capital} = \$15,000$$

Interpretation: If the result of the Net Working Capital indicator is a number greater than zero, this means that the company has sufficient assets to cover its short-term debts, which is a favorable scenario. The higher the number of the result of this indicator, the better for the company. If the result of the equation is a number less than zero, it means that the assets that the company has, do not have the capacity to cover the debts it has in the short term.

Based on the previous example, if the company has some Accounts Payable in the short term (debts less than one year), their assets can cover these debts and there would also be a surplus of \$15,000.

- b. Current Index - Solvency Index - Current Ratio:** This indicator shows the ability of the company to pay Current Liabilities (definition on page 85). As in the previous indicator, all current assets and liabilities must first be identified and added together. To obtain the Solvency index, the following formula is used:

Example:

$$\text{Solvency Index} = \frac{\text{Current Asset}}{\text{Current Liability}}$$

$$\text{Solvency Index} = \frac{\$47,000}{\$32,000}$$

$$\text{Solvency Index} = 1,47$$

Interpretation: If the result of the Solvency index formula is a number greater than zero, it is a favorable scenario for the company since it means that it can pay its current liabilities. Some experts note that the optimal level of solvency is 1.5 or greater, so the higher this index is, the better for the company.

Based on the previous example, if a company has \$1.47 to pay each dollar of debt. This is the Solvency Index.

- c. Acid test:** This indicator shows the capacity or solvency the company has to pay Current Liabilities, excluding its inventories (i.e., without committing or selling the inventory that the company has). As in the previous indicator, all current assets and liabilities must first be identified and added together. The value of the inventories must also be accounted for. To obtain the solvency index, the following formula is used:

Note: The value of the inventories within the General Balance refers to the monetary value of the merchandise that is kept in the warehouse. For example, in a coffee nursery this includes bags, supplies, material to make the substrate, metal beds for tubes, etc. In the production of coffee seeds, this includes agricultural inputs, such as fertilizers, fungicides, insecticides, as well as other products.

$$\text{Acid Test} = \frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}}$$

Example:

$$\text{Acid Test} = \frac{\$47,000 - \$17,000}{\$32,000}$$

$$\text{Acid Test} = 0.94$$

Interpretation: If the result of the Acid Test, after applying the formula, is a number close to 1, then it is a favorable scenario for the company since this means that the company has the capacity to cover its current liabilities without the need to sell any inventory. Ideally, the acid test result should be greater than 1. However, if it is generally kept in a range of 0.80 to 1, then it is considered reasonable.

In the example above, the company has \$0.94 to pay each dollar of debt, without having to compromise its inventories.

Final results of the liquidity or solvency indicators

This section analyzes the capacity of the example company, Almacigos de Café S.A. Commercial Enterprise, to meet its obligations through three financial calculations, where the following results were obtained:

1. Net Working Capital = \$15,000

The entrepreneur may conclude that the company has sufficient assets to meet its short-term obligations.

2. Solvency Index = 1.47

In this case, the company has \$1.47 to pay for each dollar of debt, which is a favorable point.

3. Acid test = 0.94

This indicator reflects that the company has a good outlook, since it has \$0.94 to pay for each dollar of debt, without having to incur the sale of its inventories.

In conclusion, the liquidity indicators show positive parameters. Therefore, Almacigos S.A. has sufficient resources to meet its obligations during the 2020 period.

2. INDICATORS OF DEBT

Debt refers to the resources that people or institutions outside the company (creditors) provide to it, for it to operate and generate profits. The **debts** that a company acquires generate payment obligations over a specific period of time. Therefore, when there is a greater number of economic resources that come from third parties, there is a greater the risk for the company since they must comply with these external financial obligations.

Debt ratios help **measure the level of risk** that companies have in terms of financing from their creditors.

Financial debt ratios are important because:

- Using these ratios, it is possible to **evaluate** whether the level of indebtedness represents a risk for the company and its investors.
- These calculations make it possible to **determine** whether the company's rate of return is in line with the interest rate of the debt, thereby helping the company evaluate how convenient the financing conditions are.

The main indicators (financial ratios) used to measure indebtedness within a company are explained and exemplified below:

a. Debt ratio: This financial ratio measures the percentage of assets that are financed by creditors. All liabilities and all assets must be added first. To obtain the debt ratio, the following formula is used:

Example:

$$\text{Debt ratio} = \frac{\text{Total liabilities}}{\text{Total assets}} \times 100$$

$$\begin{aligned}\text{Debt ratio} &= \frac{\$220,000}{\$328,000} \times 100 \\ \text{Debt ratio} &= 67.07\%\end{aligned}$$

Interpretation: The result of this formula must be a percentage, so it is multiplied by 100. It is done this way since the ratio seeks to present the proportion of assets that are financed by third parties (creditors).

Using this example, the company has a level of indebtedness at 67.07%

In the previous example, the company has a level of indebtedness of 67.07%. This indicates that the assets of the company are being financed by third parties at a rate of 67.07% (creditors are entitled to this percentage of the assets owned by the company). The optimal values for this indicator will depend on the sector and the type of company. However, ideally the debt ratio should be between 40% to 60%.

b. Debt-Equity Ratio: Leverage is a financial concept that reflects a relationship between investment and debt. In other words, it is the relationship between the indebtedness that the company has and what its owners or partners contribute. To calculate this ratio, the amount of total liabilities and equity must be determined first. To obtain the debt-equity ratio, the following formula is used:

$$\text{Debt/Equity Ratio} = \frac{\text{Total liabilities}}{\text{Net Capital}}$$

Note: The net capital or net worth is the result of the assets (assets that the company has) minus the liabilities (obligations and financing that the company has) within the Balance Sheet.

Example:

$$\text{Debt/Equity Ratio} = \frac{\$220,000}{\$108,000}$$

$$\text{Debt/Equity Ratio} = 2.04$$

Interpretation: This ratio seeks to indicate the proportion or relationship between the amount of debt that a company is using to finance its assets through creditors, and the assets that are being financed by the contribution of the partners (capital). When the result is greater than 1, this means that the assets of the company are being financed mostly by third parties (creditors).

In the example above, the company's Debt/Equity Ratio is 2.04. This indicates that the financing used by the company comes, in a greater proportion, from creditors (debt).

Melchor (2016) mentions that 0.30 is a good indicator for the Debt/Equity Ratio since this means that the company has a small proportion of debt. On the other hand, when the result is greater than 1, it does not always indicate a problem since the company may be able to generate enough cash to function and maintain its level of indebtedness.

Final result on debt indicators

This section analyzes the level of indebtedness that the example company, Almacigos de Café S.A. Commercial Enterprise, has by using two financial ratios from which the following results were obtained:

1. Debt ratio = 67.07%

The entrepreneur can conclude that 67.07 % of the company's assets are being financed with external resources, which generates a risk, since creditors are entitled to that percentage of the assets owned by the company.

2. Debt / Equity Ratio = 2.04

This indicates that the company is overdrawn, since most of the resources that are being used come from external sources (financing) and not from personal capital.

In conclusion, this level of indebtedness indicators provide an unfavorable outlook for the company in the 2020 year. Management will have to make decisions for the level of indebtedness to reach favorable levels.

3. PROFITABILITY INDICATORS

Profitability ratios are used to identify the **degree of profitability** that the company has in terms of its level of sales, number of assets, and/or capital contributed by partners. The most common indicators (financial ratios) used to measure the profitability of a company are included below:

a. Gross Profit Margin: The Gross Profit Margin is an indicator that measures the percentage of profit obtained after covering the cost of production of the goods or merchandise. With this indicator, it is possible to calculate the percentage that the company has left of each dollar from sales after it has paid for its goods. The higher this indicator, the better the financial health of the company since it indicates that the relative cost of goods or stocks is lower. Before you can calculate this ratio, you need to obtain the total amount of sales and their cost. To obtain the Gross Profit Margin, the following formula is used:

$$\text{Gross Profit Margin} = \frac{\text{Sales} - \text{Cost of sales}}{\text{Sales}} \times 100$$

Example:

$$\text{Gross Profit Margin} = \frac{\$41,500 - \$22,631}{\$41,400} \times 100$$

$$\text{Gross Profit Margin} = 45.47 \%$$

Interpretation: This indicator seeks to demonstrate the profit against the costs generated by sales (cost of merchandise).

This example above indicates that the Gross Profit Margin is 45.47 %. This means that sales cover the cost of sales in that percentage. In other words, for every dollar the company receives from sales, it has \$0.4547 left (after paying its costs from sold merchandise).

b. Operating Profit Margin: The Operating Profit, or Operating Income, is an indicator that measures the percentage of profit that the company obtains, after covering its sales costs.

Please note that this indicator excludes all interest, taxes, or dividends on shares that the company may have. To obtain the Operating Profits Margin, the following formula is used:

Note: Operating Income is a value that is shown in the Income Statement. It measures the profit obtained by a company, after covering its operating expenses. This value does not include deductions for interest and taxes.

$$\text{Operating Profit Margin} = \frac{\text{Operating Profit}}{\text{Sales}} \times 100$$

Example:

$$\text{Operating Profit Margin} = \frac{\$14,549}{\$41,500} \times 100$$

$$\text{Operating Profit Margin} = 35.06\%$$

Interpretation: This indicator shows the “pure profit” (profit without interest, taxes, or preferential dividends) compared to the value of the company’s sales. In other words, it measures the pure profit generated by each dollar for sale.

The example above shows an Operating Profit Margin of 35.06 %. Therefore, the company obtains \$35.06 for every \$100 in sales. The higher this indicator, the better for the company. Alternatively, if the company has an exceptionally low Operating Profit Margin, it is recommended that the company adjust its expenses in administration and sales. If the number is negative (less than zero), it shows that the company will not be able to sustain itself financially.

The difference between the Operating Profit Margin and the Gross Profit Margin is that the former takes into consideration all operating expenses (expenses that come from administration and sales) without including interest and/or tax expenses, while the latter does not include operating expenses, only costs of sales are considered.

c. Net Profit Margin: The Net Profit Margin is an indicator that shows the percentage of profit that the company obtains, after covering all of its costs and expenses. This indicator does include aspects such as taxes, interest, and dividends for preferred shareholders. To obtain the Net Profit Margin, the following formula is used:

$$\text{Net Profit Margin} = \frac{\text{Net Income}}{\text{Sales}} \times 100$$

Note: Net Income (shown in the Income Statement) measures the profit obtained by the company after subtracting operating expenses, commissions, interest, and taxes.

Example:

$$\text{Net Profit Margin} = \frac{\$10,835.30}{\$41,500} \times 100$$

$$\text{Net Profit Margin} = 26.11\%$$

Interpretation: This indicator shows the net profit (profit that includes all expenses and costs, with interest, taxes and/or preferential dividends) compared to the value of the company's sales. In other words, it measures the net profit generated by each dollar earned in sales.

The example above shows a Net Profit Margin of 26.11 %. This means that the company obtains \$26.11 for every \$100 in sales. The higher the indicator, the more favorable it will be for the company since a high result shows the success in terms of the profits obtained from sales.

d. Return on Investment: It is also known as Return on Total Assets (RTA). This indicator determines the profit that the company makes through the management of its assets (i.e., the ability of the assets to generate profits or income). The higher the return on investment, the better for the company. To obtain the Return on Investment, the following formula is used:

$$\text{Return on Investment} = \frac{\text{Net Profit after taxes}}{\text{Total assets}} \times 100$$

Example:

$$\text{Return on Investment} = \frac{\$10,835.30}{\$328,000} \times 100$$

$$\text{Return on Investment} = 3.30\%$$

Interpretation: The example above demonstrates a Return on Investment at 3.30 %. This means the company obtains \$0.033 for every dollar in sales. This means that the investment generated in the total assets of the company has an extremely low return. The higher the result, the better the company.

Conclusion on profitability indicators

In this section, the sample company's (Almácigos de Café S.A. Commercial Enterprise) degree of profitability is analyzed through four financial ratios, from which the following results were obtained:

1. Gross Profit Margin = 45.47 %

The entrepreneur can conclude that after covering the cost of producing coffee seedlings, they have 45.47 % profit left. This indicates that for every \$100 in sales, the company receives \$45.47, after paying its costs in merchandise sold (production cost).

2. Operating Profit Margin = 35.06 %

This indicator means that the company obtains \$35.06 for every \$100 in sales, which shows a positive outlook since the company is financially stable after covering its general, administrative, sales, and depreciation expenses.

3. Net Profit Margin = 26.11 %

The Net Profit Margin helps the company determine how much profit it is obtaining after incurring all its expenses (including taxes and interest). In this case, for every \$100 in sales, the company earns \$26.11 profit.

4. Return on investment = 3.30 %

Finally, the Return on Investment indicator shows how much profit the company is earning on the investment value of its total assets. In this case \$3.30 is being generated for every \$100 that was invested in the assets. This is a very low return on investment.

In conclusion, the profitability indicators provide a favorable outlook for the company in the 2020 period. The profit margins demonstrate that the company covers its expenses and generates a positive net profit. However, when analyzing the performance on the investment, a more nuanced picture emerges showing that the company is generating little profit on the investments that they have made to operate. This is likely related to a high level of indebtedness.

4. ACTIVITY OR EFFICIENCY INDICATORS

The activity or efficiency ratios indicate the ability of certain accounts, within the Income Statement (page 84), to **generate cash** or become sales. In other words, the inflows or outflows of money within companies. Through these indicators, the efficiency at which a company operates can be measured. Among the most common reasons for calculating these ratios are the following:

- a. Inventory Rotation:** This is used to evaluate the efficiency of the company's operations since it indicates the the number of times that the inventory is sold on average. A low inventory rotation can be interpreted as something negative, since it implies that the company has many static resources in its possession. For example, this could apply to the amount of plants that remain unsold in the greenhouse of a coffee nursery. The higher the inventory rotation, the better since it reflects dynamism in sales. To obtain the Inventory Rotation, the following formula is used:

$$\text{Inventory Rotation} = \frac{\text{Sales Costs}}{\text{Inventory}}$$

Example:

$$\text{Inventory Rotation} = \frac{\$22,631}{\$17,000}$$

$$\text{Inventory Rotation} = 1.33$$

Interpretation: In the example above, the company rotates its inventories 1.33 times a year. For companies that have perishable products or biological assets, it is better to have a high inventory rotation. For companies that do not have a high inventory rotation, they run the risk that the products in inventory (plants, seeds, or other inputs) lose viability and have to be discarded.

This indicator can be complemented with the period that the company takes to sell or leave the inventory. This indicator is measured via Inventory Days Index, which is the number of days that the company takes, on average, to sell its inventories. The following formula is used:

$$\text{Inventory Days Index} = \frac{365}{1.33}$$

Example:

$$\text{Inventory Days Index} = \frac{365}{1.33}$$

$$\text{Inventory Days Index} = 274$$

Interpretation: The example above demonstrates that the company has an average inventory age of 274 days, which indicates that the company sells its inventories every 274 days. This should coincide with the usual productive cycles in the production of seed or plants in the nursery.

b. Average Collection Period: This indicator is linked to the credit that the company provides to its clients. It is a useful tool for evaluating credit and collection policies within the company. Using this metric it is possible to determine the age of the accounts receivable. The lesser it is, the better for the company. To obtain the Average Collection Period, the following formula is used:

$$\text{Average Collection Period} = \frac{\text{Accounts receivable}}{\frac{\text{Annual sales}}{365}}$$

Example:

$$\text{Average Collection Period} = \frac{\$9,200}{\frac{\$41,500}{365}}$$

$$\text{Average Collection Period} = 81 \text{ days}$$

Interpretation: This example demonstrates that the company has an Average Collection Period of 81 days. This must then be compared with the collection policies that the company has. For example, if the company has a 30-day collection policy, the previous example shows that credits are poorly managed since it takes up to 81 days to collect from customers.

c. Average Payment Period: In contrast to the previous indicator, the Average Payment Period indicates the age of accounts payable to company suppliers. To calculate this indicator, it is necessary to have data on the company's annual purchases, which is not in the financial statements. Oftentimes, a percentage of the cost of sales is used to calculate this. To obtain the Average Payment Period, the following formula is used:

Example of calculating annual purchases:

Annual purchases = cost of sales x assigned percentage

Annual purchases = \$22,631 x 80%

Annual purchases = \$18,104.80

$$\text{Average Payment Period} = \frac{\text{Accounts payable}}{\frac{\text{Annual purchases}}{365}}$$

Example:

$$\text{Average Payment Period} = \frac{\$17,000}{\frac{\$18,104.8 \text{ (80\% of sales costs)}}{365}}$$

$$\text{Average Payment Period} = 343 \text{ days}$$

Interpretation: The example above shows that the company has an Average Payment Period of 343 days. This must then be compared with the payment policies that the company has, and the type of credit that its suppliers provide. For example, if the company's suppliers demand payment for purchases within a maximum period of 30 days, the previous example indicates that the company is not doing well in terms of payments to its suppliers.

Economic literature notes that a good indicator for the company is when the Average Payment Period is greater than the Average Collection Period since this means that the company will have greater payment capacity. For example, if the company owes \$100 to a supplier, and a customer owes the company \$100, the best thing to do would be to collect those \$100 first from the customer (since with this resource the supplier can be paid).

Conclusion on the activity indicators

This section analyzes the ability of certain accounts, within the Income Statement, to generate cash or become sales. In other words, the inflows, or outflows of money for the example company (Almácigos de Café S.A. Commercial Enterprise).

1. Inventory Rotation= 1.33

Using this indicator, the entrepreneur can analyze the efficiency they have at the operational level. It is observed that inventory rotates 1.33 times a year. Even though this result is low, the nature of the business means that there is not a strong rotation of inventories because the producers of coffee seedlings sell the plants at an age of 6 to 12 months, since sales only occur at specific times of the year.

2. Average Collection Period = 81 days.

This indicator indicates that accounts receivable are made in a period of 81 days. Therefore, the employer or administrator must analyze whether this scenario complies with its credit and collection policies because if the collection must be done in a shorter period, this means that credits are being poorly managed.

3. Average Payment Period = 343 days.

Finally, the average payment period gives the entrepreneur or administrator a sense of the time it takes for the company to comply with its obligations, which, like the previous indicator, must be analyzed according to internal payment policies. In this case, it is observed that the elapsed period for the company to comply with its obligations is high (343 days). However, this scenario may be normal within the coffee seedling production business since companies generally request annual credits and cancel them in a single payment at the end of each year.



Download [here](#) the Excel tool or scan the following QR code to analyze the Financial Statements of your company using the financial ratios set out above.

This information can be found on sheet “4. Financial Statements” from the Excel tool.



Note: If you want to know more about this topic, you can visit the following links:

Book Principles of Financial Management: <https://educativopracticas.files.wordpress.com/2014/05/principios-de-administracion-financiera.pdf>



Book Fundamentals of Financial Management

<https://www.upg.mx/wp-content/uploads/2015/10/LIBRO-49-Fundamentos-de-administracion-Financiera.pdf>



BEST PRACTICES WHEN ANALYZING A COMPANY'S FINANCIAL STATEMENTS

Which best practices are recommended to properly analyze the Financial Statements of a Company?

For seed producers and coffee nurseries, as well as technicians linked to the coffee growing sector, it is recommended to implement the following best practices when carrying out an analysis of the Financial Statements:

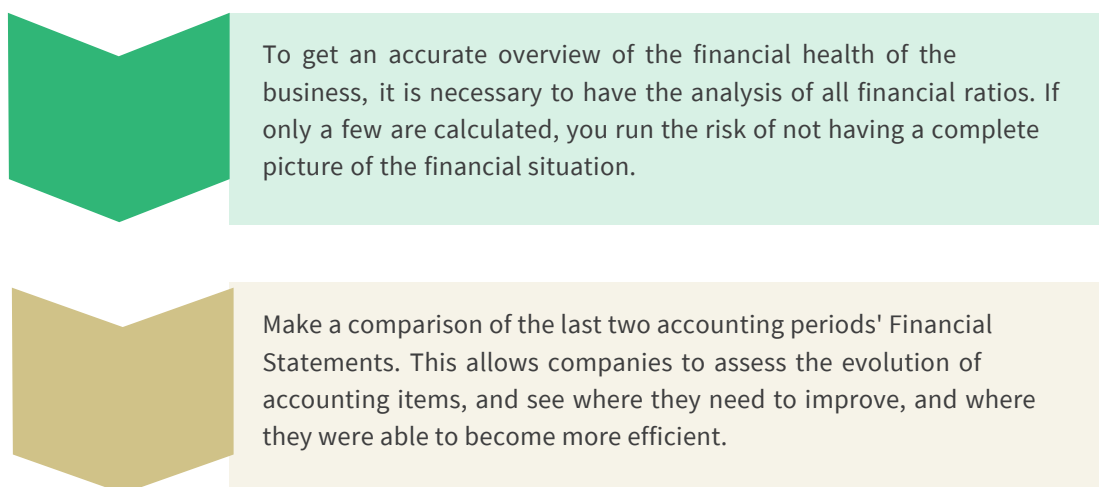


Figure 28. Best practices when analyzing the Financial Statements of Companies.

CASH FLOW

WHAT IS CASH FLOW?

The cash flow is intended to summarize the cash inflows and outflows during the months and/or years of useful life of the project, or the regular work of the company, thus supporting decision-making and control over the results.

There are three types of cash flows depending on the objective:

- 🔑 The first seeks to measure the **business' profitability**.
- 🔑 The second seeks the **investor's profitability**.
- 🔑 The third measures the **ability to pay** of the business itself (i.e., if the business can meet the payment commitments assumed due to a possible indebtedness).

WHY CREATE A CASH FLOW?

Cash flows are profitability projections. By making them, companies will be able to know in advance about possible cash shortages. Consequently, financing solutions can be foreseen in a timely manner and created to produce profits. Cash flow provides companies with a basis to make strategic decisions, and they are the best tool to manage both the permanent operations of the business and its future investments.

Note: This module will delve into measuring the profitability of the business, since cash flow is the easiest to build and analyze. If you want more information about this topic, you can read the fifth or sixth edition of "Project Preparation and Evaluation" by Nassir Sapag Chain, Reinaldo Sapag Chain, and José Manual Sapag.

HOW IS A CASH FLOW DEVELOPED?

To prepare a cash flow, it is necessary to collect and systematize the information derived from other previously prepared studies: the market survey (module 1) and the production plan (module 2). Financial information within an agribusiness is important since it identifies and organizes the income and expenditure streams that are expected to be received or paid on a monthly or annual basis. To develop a cash flow, it is important to identify the three main components:

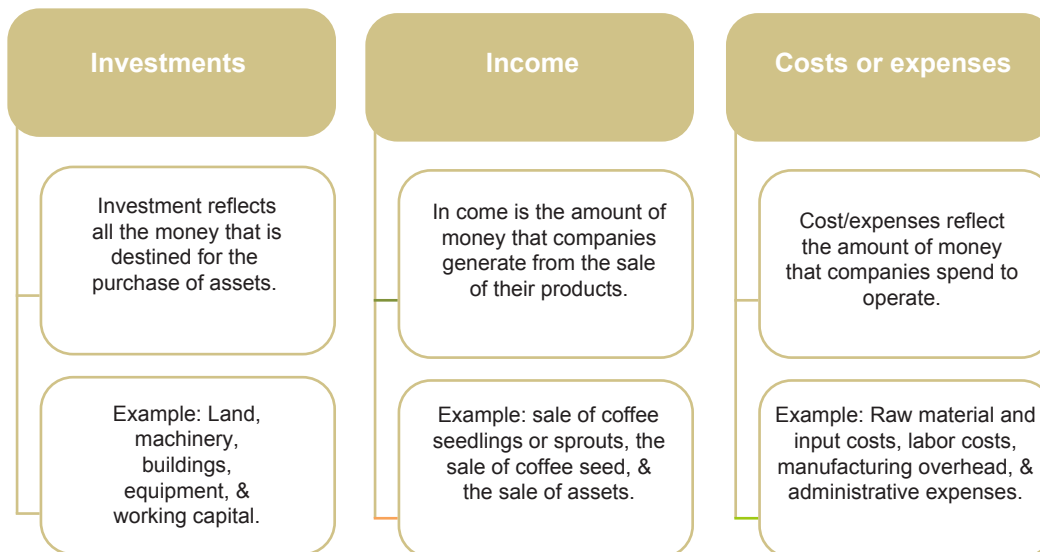


Figure 29. Main components used to develop a cash flow.

Investments

Investments are divided into two broad categories: the first is the **initial investment**, which includes all those investments that are made before starting the business process; the second are all those investments that are made during the operation of the company over the years, these are called **reinvestments**.

Generally, the investments in a project are made for the purchase of assets. A good indicator in deciding the ideal moment to carry out a **reinvestment**, is the **depreciation** of those investments.

What is depreciation and how is it calculated?

Depreciation refers to the decrease or loss of value of an asset over time. For example, if a coffee nursery producer decides to install a greenhouse, it will have an initial cost when it is installed and a different value as time passes. The value of that greenhouse will not be the same over time, and it is likely that there will come a time when the producer will have to replace this greenhouse with a new one, which means that they must make a **reinvestment**.

There are different methods to calculate the depreciation of assets; however, one of the most used is the **linear depreciation** method, which is very easy to apply and is shown in the following example.

Example of calculating linear depreciation.

Imagine that a coffee seedling producer makes an investment in a backpack pump with a capacity of 20 liters. This pump will be used to carry out applications of products such as fertilizers, insecticides, and others, according to the management plan. The initial investment for this backpack pump was \$90. However, according to the legislation of that country, this type of asset is classified as agricultural equipment with a useful life of 5 years. The producer wants to know the annual depreciation amount that would correspond to this asset, and applies the linear depreciation method through the following formula:

$$\text{Linear depreciation} = \frac{\text{Initial asset value}}{\text{Useful life}} = \frac{\$90}{5 \text{ years}} = \$18$$

In this case, the result of the annual depreciation for the backpack pump is \$18 during its useful life of 5 years, which suggests that there is an accounting loss in the value of the asset of \$18 per year. After that time, the producer may have to replace the equipment.

Income

Income is the amount of money that the company receives from the sale of its products. In the case of producers of coffee seeds and seedlings income would come from the number of seeds and the amount of coffee plants that are sold in the year.

The income projection is linked to market demand (Module 1). In addition, it is necessary to establish the sale price of the products that are offered, which is defined in the first part of this module through the cost structure (page 71) and the breakeven point (page 75).

Costs

Costs (expenses) are defined as the amount of money that companies spend to operate. These can be anticipated by estimating the manpower requirement, raw material and input requirements, and other costs that are seen in module 2. The costs depend on the technological level and the purchasing power of the company.

Basic structure of a cash flow

Once the previously mentioned components are defined, the cash flow is chart is created. The basic structure that serves as a guide is shown below:

Figure 30. Basic structure for a cash flowchart.

Year 0	Year 1	Year n
-Investments	+ Income	+ Income
	-Fixed costs	- Fixed costs
	-Variable costs	- Variable costs
	= Operating profit	= Operating profit
	- Depreciation	- Depreciation
	= Profit before Tax	= Profit before Tax
	-Taxes	- Taxes
	= Net profit	= Net profit
	+ Depreciation	+ Depreciation
	= Net cash flow	= Net cash flow
	= Accumulated cash flow	= Accumulated cash flow

Note: Cash Flows are generally performed annually for projects that are meant to be implemented. However, for project that are already underway, companies can apply these tools monthly in order to have greater control of the entries and Cash outflows.

A relevant concept within the cash flow is non-disbursable expenses. These are expenses that do not represent an outflow of real money for the company, but they can be used for accounting purposes in order to reduce the profit on which taxes are calculated. Some examples of non-disbursable expenses are the depreciation of assets and amortization of debts.

In addition, it is necessary to emphasize that the percentage of tax burden (**taxes**) will vary within the cash flows depending on the tax legislation of each country.

Note: Amortizations are considered non-disbursable expenses, because they constitute the reduction of a debt;. For example, if a loan is granted, it is reflected in the interest paid in each installment.

Amortization is considered an expense and, therefore, it is possible to deduct it from the payment of taxes.

Steps to develop a cash flow

Step 1. Define the project investments using the investment plan matrices (page 76).

Step 2. Define your income (amount available for sale multiplied by the sale price).

Step 3. Define your costs, for this you can use figure 18, where the information of the cost structure is generated (page 71).

Step 4. Proceed to fill in the following structure.

Table 21. Guiding matrix for drawing up a cash flow

Aspect	Year 0	Year 1	Year n
Sales		\$	\$
Other income		\$	\$
Total operating income		\$	\$
Supplies		\$	\$
General expenses		\$	\$
Personnel		\$	\$
Total operating costs		\$	\$
Non-disbursable costs		\$	\$
Interest (on debt)		\$	\$
Profit before tax		\$	\$
Income tax (%)		\$	\$
Profit after tax		\$	\$
More non-disbursable expenses (depreciation)		\$	\$
Operation flow		\$	\$
Investments:			
Land	\$		
Machinery and equipment	\$		
Working capital	\$		
Total investments	\$		
Net cash flow	\$	\$	\$
Accumulated cash flow	\$	\$	\$

Applied example

The following table shows a didactic example of cash flow applied to a coffee seedling business or project that intends to produce a quantity of 50,000 plants, at a unit sale price of \$0.25. Some assumptions that are made for this example are:

- ☞ A time horizon of 5 years.
- ☞ The quantity of plant sales remains the same during the 5 years.
- ☞ An increase in the costs of supplies and personnel of 2 % per year.
- ☞ Production time is annual.

Table 22. Example of a cash flow for a coffee nursery project.

Aspect	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Sale of seedlings		\$ 12,500.00	\$ 12,500.00	\$ 12,500.00	\$ 12,500.00	\$ 12,500.00
Total operating income		\$ 12,500.00	\$ 12,500.00	\$ 12,500.00	\$ 12,500.00	\$ 12,500.00
Supplies		\$ 2,289.35	\$ 2,335.14	\$ 2,381.84	\$ 2,429.48	\$ 2,478.07
General expenses		\$ 3,000.00	\$ 3,000.00	\$ 3,000.00	\$ 3,000.00	\$ 3,000.00
Personnel		\$ 2,197.70	\$ 2,24.65	\$ 2,286.49	\$ 2,332.22	\$ 2,378.86
Total operating costs		\$ 7,487.05	\$ 7,576.79	\$ 7,668.33	\$ 7,761.69	\$ 7,856.93
Non-disbursable costs (depreciation)		\$ 719.63	\$ 719.63	\$ 719.63	\$ 719.63	\$ 719.63
Profit before tax		\$ 4,293.32	\$ 4,203.58	\$ 4,112.04	\$ 4,018.68	\$ 3,923.44
Income tax (30 %)		\$ 1,288.00	\$ 1,261.07	\$ 1,233.61	\$ 1,205.60	\$ 1,177.03
Profit after tax		\$ 3,005.32	\$ 2,942.51	\$ 2,878.43	\$ 2,813.07	\$ 2,746.41
More non-disbursable expenses (depreciation)		\$ 719.63	\$ 719.63	\$ 719.63	\$ 719.63	\$ 719.63
Operation flow		\$ 3,724.95	\$ 3,662.14	\$ 3,598.06	\$ 3,532.70	\$ 3,466.04
Investments:						
Land						
Physical works	\$ 1,522.95			\$ 1,138.80		\$ 1,138.80
Machinery and equipment	\$ 366.00					
Working capital	\$ 7,487.05					
Total investments	\$ 9,376.00					
Net cash flow	\$ -9,376.00	\$ 3,724.95	\$ 3,662.14	\$ 2,459.26	\$ 3,532.70	\$ 2,327.24
Accumulated cash flow	\$ -9,376.00	\$ -5,651.05	\$ -1,988.91	\$ 470.35	\$ 4,003.05	\$ 6,330.29

In the example above, the company makes an initial investment of \$9,376 and although the cash flow during the first year provides a positive result, when comparing it with the initial investment, the accumulated cash flow gives a negative result. This is because the investment is not yet recovered until year 3, where the company shows positive results. However, to analyze net cash flows, it is necessary to have indicators such as the Net Present Value (NPV) (page 102), the Internal Rate of Return (IRR) (page 103) and the Cost/Benefit Ratio (page 104); which are the parameters used to measure the profitability of the business and to assess whether the investment is economically viable to execute.

Recommended Best Practices When Performing Cash Flow Analysis

What best practices are recommended when analyzing the cash flow of a company?

In order to complete an adequate analysis using the cash flow tool, it is recommended to implement the following good practices:

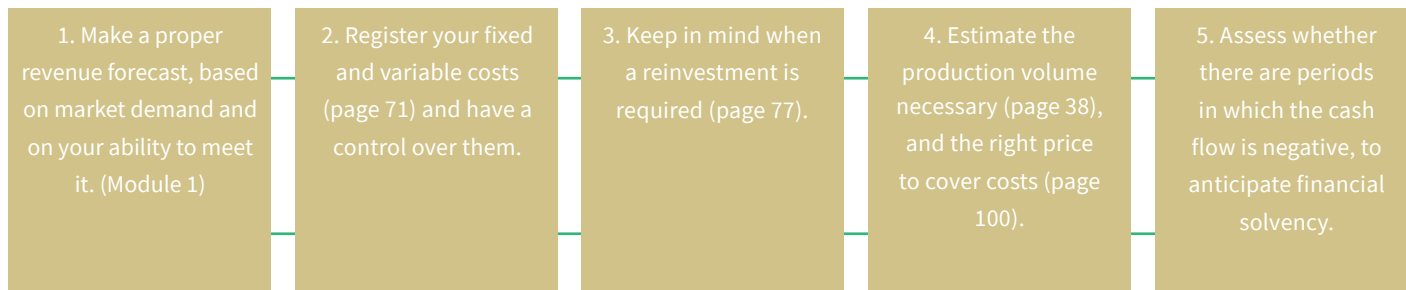


Figure 31. Best practices when making a cash flowchart.

PROFITABILITY ANALYSIS

WHAT IS A PROFITABILITY ANALYSIS?

A profitability analysis allows for a company to understand their capacity to generate profits, or the capacity of a project to exceed the resources invested in it. This module will delve into the profitability analysis of a project.

WHICH INDICATORS ARE USED TO MEASURE THE PROFITABILITY OF A PROJECT?

To measure the profitability of a project, different indicators are used such as the **Net Present Value (NPV)**, the **Internal Rate of Return (IRR)**, the **Benefit/Cost Ratio** or profitability index (PI), and the investment recovery period. However, the most common are the first three indicators.

NET PRESENT VALUE (NPV)

The **NPV indicator** is an indicator that is used to evaluate long-term investment projects (such as the sowing of a new lot to produce seed), which allows companies to evaluate whether the investment meets the objective of maximizing profits.

This is one of the most common indicators used.

The NPV allows the entrepreneur or investor to know how much the money they will receive will be worth, compared to the value of money in the present. Therefore, in order to understand this concept, it is necessary to understand the tip below:

Tip: If you want to buy land today, the money that you will use to acquire that land will be much greater than the money that was available 20 years. The reason for this is that money loses its value over time, (i.e. the value of money 20 years ago is not the same today due to inflation).

To calculate the NVP the following formula is used:

$$NVP = -I + \frac{R1 + R2 + R3}{(1+k) (1+k)^2 (1+k)^3}$$

Legend:

- 🔗 I = Initial Investment
- 🔗 R1, R2, and R3 = Future cash flows for the period
- 🔗 k = Minimum acceptable return (discount rate)

Example: Imagine a coffee nursery producer makes an initial investment of \$40,000, and the cash flows result in the following:

Year 1: \$10,000

Year 2: \$16,000

Year 3: \$20,000

The producer has a discount rate of 5 % as the minimum acceptable return. Using this, they proceed with the calculation of the Net Present Value (NPV)

$$\begin{aligned}
 NVP &= -I + \frac{R1 + R2 + R3}{(1+k) (1+k)^2 (1+k)^3} \\
 NVP &= -\$40.000 + \frac{\$10.000 + \$16.000 + \$20.000}{(1 + 0,05) (1 + 0,05)^2 (1 + 0,05)^3} \\
 \text{VAN} &= \$1.313,03
 \end{aligned}$$

In this case, having a value greater than 0 means that the investment is profitable.



On many occasions, associates, entrepreneurs, or investors must decide where they will invest their economic resources, to generate more money. The investor values the financial interest or yield that they want to obtain on the money they invests, this yield is known as the **entrepreneur's discount rate**.

The discount rate is calculated according to the investment alternatives, or use of the money, that the entrepreneur has. For example, if a coffee seedling producer has money saved in the bank and wants to invest it in their business, the producer will expect that investment to generate at least the same amount generated by being in fixed term deposit at the bank. This means that, if per year the producer received a 5 % profit on their revenue, then it is desirable to receive at least the same percentage when investing it in their business. In other words, the discount rate is the percentage of profit that the investor will have on their investment.

It is important to be clear about the concept of the discount rate, since it is used within the calculation of the Net Present Value (NPV) in order to understand the future value of the money that is invested in the present.

To accept the future investment, the NPV must be greater than 0. If the result is less than 0, it means that the project will not be profitable. Therefore, it will generate a loss when investing. On the other hand, when the NPV equals 0, it is up to the entrepreneur to decide whether to invest or not. This is summarized in the following figure:

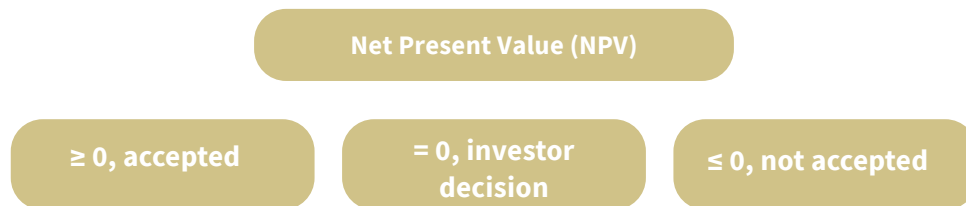


Figure 32. Summary of decision criteria for the indicator Net Present Value (NPV).

The higher the number of the NPV result, the more profitable the project will be.

INTERNAL RATE OF RETURN (IRR)

The Internal Rate of Return is an indicator that **establishes the annual yield generated by the investment**.

This indicator is calculated as a percentage.

To calculate the IRR the following formula is used:

$$IRR = I = \frac{R1 + R2 + R3}{(1 + r) (1 + r)^2 (1 + r)^3}$$

Legend:

- 🔗 I = Initial Investment
- 🔗 R1, R2, and R3 = Future cash flows for the period
- 🔗 r = Rate of return that verifies the equation
(calculated by an iterative process)

Companies must carry out projects where the IRR is higher than the minimum acceptable profitability. If there are

several projects in which you want to invest, the ideal is to invest in the one with the highest rates of return.

To assess the profitability of the investment, it is necessary to compare the IRR against the discount rate. If the IRR is greater than the discount rate, then the project is considered profitable.

Note: Calculating the IRR is complex when done manually, since the quadratic equations can complicate the calculation of the rate of return that verifies the equation. For this reason, it is recommended to use a financial calculator or a spreadsheet that allows the user to calculate the IRR value without any inconvenience (that is why it is called an iterative process).

COST/BENEFIT RATIO

The Cost/Benefit ratio indicator is also known as the profitability index. It shows a comparison between income and costs at present value, and indicates how profitable and attractive the investment is. To calculate this index the following formula is used:



Figure 33. Formula for calculating the Cost/Benefit indicator.

If the result of the indicator is greater than or equal to 1, then the project is profitable ($B/C \geq 1$). If the result is less than 1, then this indicates that the project is not profitable ($B/C < 1$).

Applied example

Financial indicators allow companies and individuals to assess the return on investment. Before assessing these indicators, it is necessary to have a cash flow. For this example, the results of the cash flow shown in the previous figure will be used.

Net cash flow	\$ -9,376.00	\$ 3,724.95	\$ 3,662.14	\$ 2,459.26	\$ 3,532.70	\$ 2,327.24
Accumulated cash flow	\$ -9,376.00	\$ -5,651.05	\$ -1,988.91	\$ 470.35	\$ 4,003.05	\$ 6,330.29

Discount rate	12%
Net Present Value (NPV)	\$ 2,185.37
Internal Rate of Return (IRR)	22%
Ratio (B / C)	1.23

Interpretation: This case is based on an assumption that the investor demands a return of 12 % of the investment. A result an NPV of \$ 2,185.37 is obtained which indicates that the investment is profitable, since the result is greater than 0.

On the other hand, the IRR is higher than the discount rate in the example. This indicates that the investment generates a higher return than that required by the investor. This is a good parameter. Finally, the Cost/Benefit ratio gives a value of 1.23, which is also a good indicator since it shows that the benefits obtained exceed the costs by 0.23. In conclusion, the investment project of 50,000 plants in coffee nurseries will likely be profitable.



Download [here](#) the Excel tool or scan the following QR code to build your company's cash flow and analyze the NPV, IRR and B/C indicators.

This information can be found on sheet "5. Cash Flow and Prof. Analysis." Of the Excel tool.



RECOMMENDED BEST PRACTICES IN THE ANALYSIS AND INTERPRETATION OF PROFITABILITY

Which best practices are recommended when analyzing and interpreting the profitability of a business or project?

It is recommended to implement the following best practices when carrying out an adequate analysis and interpretation of the profitability of the business:

To make a decision regarding the investment of a project, it is necessary to have: a positive NPV, an IRR greater than the Discount Rate and a B/C ratio greater than 1.

When presented with several investment options, the one with the highest indicators should always be prioritized.

One aspect to consider is that the IRR will vary depending on the fund structure of the project or business. For example, for projects or businesses that start with negative flows and then show positive flows, the recommendation will always be to invest in those with the highest IRR.

On many occasions, the NPV is the best indicator to make an investment decision since this shows the profit that will be obtained at the end of the project, in real terms.

Figure 34. Best practices to analyze and interpret profitability.



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