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SCHOOL OF EDUCATION AND FOREIGN LANGUAGES

ANALYSIS AND TRANSLATION OF "POLÍTICA PÚBLICA DEL SECTOR AGROPECUARIO COSTARRICENSE 2023-2032" FROM SPANISH INTO ENGLISH AND "THE AVOCADO INDUSTRY IN ISRAEL" FROM ENGLISH INTO SPANISH FOR COOPERATIVA DE PRODUCTORES Y COMERCIALIZADOES AGRÍCOLAS.

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Abstract

The main focus of this research project is to investigate the effect of procedure and methods of used to translate documents "Política Pública del Sector Agropecuario Costarricense 2023 - 2032" from Spanish into English and "The Avocado Industry in Israel" from English into Spanish for Cooperativa de Productores y Comercializadores Agrícolas. Since this work apply the qualitative research, collecting and analyzing non-numerical data is principal to understand concepts, opinions, and experiences of many translation studies in order to create a good quality technical translation of the documents. This research project also highlights a deeply analysis of the source text and the process used in the translation, such as grammar structures, vocabulary, text style, and, most importantly, translation techniques. It is important to mention that, even though both documents are related to agricultural field, it doesn't mean that its level of difficulty are simple. Nevertheless, both texts applied technical structures, terminologies, and words that is not common use in the daily basis, allowing the used of translation technique to be applied in both texts in order to acquired professionalism, comprehensive, naturalness, and coherence in the translation. The conclusion of this work is to analyze the different processes using translation theory to render a closest coherence translation similar to the source language message within informative communication.

Resumen

El objetivo principal de este proyecto de investigación es investigar el efecto de los procedimientos y métodos de traducción utilizados para traducir los documentos "Política Publica del Sector Agropecuario Costarricense 2023 - 2032" del español al inglés y "The Avocado Industry in Israel" del inglés al español para la Cooperativa de Productores y Comercializadores Agrícolas. Como este trabajo aplica una investigación cualitativa, es importante la recolección y análisis de datos no numéricos para comprender conceptos, opiniones y experiencias de muchos estudios sobre la traducción para crear una traducción técnica de buena calidad de los documentos. Este proyecto de investigación también destaca un profundo análisis del texto de partida y del proceso utilizado en la traducción, tales como las estructuras gramaticales, el vocabulario, el estilo del texto y, lo más importante, las técnicas de traducción. Es importante mencionar que, aunque ambos documentos estén relacionados al campo de la agricultura, no significa que su nivel de complejidad sea simple, al contrario, se aplican a ambos textos estructuras técnicas, terminología y palabras que no son comunes de manera cotidiana. Permitiendo así el uso de las técnicas de traducción aplicados en ambos textos para obtener una traducción profesional, completa, natural y coherente. La conclusión de este trabajo es de analizar los diferentes procesos que utiliza la teoría de la traducción para obtener el equivalente natural más cercano igual a la lengua de partida dentro de una comunicación informativa.

Chapter I

Introductory Framework

Translation is critical in bridging language barriers and enabling effective communication between individuals and communities of different languages. It allows people from diverse linguistic backgrounds to understand and interact with each other, fostering cultural exchange, business collaborations, diplomacy, and mutual understanding.

Chapter I takes deep research of several topics about the analysis and translation of some documents "Política Publica del Sector for Cooperativa de Productores y Comercializadores Agrícolas (APACOOP)" from Spanish into English and from English into Spanish. It will talk about the problem statement, objectives of the investigation, justification of the study, antecedents, and scope.

1.1 Problem Statement

Several factors influence the documents' often not going beyond their original language. This can be limited resources, language complexity, commercial viability, legal and copyright issues, cultural and contextual challenges, prioritization and demand, commercial viability, lack of translators available to work on them either pro-bono or not, along with legal and time constraints, legal and time constraints and time constraints. Therefore, the problem directly affects the APACOOP cooperative, with some documents in English into Spanish and Spanish into English that need to be translated as soon as possible.

If these documents cannot be translated, the outcome would be better communicated due to the unsuccessful document not being translated in time. Additionally, readers will

lose a lot of context and information. They may need help understanding the context, connections, or references made within the document.

With over 30 years of being an entrepreneur group, the APACOOP cooperative is in Santa Cruz, San Jose, Costa Rica. Focusing on commercialization, capacitation, innovation, growth focus, and strengthening of the area and its population.

APACOOP contacted the researcher to help them with their problem with the documents; however, since APACOOP could help the researcher, the deadline for the translated documents is still being determined, but it is preferable to be delivered before January 1, 2024.

It is important to translate these documents because APACOOP will benefit cross-cultural communication, enabling an effective message between individuals or organizations that speak different languages. The information can be shared across language barriers, fostering understanding, cooperation, and collaboration on a global scale. In the business world, translations are essential for international trade and commerce. Companies must translate contracts, agreements, marketing materials, product descriptions, and other business documents to engage with customers, negotiate deals, and expand into new markets.

APACOOP's employees and their clients are affected by this problem. For that reason. What is the effect of the procedure and methods used to translate documents "Política Pública del Sector Agropecuario Costarricense 2023 - 2032" from Spanish into English and "The Avocado Industry in Israel" from English into Spanish for Cooperativa de Productores y Comercializadores Agrícolas?

1.2 Objectives of the Investigation

The objectives are crucial because they provide a clear direction, purpose, and focus to the investigation process. This part serves as a roadmap to understand the main objectives easily.

1.2.1 General Objectives.

To analyze the effect of procedure and methods used to translate the documents *"Política Pública del Sector Agropecuario Costarricense 2023 - 2032"* from Spanish into English and *"The Avocado Industry in Israel"* from English into Spanish for Cooperativa de Productores y Comercializadores Agrícolas.

1.2.2 Specific Objectives.

- To translate the documents *"Política Pública del Sector Agropecuario Costarricense 2023 - 2032"* from Spanish into English and *"The Avocado Industry in Israel"* from English to Spanish for Cooperativa de Productores y Comercializadores Agrícolas.
- To apply various translation techniques to the documents in order to achieve communicative texts.
- To evaluate the effect of the translation techniques applied on the documents.
- To create a glossary with the most relevant terminology found in both texts.

1.3 Justification of the Study

Language barriers may be overcome, and efficient communication between persons and communities who speak various languages is made possible via translation. It promotes cultural exchange, commercial partnerships, diplomacy, and mutual understanding by

making it possible for people from various language backgrounds to communicate and interact with each other. Every type of translation requires a high precision grade, allowing every translated document to be as accurate as the original. Even though some translations could be better, they can be coherent for the other language and make the translation work not noticeable.

In many cases, some institutions cannot contact translators, so organizations rely on students close to finishing their majors to get their assistance translating important documents. Such a task becomes a great help for the student/researcher as such translations are usually their last requirement before getting their degree in Translation. The task the translator undertakes is crucial for effective communication. Translations are crucial for effective communication; they facilitate interactions between individuals and communities worldwide, so the main objective of the investigation is to allow the reader to understand these documents in a coherent way.

APACOOP's employees and their clients will benefit from the future investigation, making it possible for the clients to understand the company's products easily. At the same time, the researcher will benefit from these translations by learning and experiencing new knowledge, general culture, vocabulary, and translation techniques.

The researcher will use internet access as a valuable tool to research both topics deeply and use dictionaries that make the researcher's work more accurate. Similarly, the researcher will use different translation procedures and methods and text edition, which refers to reviewing, revising, and editing a translated text to ensure its accuracy, clarity, coherence, and fluency. Since both documents' topics use difficult vocabulary that is rare

for the researcher, it makes the investigation more valuable in learning, knowledge, and the glossary's creation and useful tool for the researcher. Lastly, the researcher will consider suggestions from professionals and experts in translation.

1.4 Antecedents

There are many theories regarding the history of translation. Dating back to the earliest civilizations, clay tablets with bilingual Sumerian-Akkadian texts were found in Mesopotamia, a historical region of Western Asia situated within the Tigris-Euphrates River system. These texts indicated early translation practices around the 3rd millennium BCE. Similarly, translation played a role in ancient Egypt, particularly in the context of religious and administrative texts.

From the 1900s to the 1930s, Translation studies as an academic discipline occurred. Scholars began to analyze and theorize translation as a complex linguistic and cultural activity. Notable figures in this field included Russian linguist Roman Jakobson, a pioneer of structural linguistics. Jakobson developed revolutionary new techniques for analyzing linguistic sound systems during the twentieth century, founding the modern discipline of phonology. Another important figure during this age was Ezra Pound, an expatriate American poet and critic. In Pound's point of view, a translated text might be interpretive as the reader finds textual features similar to poems, or a translation text can be original writing as to whether a new poem has been created. At the end of the 1930s, Translation was viewed as a separate linguistic practice.

During the 1940s and 1950s, the world faced an extremely difficult situation. Events such as the Wall Street Crash of 1929 were the most devastating stock market crash in the history of the United States and, afterward, a global conflict that lasted from 1939 to 1945. Translators played a crucial role during World War II. They worked as military interpreters, translators of diplomatic documents, and propagandists. Their efforts were vital for communication, negotiation, intelligence gathering, and cultural exchange between different nations involved in the conflicts. Once World War II ended, translators were notable and well respected during the Nuremberg Trials, ensuring effective communication and language support throughout the legal proceedings. Translators provided simultaneous interpretation services for the first time during the trial proceedings. As the proceedings were conducted in multiple languages, including English, German, French, and Russian, translators worked in soundproof booths. They provided real-time interpretation to enable judges, prosecutors, defense attorneys, and defendants to understand and communicate quickly in their respective languages. With their linguistic skills and expertise, translators contributed to the overall fairness and effectiveness of the trials, making people realize the importance of translators and interpreters during important reunions, allowing for the proper presentation and understanding of communication.

Outside the devastating world, there were discussions among translators, and the concept of "translatability" took place. Translatability refers to the quality or degree to which a text or piece of information can be effectively translated from one language to another while retaining its meaning, intent, style, and cultural nuances. It encompasses the suitability and feasibility of translating a particular text or content accurately and

effectively. The concept of translatability recognizes that only some documents and text are equally easy to translate; some texts, due to their content, structure, language intricacies, or cultural references, may pose greater challenges in achieving a successful translation. On the other hand, some texts may exhibit high translatability, meaning they can be more easily and accurately rendered into another language.

During the 1960s to 1970s, researchers and practitioners began exploring using computers for translation. Machine translation (MT) systems, based on computational linguistics and natural language processing, started to emerge. The main focus was developing algorithms and models to automatically translate texts between languages. Unfortunately, this new feature was in development and sometimes incoherence. During this period, the main concept in translation studies is "equivalence," which refers to the relationship between the source language (SL) and target language (TL) texts, aiming to capture the meaning, intent, and effect of the SL text in the translated version. George Mounin (1963), known for being a French linguist, translator, and semiotician, negates the concept of "relativity" and instead draws on the concept of "equivalence," which guides the translators in their endeavor to convey the message and essence of the SL text accurately and appropriately in the target language. Achieving perfect equivalence in translation is challenging, as languages have different structures, cultural nuances, and linguistic peculiarities. Translators must make choices and compromises to balance various types of equivalence and produce a translation that effectively conveys the meaning and intent of the SL text in a culturally and linguistically appropriate manner. Similarly, translators must bridge the gap between languages, cultures, and contexts, ensuring effective communication and enabling the

target audience to understand and engage with the translated text as closely as possible to the original.

During the 1980s to 2000s, the field of translation witnessed significant developments and transformations. The introduction and rapid advancement of computer technology profoundly impacted translation, featuring the computer-assisted translation (CAT) tools implemented in translation memory and terminology management systems, which became widely used in the translation community, increasing translation efficiency and consistency. The internet also revolutionized the accessibility of information and facilitated global collaboration among translators. On the other hand, MT technology advanced significantly during this period. Rule-based and statistical MT systems were developed, leveraging large bilingual corpora and advanced algorithms to translate text automatically. While MT continued to evolve, it became more widely used for certain types of content, especially in domains where speed and cost efficiency were prioritized over nuance quality.

In the present day, the world of translation continues to evolve and adapt to the changing global landscape. MT technology has made significant progress since its creation, Thanks to neural machine translation (NMT) and artificial intelligence (AI) developments. NMT models have improved translation quality, enabling more accurate and natural-sounding translations. On the other hand, the use of AI and machine learning algorithms continues to enhance MT capabilities, although human post-editing remains crucial for ensuring high-quality translation.

MT has made significant advancements in recent years, driven by AI and neural network model developments. People believe that it is easy to use an MT instead of a professional translator, but in fact, translators use MT as a tool to help them progress in translation. According to Doug Arnold (2003), the challenges and limitations of MT are classified into four groups: MT does not completely determine content, content does not completely determine the form, different languages use different structures to convey the same interpretation and the description problem, this last one uniting the first three problems altogether.

Retranslation refers to translating a text previously translated into another language. It involves revisiting a previously translated work and producing a new translation of the same ST. Paul Bensimon (1990) claims that there are essential differences between first translations and retranslations. According to Bensimon, first translations are often "naturalizations of the foreign works, and they worked as introductions, seeking to integrate one culture into another." Retranslations can occur for various reasons, such as improving the quality of the translation, updating the language to align with contemporary norms, or offering a fresh interpretation of the original. Antoine Berman (1990) outlines his ideas of retranslation as "a way of or space for accomplishment."

We can see many examples of retranslations with various documents. Fortunately, Costa Rica could translate some of Shakespeare's works and poems into Spanish, translations made by J.B.Acuña and J. Gutiérrez from 1981 to 1998. The journal titled "Nuevas traducciones de Shakespeare en Costa Rica" by Hiram Antonio Castro Carvajal (2002) explains the process of this translation. Even though these stories had already been translated, he and some of his co-workers improved these translations over ten years.

Castro Carvajal explains the benefit and recognition of translating some of Shakespeare's works made in Costa Rica. They could translate half of the poems, two comedies, seven tragedies, and one historical drama.

A translated document has the potential to influence others and people's ideology. These factors can include the content of the document, the individuals reading it, their existing beliefs and perspectives, and the historical context. This last one can be seen in the analysis of the play "El pájaro azul" (L'Oiseau bleu), translated by Roberto Brenes Mesén. The analyzer, Francisco Javier Vargas Gómez, explains how the play's translation could encourage ideological, social, and aesthetic changes in 20th-century Costa Rican society. Vargas Gómez emphasizes that "El pájaro azul" affected most readers in ideological, moral, and modernist ways.

1.5 Scope

It is expected that both APACOOP's employees, their clients, and the researcher will benefit from this investigation, but each has an individual goal with the documents.

1. The researcher will be benefited by generating knowledge across the investigation project. The researcher will strive to gather information, data, and evidence to enhance the researcher's understanding, challenge existing theories, or provide insights into previously unexplored documents. At the same time, APACOOP's employees and clients will benefit from translated documents to easily understand and expand their business with future clients worldwide.
2. The research project will not only provide valuable insights into the translation of some documents. However, it will also offer the researcher a unique opportunity for

intellectual growth and professional development in their respective area of expertise. Engaging in this project will allow the researcher to delve deeper into the intricacies of translation, expanding their knowledge base and refining his skills. The researcher will have the chance to explore new perspectives, analyze data, and contribute to the existing body of knowledge in translation. Moreover, this project will enable the researcher to forge connections with other experts, fostering collaboration and opening doors for future academic and professional opportunities.

3. The project's primary focus is to obtain all the translated documents before January 2024. The researcher set a deadline for completing the translated documents on time. Meeting this deadline is crucial as it aligns with the broader timeline and objectives of the project. The researcher understands the importance of timely document completion to ensure smooth progress and facilitate subsequent stages of the project. By setting a personal deadline to finalize the translated documents, the researcher aims to maintain a structured workflow, adhere to project milestones, and fulfill their responsibilities within the designated timeframe.
4. The population around the APACOOP building is in Santa Cruz, San Jose, Costa Rica. The population around the APACOOP building represents a vibrant mix of individuals from different backgrounds, contributing to the local community's cultural richness and social fabric.
5. Translating these documents will enable foreign people to understand APACOOP's goals and ideas clearly. It is important to have documents available in a foreign language to facilitate smooth communication for individuals who may need to be proficient in the language or need help understanding and reading the original documents.

Chapter II

Theoretical Framework

Chapter II deeply researches theories, concepts, meanings, and ideas about text analysis, translation procedures, the importance of glossaries in translation, and how to elaborate it. It provides a conceptual framework within the opinions of distinct authors, translators' theorists, and the researcher's opinion to provide valuable information and credibility during the chapter.

2.1 Text Analysis

It refers to the systematic examination and evaluation of the source text before the translation process begins. It involves analyzing the linguistic, cultural, and contextual aspects of the source text to gain a thorough understanding of its content, style and intended meaning. Text analysis provides translators with a foundation of knowledge and insights into the source text, enabling them to make informed decisions throughout the translation process. Newmark (1988) recommends reading the original text to understand its context and then analyzing it from a translator's point of view. Newmark also mentions the author's purpose when analyzing an SL text as the intended reason for the topic being analyzed. Newmark also suggests not including the life of the author, their background, or their other works if they worked on any previously, unless it is important for the text analysis. However, most of the time, these three features are not important to include. According to Dicerto (2018), translations are changing due to source texts having changed as well; nowadays, translators do not communicate by just adding text; now, translation is an activity that is more complex and cannot be accounted for in linguistic terms any longer.

2.1.1 Text Styles.

Text styles refer to the several types of literary or non-literary text found during the text analysis. According to Newmark (1988), there are four types of text styles: Narrative, a dynamic sequence of events where the emphasis is on the verbs or, for English, "dummy" or "empty" verbs plus verb-nouns or phrasal verbs ("He made a sudden appearance," he burst in). A dynamic sequence of events united by a concept, idea, or plot to tell a story (Ghenaeit, 2023). Description: static, emphasizing linking verbs, adjectives, and adjectival nouns. Discussion: a treatment of ideas, emphasizing abstract nouns (concepts), verbs of thought, mental activity (consider, argue, etc.), logical argument, and connectives. Dialogue: with emphasis on colloquialisms and fanaticisms.

2.1.2 Stylistic Scales.

During the analysis of a translation text, the scale of formality is used to provide a framework for evaluating the linguistic and stylistic choices made by the translator and understanding how they impact the overall style and tone of the translation. Newmark (1988) takes three examples of scales that are the following.

2.1.2.1 Scale of Formality.

In the field of translation analysis, one crucial aspect that demands meticulous examination is the level of formality or informality conveyed within the translated text. The assessment of formality within translations is of paramount importance as it can significantly influence the way a message is received and understood by the target audience. According to Newmark (1988), he suggests eight examples of formality, which

provides invaluable insights into this aspect. The formal scale may be divided as the following:

Officialese: The consumption of nutriments is categorically prohibited in this establishment

Official: The consumption of nutriments is prohibited.

Formal: You are requested to refrain from consuming food in this establishment.

Neutral: Eating is not allowed here.

Colloquial: You can't feed your face here.

Slang: Lay off the nosh.

Taboo: Lay off the fucking nosh.

In the previous example, the formality of the text is noticeable at the beginning, but little by little, the formality disappears, and the message sounds more informal; however, the message is still the same. Careful examination of formality in translations is far from a mere linguistic exercise; rather, it holds profound implications for effective communication. The translator's choice of formality can significantly impact the reception of the message, the cultural appropriateness of the translation, and even the persuasive or authoritative tone conveyed to the audience. Some factors, such as vocabulary choices, sentence structure, and tone, determine whether the translation reflects a more formal or informal register than the source text.

2.1.2.2 Scale of Generality or Difficulty.

The assessment of text difficulty holds profound significance, as it can influence the accessibility, comprehension, and overall reception of the translated content. This scale assesses the level of difficulty in the translated text. According to Newmark (1988), he suggests using five examples of difficulty:

Simple: The sea floor has rows of big mountains and deep pits.

Popular: The floor of the oceans is covered with great mountain chains and deep trenches.

Neutral: (using basic vocabulary only) A graveyard of animal and plant remains lies buried in the earth's crust.

Educated: The latest step in vertebrate evolution was the tool-making man.

Technical: Critical path analysis is an operational research technique used in management.

Opaquely technical: (Comprehensible only to an expert) Neuraminic acid in the form of its Akali-stable methoxy derivative was first isolated by Klenk from gangliosides (Letter to Nature November 1955, quoted in Quirk, 1984.) (Newmark, 1988).

Some factors, such as the language complexity, the translator's expertise, and the desire for quality of the translation, are completely essential to consider. Each of the previous examples demonstrates the difficulty of speaking according to whom the message is received. For example, a popular scale involves a lexicon used in day-to-day life. Contrary to the Opaquely technical scale, which uses more complex vocabulary that only experts may understand.

2.1.2.3 Scale of Emotional Tone.

Continuing with emotional tone, this scale assesses the level of emotion in the translated text. It can hold an immense significance to the reader's engagement, empathy, and connection with the content. Newmark suggests using four examples of emotional tone, which are the following:

Intense: The message is conveyed using intensifiers (Absolutely wonderful, ideally dark bass, enormously successful, superbly controlled).

Warm: The message is conveyed with a gentler vocabulary found within the text (Gentle, soft, heart-warming melodies).

Factual: The message is conveyed using or consisting of facts (Significant, exceptionally well judged, personable, presentable, considerable).

Understatement: The message is conveyed with descriptions that make it serious or less impressive (not…undignified).

It considers several factors such as vocabulary emotion, cultural sensitivity, context of the source text, and tone adaptation. Translators need to understand the emotional nuances of the source text and apply appropriate techniques and strategies to convey the emotional tone effectively in the translation.

2.1.3 Text Function.

Also known as language function, it refers to the different communicative purposes or uses of language that translators need to consider when transferring meaning from the

source language to the target language. Newmark (1988) recommends that all translations are built indirectly on a theory of language. Translators must understand the language functions present in the source text and accurately convey them in the translation to ensure effective communication in the target language. Newmark used Buhler's functional theory of language to apply to translating features. The following mentions three main functions of language.

2.1.3.1 Informative.

This function focuses on providing information, such as describing facts, explaining concepts, or conveying knowledge. Translators must ensure that the information in the source text is accurate and transferred to the target language, maintaining the same level of clarity and comprehensibility. According to Newmark (1988), the external situation and facts of the topic are the core of the informative function. However, for the translation's purposes, any topic that requires knowledge or information is important to look up. This type of translation dominates text related to education, technology, science, media, commerce, etc.

2.1.3.2 Expressive.

The expressive function involves conveying emotions, feelings, attitudes, or subjective experiences. Translators must capture the emotional tone and nuances of the ST, conveying the intended emotions in the target language while considering cultural and linguistic differences. According to Newmark (1988), the mind of the speaker or the writer is the core of the expressive function, and Newmark mentioned three text types for the

expressive function. Moreover, it is essential for the translator to distinguish the personal components of this text, which are the following:

- *Serious imaginative literature:* Those texts are lyrical poetry, short stories, novels, plays, etc.
- *Authoritative statements:* Those texts are political speeches, important documents by ministers or party leaders, statutes and legal documents, and scientific, philosophical, and academic works written by acknowledged authorities.
- *Autobiography, essays, personal correspondence:* Those texts that are expressive when they are personal effusions when the readers are a remote background.

Newmark (1998) suggested that it is essential for a translator to identify these types of functions and analyze the essential keys of the expressive function.

2.1.3.3 Vocative.

This function aims to persuade or convince the readership or listener to act, think, or feel about the information in the text. Translators must effectively convey the persuasive strategies, arguments, or rhetorical devices used in the source text to achieve the desired impact in the target language, considering cultural and linguistic differences in persuasion techniques. According to Newmark (1998), the readership is the core of the vocative function since it calls the attention of the readership to react in the way intended by the text. This type of translation is mostly used in advertising, manuals, and political speeches.

2.1.4 Translation Methods

It refers to the specific approaches and procedures translators employ to transfer the meaning of a source text into a target language, according to Cuadra. Et Al (2019) explains the translation methods' definition by Hurtado Albir as procedures visible in the translation result, which is used to obtain the translation equivalence into textual micro units. These methods help translators address the linguistic, cultural, and contextual challenges they encounter during the translation process. Newmark (1998) remarks on the several types of translation, like translating a text literally or freely, and how the reader will react to these two decisions.

2.1.4.1 Semantic translation.

Unlike faithful translation, semantic translation captures the intended sense and significance of the source text rather than relying solely on literal translation. Semantic translation considers the context, cultural references, and intended message of the source text to ensure that the meaning is accurately conveyed in the target language. Newmark (1998) thinks that semantic translation is a free way for the translator to intuitively empathize with the original, allowing them to be more flexible and creative.

On the other hand, Hartono (2020) mentioned that semantic translation seeks to change the meaning of the source language regarding the contextual and cultural meaning that is different from the target language. Hartono uses as an example the two words "mom" and "madam" which have the same meaning in Indonesian, "Ibu." Nevertheless, these two words differ since "madam" refers to female people unrelated to the family blood.

2.1.4.2 Communicative translation.

Communicative translation prioritizes effective communication and aims to convey the intended message and function of the source text so that the audience will quickly find both content and language acceptable and understandable. The concept of communicative translation was proposed by Newmark (1988). He admitted it is the most important contribution to the translation theories. It is likely to be smoother, simpler, clearer, more direct, more conventional, conforming to a particular register of language, tending to under-translate, i.e., to use more generic, hold all terms in difficult passages. And comprehensible. Communicative translation attempts to produce on its readers an effect as close as possible to that obtained from the readers of the original.

2.2 Translation Procedures.

Also known as translation techniques or translation strategies, it refers to the various methods and approaches used by translators to transfer the meaning of a source language into a target language, according to Cuadra. Et Al (2019) explains the translation procedures' definition by Hurtado Albir, the procedures, conscious and unconscious, verbally and non-verbally, internals and externals used by the translator to fix the problems found in the development of the translation process and improve their effectiveness in the function of their specific requirements. These procedures help translators navigate the linguistic, cultural, and communicative challenges during the translation process. According to Newmark (1988), translation methods and translation procedures have their difference; translation methods are those that include the whole text, while translation procedures only involve sentences

and minimal parts of the text. However, Newmark remarks on the importance of these procedures in translation and the difference in contextual factors. This part will show different procedures employed based on the specific characteristics of the source text, the target language, and the translation objectives. At the same time, the point of view of different authors about these procedures is within the researcher's point of view.

2.2.1 Transposition.

Transposition is a translation technique that involves changing the grammatical form of the original language into a translation. Transposition can be divided into two forms: level shift and category shift. The level shift occurs when the transposition produces elements of the original language that are different from those of the translated language. Such shifts, in general, often occur from the grammatical level to the lexical level or vice versa. Category shift occurs when transposition produces a native language that differs in structure, word class, unit, and intersystem. Category shift consists of structural shifts due to structural differences between the two languages involved in translation so that the equivalent structure of the original language is different from the structure of the translated language. According to Newmark (1998), changing the word order is often unnecessary and "is more appropriate to translate with a lexical synonym, retain the word order, and forgo the transposition in order to preserve the stress" (p.88). Newmark also believes that gerunds are the most neglected of all translator’s transpositions; he does not mention why; instead, he uses an example that tries to

explain, but honestly, it is not sure what Newmark is trying to say and is confusing for the reader and the researcher.

It is important to understand that transposition can be different from shift. Rasul (2019), in his book, mentions the transposition definition by Vinay and Darbelnet (1995), "Translation procedure that simply involves a change in the word class without affecting the meaning of the message" (p.38). Unlike Newmark's definition, which only mentions changing a word, Rasul realized that changing the source text word does not affect the real meaning of the message, which is understandable for applying this type of procedure. Moreover, Rasul disagrees with Newmark's interchangeable terms of "transposition" and "shift"; he recommends avoiding using both words as synonyms because the correct term for shifts was given and accepted by Catford (1965).

Some authors see transposition and shifts as equal. Arief (2020) mentions the definition of transposition as "a technique that changes a grammatical category concerning the source language" (p.11). Unlike Rasul (2019), Arief interchanges the words "transposition" and "shifts," as Newmark does; Arief remarks that Transposition can also be called shifts and share the same definition and technique. According to Hartono (2020), the definition of transposition is to change a grammatical category; therefore, it is classified as an indirect technique. Hartono also mentioned that Catford (1965) said that transposition and "shift" are similar, and Machali (2009) categorized it into four types of transposition as the shifting forms:

- *Compulsory or automatic shifts:* Caused by language systems and grammatical rules, translators have no choice but to use a transposition technique.
- *Grammatical structural shift:* It happens when the source language grammar or structure is unavailable in the target language.
- Transposing is due to reasonable expressions because the source language equivalents are reasonable or unnatural in the target language.
- Transposing language unites, for example, words into phrases.

2.2.2 Modulation.

Modulation is a structural shift that occurs in transposition techniques, involving changes that involve a shift in meaning. It also changes the perspective, point of view, or other terms of the implied meaning or meaning. In a valid structural division, modulation can be seen in point-of-view shift and descriptive translation. Point of view shift occurs when the elements of the source language get equivalent in the translation language with a different semantic point of view. This shift occurs when the first language element acquires a second language equivalent/translation with a different scope of meaning, i.e., a broad range of meanings to a narrow range of meanings, or vice versa.

Meanwhile, descriptive translation provides a "description" containing the meaning of the word in question because the translator cannot find the translation/equivalent of the translated word. This can happen because the translator needs to learn or exist in the first language. According to Newmark (1998), he defined modulation as “a variation through a change of viewpoint, of perspective and very often of category

of through” (p.88). Newmark mentioned that there are eleven categories of modulation; however, Newmark's important one is the one called "negated contrary" (He prefers to call it "Positive for double negative"), which is a concrete translation procedure that can be applied in principle to any action or quality.

Modulation can work hand-to-hand if literal translation is on the text. According to Rasul (2019), he uses the definition of modulation by Vinay and Darbelnet (1995;39): "Variation of the form of the message, obtained by a change in the point of view" (p.39). Rasul remarks that modulation is justified when a literal translation outcome is in a grammatically correct expression. Otherwise, it would be considered unsuitable, unidiomatic, or awkward in the TL. Moreover, Rasul mentions that modulation can be obligatory or optional.

Correctly using modulation can make the translated text reflect its meaning in an easy and non-confused way. According to Arief (2020), modulation is "a technique that changes the point of view in the TL to focus or cognitive category concerning SL" (p.11). If the translator applies what Arief said, it can better reflect the intended meaning or highlight a particular conceptual framework. Arief adds that this translation procedure can allow the translation to express the same phenomenon easily and differently.

Modulation can apply to the context of the text or the cultural meaning of the target language. Hartono (2020) mentioned the definition of modulation as an indirect technique that allows the translator to change the point of view, either lexically or structurally. Hartono explains that this would depend on the point of

view of the translator and the culture of the text's meaning. Hartono uses the sentence "You are going to be a father" in Arabic as an example; if we want to translate this sentence into English, the correct way should be "You are going to have a child."Changing the word "father" to "child" in this context occurs because the point of view between Arabs and English speakers has different points of view culturally when they see the word "father" due to the concept of priority or high-level position given this word in the family tree. Therefore, even though the two words are different, they were applied correctly and still maintained the message.

2.2.3 Omission

Omission means the word is omitted or not translated. This method can be taken if the meaning has been conveyed by certain elements or if a word or expression is not essential. This is taken because it is in the development of the text and will only annoy the readers of the translation, according to Hansen-Schirra. Et al. (2017. 284) explain that omission is the disappearance of forms and dilution in virtual structures, in other words, the elimination of expressions, sentences, and paragraphs in the target texts.

Translators' theorists and researchers have debated the use of omission during a translation, or in this case, in an interpretation. Latif (2020) mentions distinct types of omission described by Barik during a text analysis of translation and interpreting quality and how this can improve or decrease the accuracy of a document or interpretation. It is possible that an interpreter can commit technical errors while using omission in their text. According to Lu (2018, as cited in Latif,

2020), simultaneous interpretations must be corrected in interpreters' performance through professional English-Chinese interpreters. Even though Lu had their reasons for explaining these mistakes, comparing the vocabulary level of English and Chinese is different from the correct way being Chinese is more difficult for interpreters, especially if it is simultaneous interpretation.

Omission can also be a reduction for some authors, and it is important to apply this procedure on different occasions, depending on the language. Arief (2020) mentions the definition of omission as "a technique that reduces certain elements of the SL" (p.11). Arief changes the name of omission to reduction, elimination, or subtraction due to this procedure only eliminating source language information in the target language. Arief explains the difference in the form times (verb tenses) in English and Indonesia as an example, mentioning how, in English, the verb tenses are important in a sentence. The time element will be easily understandable in the text, but the Indonesian language does not necessarily apply this same rule; the user must add the time description in this case.

This procedure may be more appropriate for some translators' theorists or, rather, called by another name. Hartono (2020) mentioned omission or reduction (as he preferred to call it) with Molina and Albir's definition (Molina and Albir, 2002, as cited in Hartono, 2020) as a technique that eliminates a word or item of information in the target language, but the definition still untouched. Hartono explained that this would depend on the translator if they saw it unnecessary to put the word into the target text. Unlike Arief (2020), Hartono explains the difference between omission and reduction techniques differently, describing (Varquez et al.,

2002, as cited in Hartono, 2020) that the omission technique is an unjustifiable suppression of elements. Hartono indirectly disagrees or dislikes the omission technique or prefers to call it reduction, even though it can share the same definition. However, according to other authors, Omission is necessary for a translated text if its application is justified and does not lose the text's message.

Omission needs more research among translators' theorists due to misinformation that some authors are given. According to Pym (2023), a situation about using omissions by interpreters was clarified. Pym mentions that when simultaneous interpreters make omissions, these omissions indicate a low-quality interpretation or a quick solution in some cases. These questions can easily be responded to and depend on each interpreter. Pym mentions that omission occurs when the translator does not care about the meaning and refuses to translate. It is the translator's work to investigate the meaning of each word, including those words that translators already feel familiar or barely know their translation. Eliminating words because the translator did not know their meaning is unacceptable and unjustifiable. Pym used as an example what the theorist Gerardo Vazquez-Ayora (2018) discussed about this situation. Ayora mentioned "paraphrasing" when translators do not know the meaning of a word. However, according to Ayora, this is an excuse to hide their lack of knowledge and is an easy solution when a translator needs to research the deep meaning of the word. Ayora also clarifies that translating a word is not explaining or commenting on a text, meaning that translation accurately communicates a message as coherently as possible into other languages, avoiding any omission or similar procedures if possible.

2.2.4 Amplification.

Amplification refers to expanding or elaborating on the content of the source texts in the translated version. In other words, it involves adding additional information, explanations, or details to ensure that the intended meaning of the source text is fully conveyed in the target language. Newmark (1988) regards this information as a "paraphrase," it is used when the text is poorly written or has important implications and omissions.

Even if it is a type of paraphrasing, some authors prefer not to call it that way. Rasul (2019) mentions the definition of amplification by Vinay and Darbelnet (1995;45): "Expansion occurs in translation when in the contrast of two languages, the SL uses more words for the expression of the same idea than the TL" (p.44). Rasul preferred to call it expansion, and he disagreed with Newmark's idea of comparing paraphrases or any other translation procedure as an example of amplification.

Amplification is commonly used when the word has a unique characteristic and is tough to translate into the target language. Arief (2020) defined amplification as "a technique that conveyed details that are not formulated or stated in SL" (p.9). This can apply either information or paraphrasing explicitly. Arief also mentions that addition or gain is a synonym of amplification, and he also adds to clarify the meaning of amplification as "grammatical expansion." As an example of amplification, the Spanish word "Anteayer" translated into English, must use the

amplification technique to be understandable for the reader in the target language, which would be "The day before yesterday."

2.2.5 Explicitation.

Explicitation refers to making implicit or implicit information in the source text more explicit or overt in the translated version. It involves clarifying, explicating, or elaborating on concepts, context, or implicit meaning to ensure greater transparency and comprehensibility in the target language. Baker (2018) cited Blum-Kulka's (1986) hypothesis notes, explaining that there is a general tendency in translation to raise the level of explicitness in the target language text. Explicitation is a universal strategy inherent in language meditation, as practiced by language learners, non-professional translators, and professional translators alike. In other words, with the previous information, Blum-Kulka explains that explicitation is a method that every translator can apply; it comes naturally. According to Badia (2020) in her book mentioned the hypothesis of explicitation by Blum-Kulka (1986) and how this hypothesis was verified by Øverås (1998). Øverås discovered that explicitation is associated with the tendency to prefer conventional instead of unique collocations. This shows that translation universals may present distinguishing characteristics but overlap to some extent. Pym (2023) mentions explicitation as the most studied procedure among the translators' theorists, clarifying what Blum-Kulka, Olohan, and Baker (2000) already said about this translation tendency, being explicitation as inherent in the process of translation, which postulates observed cohesive explicitness from the source language to target language text regardless of the increase traceable to differences between the two linguistic and textual systems

involved. Pym also concludes that translations tend to be more explicit than non-translations.

Explicitation can also be applied in several types of interpretations, and how the use of this procedure can affect the quality of the interpretation. Fu and Chen (2019) also examined explicitation in consecutive and simultaneous interpreting modes. They depended on the qualitative analysis of some explicitation examples used by government press conference interpreters.

Many authors have discussed different definitions of explicitation and how this affects the translation of a text. Latif (2020), in his book, applies the definition of explicitation by Vinay and Darbelnet (1985); they explain that explicitation is a simple stylistic translation technique that consists of making explicit in the target language what remains implicit in the source language due to its apparent from either the context or the situation. This means that explicitation is a type of translation procedure made up of either the target language or the source language due to the context of the text or the situation that makes the explicitation an important technique. Latif also mentioned in his book the definition of explicitation by Tang and Li (2020); they explain it as additions made by the interpreter or translator when they provide extra information which can be inferred from the context, being either quantitative or qualitative. Tang and Li came to this conclusion after analyzing twelve professional interpreters and twelve trainee interpreters in an audio-recorded interpreting speech from English into Chinese. Tang and Li also identified four types of explicitation and how professional interpreters use these strategies. Latif also mentioned in his book the definition of explicitation by

Shuttleworth and Cowie (2017); they mention that explicitation is not a procedure; instead, it is a phenomenon that frequently leads to target text stating source text information in a more explicit form than the source. In other words, there is a tendency for the translator or interpreter to add more explicit details in the target text compared to what was present in the source text. This can be a deliberate choice to ensure that the meaning is accurately conveyed to the readers of the translated text.

Translators frequently combine or use more procedures in their text; however, this can remain a new type of procedure. Matthew A. Kraus (2017), in his book, mentioned what Van der Louw (2000) thinks about the use of explicitation. According to Louw, explicitation is, indeed, making the implicit explicit; however, explicitation can appear in a combination of addition, explicitation, and contextual manipulation, making these three new types that he called "transformation."

Even though many authors have explained and defined the meaning of explicitation, the procedure needs more study among translator theorists to be clear for new translators. Rasul (2019) in his book mentioned the definition of explicitation by Vinay and Darbelnet (1995), which was previously mentioned by Latif (2020). However, Rasul untrust of Vinay and Darbelnet's definition, explaining that their concept of explicitation only is provided by the pronouns without further elaboration; in the end, translators theorists explored wide expensive research about this procedure. Rasul also cited Klaudy's (2009) model of explicitation typology and her four types of explicitation; however, as Rasul mentioned, Klaudy's works had been criticized among translation studies due to her

failure to exemplify it and not being completely clear to understand each category and their difference. Rasul concludes that explicitation is a confusing procedure that needs more study and avoids comparing it with other procedures, such as expansion and addition. Vesterager (2019) mentioned the definition of explicitation Klaudy (Klaudy, 2009, as cited in Vesterager et al., 2019) that explicitation is often known as a translation technique in which implicit information of the source text is rendered explicitly in the target text. Vesterager also mentioned that explicitation is an important feature in translation; its importance has caused many translators and researchers to analyze this procedure deeply. Unfortunately, according to Vesterager, explicitation studies offered conflicting evidence. An example of explicitation may be found in the Spanish text "El libro es interesante" whose literal translation is "The book is interesting." However, the adjective "interesante" does not specify what is interesting about the book. Fortunately, in English, it is more common to specify what aspect of the book is interesting; therefore, the translator might use explicitation: "The book is interesting because of its compelling plot." Adding an extra phrase helped to clarify the source text's implicit meaning and provided a more explicit explanation for English-speaking readers.

2.2.6 Literal Translation.

Also known as word-for-word translation, literal translation refers to translating a text by adhering closely to the words and structure of the source language without significant modifications or adaptations. It focuses on rendering the source text into the target language as literally and faithfully as possible, preserving the original word order, grammar, and lexical choices, according to

Baker (2018), who mentions what Jakobson (1959) suggests that literal translation makes impossible of the entire conceptual information a lack of grammatical device in the language translated into the original. Jakobson explained that the lack of a grammatical device can make translating "the entire conceptual information" difficult.

The literal translation is not always translating a word or structure closely of the source language; changing the expression of a cultural sentence can also applied to literal translation. Baker (2018) uses the opinion of Blum-Kulka (1986) about literal translation, expressing that English tends to use common expressions such as "Lets'" and "Shall we" in directing the actions of others, controlling talk, and making a polite request that has the force of commands. In contrast, He, brew expresses similar modal meanings addressing a question about the possibility of getting something done. Blum-Kulka explains that this is an example of literal translation as well. For better understanding, Blum-Kulka uses the sentence "Perhaps you'll go to sleep" in Hebrew as an example. Translators can easily translate word by word, but when the sentence comes from a mother to a child, the translated text will change to "go to sleep." if the translator does not know the context, it will bring an incoherent translation. Explains that this is an example of literal translation as well.

On the other hand, Newmark (1988) expresses no problem using literal translation in a text; in fact, he recommended to avoid. Newmark believes that literal translation is the basic translation procedure, and it can become difficult to avoid, "It is what one is trying to get away from, yet one sometimes comes back to

it" (p.70). Newmark reminds us not to be afraid by using literal translation in the text, particularly those target language words that look similar or the same as the source language words. However, the translator must untrust these types of words because even though the word looks like the source language word, the meaning can be different, or the word itself is different.

Literal translation can bring new translators to use this feature as the default solution for any translation text. Rasul (2019) explains that literal translation can be reversible only in certain circumstances. Rasul, in his book, explains the definition of literal translation by Vinay and Darbelnet (1995); they say that in literal translation, the translator's task is limited to observing the similitudes of the source language and target language since literal translation is just a transfer of a source language text into a grammatically and idiomatically appropriate target-language text. This emphasizes the translator's task of following the linguistic rules and conventions of the target language. Rasul highlights that this procedure is often used by those languages of the same family and common cultural values (Spanish and Portuguese). This is a correct reason to mention it because some languages could be similar grammatically and phonologically. Rasul also mentioned that new translators go for literal translation as a default translation procedure that they can trust when they find a sentence that is inappropriate for one or more reasons.

Some translator theorist positively finds literal translation and does not bother to new translators use this procedure in their translation text. Blackfish (2019) mentions in her book James Barr's (1961) opinion of literal translation, explaining that a translator making a paragraph or a simple sentence literal does not

mean that he is ignorant or chooses an inferior translation technique; in fact, this procedure enables the translators to suggest or exploit multiple meaning in the text, or at least enabled them to preserve the original meaning of the source language text. Barr and Pietersman (1979) suggest another name for a literal translation, which is "word-based translation." they explain that "word-for-word translation" highlights that the translator's primary concern was that each word be communicated and remain as transparent as possible.

While others feel fine with a literal translation, other authors negatively find it, and they recommend avoiding it at all costs. Yifeng Sun (2018), in his book, remarks what Paul de Man (1986), a Belgian-born literary critic and literary theorist, said about literal translation. Paul De Man remarks that literal translation is not always the answer, and the moment a translation is, its meaning completely disappears. Yifeng Sun shares the same opinion as Paul De Man, emphasizing that literal translation is often a bad translation. Yifeng Sun suggests to avoided through interpretation to translate more freely and creatively.

In literal translation, it is acceptable to add or remove words if the text translation is required and is still an example of literal translation. According to Arief (2020), explain the definition of literal translation as a technique that change the source language structure into the target text. Arief adds that the main point of literal translation is to be precise with the source language's form and structure. Arief also disagree to call literal translation as "word-for-word translation"; both are different since word-for-word translation focuses on keeping the target text's structure similar to the source text, ignoring any addition or reduction into the target

language. On the other hand, literal translation can eliminate or add words if necessary so they can be acceptable in the target language construction.

Changing the order or the structure of a phrase can also be considered as literal translation. According to Hartono (2020) in his book explain the definition of literal translation by Molina and Albir (2002) which is a technique that translate word-by-word or word-for-word focusing on changing a word or phrase word. Hartono clarified that literal translation is not just changing one word for another word, this could also depend on the function and meaning in the sentence, but it is often to translate word-by-word if the translator decides to use this technique. Hartono uses as an example the Spanish phrase "El equipo experimentado" translated into "The experience team", clarifying that the phrase was translated in order of the function and meaning of each word, it cannot be "team experienced" since Spanish phrase structures is different from the English phrase structure, but still consider as literal translation.

2.2.7 Punctuation changes.

It refers to the modifications or adaptations made to punctuation marks when transferring a text from the source to the target language. Punctuation serves principal functions in written language like indicating sentence boundaries, clarifying meaning, and providing emphasis. However, punctuation conventions can vary across languages, and translators need to adjust the punctuation to conform to the rules and norms of the target language.

Punctuation is an important part form translation since the translator must pay close attention to the rules and norms given by the source language and target language. Newmark (1988) try to advise translators to make a separate comparative punctuation check to the target language text and source language text. Newmark also mentions different examples of punctuation in different languages such as French, English, German, and Italian.

Not only in written text translation punctation are important, videos and television series who use subtitles are important for the spectator to read the text while watching the material easily. According to Badia (2020), punctuation is important during the subtitling process, and one needs to follow critical instructions to deliver the product without any mistakes. However, some cases remain where these rules are broken and must follow the standard guidelines. Badia found out in the subtitling version of the series The Mentalist where use a sequence dot to indicate a speech pause and to link concatenated subtitles.

The importance of punctation can easily been forgotten, especially with numbers in diverse cultures. According to Pym (2023), diverse cultures use different punctuation when numbers appear, presenting as an example how in English, the number "1,200.01" at the beginning has a coma and ends with a period. On the other hand, the same number in Spanish will change the punctation, being the period at the beginning and the coma at the end, so the number should be "1.200,01" correctly.

2.3 Glossaries.

These sections specialized a list of terms found in the documents accompanied by their word in source language, target language, definition, and grammatical category. To serve as a reference tool to help readers and the researcher understand and clarify the meaning of specific terms or concepts used within the text. For the translator's relevance, developing a glossary with all the content and definitions of the most difficult terminology of the text is important for future projects. With the purpose to provide readers with a concise and organized collection of important terms and vocabulary that may be unfamiliar or specific to the subject matter and field of study. The glossary must help readers navigate the document by offering quick access to definitions and explanations, enhancing comprehension, and reducing ambiguity.

It supports the translation process because it will provide a faster and more efficient way to search for phrases or terms and facilitating a thorough understanding of the information in the text. It is a valuable reference tool for translators, allowing them to quickly access and apply consistent translations for specific terms or expressions throughout the text.

The creation of a glossary starts with a list of the most difficult terminology that can be find out in the text. It is important for the translator to highly those difficult words during the first reading of the document that will be translated so later will be easy for the translator to look it up. Once all the most difficult words are in the list, the researcher will organize it in alphabetic order beginning with the source language, next to it, the translation of the word in the target language. For easier comprehension, next to the target language, it

will provide the dictionary definition or a brief explanation of the meaning of the word, and finally, the grammatical category of the word to understand its purpose in the text. With all this information, the glossary will serve as a valuable resource for readers, translators, and the researcher himself as a quick access to consistent translation, expediting the workflow, facilitating a thorough understanding of the text, and ensuring terminological accuracy. It is expected to use the glossary in the future as an example of professionalism and facilitate the researcher's future translations.

Chapter III

Methodological Framework

Chapter III takes deep research of theories, concepts, meanings, and ideas about the research approach, research design, information sources, analysis categories, data collection instruments, and collection data process and data analysis.

3.1 Research Approach

In order to carry out this investigation, the researcher will use the qualitative method to study the statistical analysis of the procedures and techniques. Sampieri (2018) explains the definition of the qualitative method as starting with the study of a phenomenon systematically; however, instead of starting with a theory and then confirming this theory with data and results, the researcher begins to analyze the facts themselves and check previous studies. The qualitative approach often includes language study, such as words, meanings, concepts, and opinions. Knowing what the reader or audience thinks about and why it has a determined opinion is important.

Some features of the qualitative approach start with the researcher proposing a problem but must follow the default process. Most qualitative studies do not have a hypothesis or are not necessary to prove it; instead, they are generated during the study process. Another important feature is that the qualitative approach is naturalist due to the cases being studied in their context or natural environment and customary, and there is no manipulation nor stimulation of the reality. In other words, the researcher does not interfere in the investigation. This is logical since the researcher deals with translation documents, not external factors. Lastly, the qualitative approach does not use numerical or statistics

analysis; instead, the meaning of the data, notes, diagrams, and conceptual maps are principal during a qualitative study.

The main advantage of qualitative data is the support to understand the motivations of its audience's actions. It is possible to explain why, what, and how qualitative data are explained, helping them with problem solutions and creating new ideas for the investigation.

3.2 Research Design

The descriptive design is a scientific method of investigation that implies watching and describing the manner of the subject without disturbing them. The descriptive design aims to describe and present an accurate representation of a particular phenomenon or situation. It involves systematically observing, documenting, and analyzing the characteristics, behaviors, or patterns of the subject of study. This research project aims to translate and is necessary to investigate various aspects of translation procedures, methods, and outcomes. It helps researchers gain insights into the nature of translation and contributes to understanding and improving translation practice. When using a descriptive design in translation research, it is important to ensure that the research methods and data collection techniques are appropriate for the researcher's objectives. The researcher must carefully plan and elaborate documents to apply observations, establish clear research questions, and employ suitable data analysis techniques to draw meaningful conclusions.

3.3 Information Sources

For this investigation project, the researcher employs a range of information sources to gather relevant data and support his analysis. These sources encompass primary, secondary, and tertiary sources, each serving a specific purpose in the research process.

Primary sources are crucial in providing direct evidence or firsthand accounts of the event, topic, or research subject under investigation. In the context of this project, the researcher identifies translation books as primary sources. These books contain valuable information about various methods and procedures used in the translation process, offering insights and firsthand experiences from experts in the field. The researcher relies on these primary sources to gather foundational knowledge and gain a comprehensive understanding of the different approaches to translation.

Secondary sources, on the other hand, provide information from perspectives that did not directly experience or witness the event or subject being studied. They offer alternative viewpoints, analyses, or interpretations of the primary sources and contribute to a broader understanding of the research topic. In this project, the researcher consults different journals as secondary sources. These journals provide scholarly articles and research papers that explore various aspects of translation, such as theoretical frameworks, case studies, or critical analyses. The researcher utilizes these secondary sources to enrich their understanding, consider different viewpoints, and incorporate existing research into their investigation.

Tertiary sources serve as compilations or summaries of information from primary and secondary sources, making them convenient for quick reference or obtaining specific information. The researcher identifies dictionaries, particularly the Cambridge Dictionary,

as tertiary sources in this project. These dictionaries offer concise definitions, explanations, and examples of translation terms, concepts, or terminology. The researcher utilizes these tertiary sources to ensure accurate usage of terminology, verify definitions, and maintain consistency in their project.

3.4 Analysis Categories

The analysis categories refer to the ability of the researcher to delve into the world of translation. The researcher must know and understand what is behind the study of translation before working on an immersive project. Due to this investigation's aim through a qualitative approach, the researcher must use analysis categories to proceed in this investigation. The first concept to consider is the meaning of translation, which refers to the process of conveying the meaning of a text from one language to another. It involves transferring linguistic, cultural, and contextual elements to ensure effective language communication and understanding. Understanding the concept of translation is fundamental for analyzing the data in this investigation, as it serves as the central focus of the research.

Another concept to consider is methods, which refer to the particular approaches, techniques, or strategies employed to conduct the research and gather data. In this qualitative investigation, the researcher may adopt various methods like text analysis to explore the phenomenon of translation and its associated aspects. The choice of methods will depend on the specific research question, objectives, and the nature of the data being investigated.

Additionally, procedure refers to actions or steps considered the official or accepted way of doing something. In translation research, the procedure can refer to the systematic process followed by translators to approach and carry out translation tasks. The researcher

may analyze the procedures translators employ, their decision-making processes, or the steps involved in translation projects to gain insights into translation practice.

By considering these concepts of translation, methods, and procedure, the researcher can develop appropriate analysis categories to guide the qualitative investigation. These analysis categories will enable the researcher to delve into the complexities of translation, explore the experiences and perspectives of translators, and gain a comprehensive understanding of the phenomenon under investigation.

3.5 Data Collection Instruments

The tools employed in this translation project play an important role in addressing the research questions and facilitating the successful completion of the translation process. The first instrument is an analysis of the text with a chart. When embarking on a translation project, it is important to read the ST several times to consider all the main elements the translator must know before starting the translation. Both STs of this translation project are complete with a formal formality scale. The source texts are informative documents used in the agricultural field, which could deal with a scale of generality that includes information, technical, or even opaquely technical difficult level. In order to showcase the text analysis, the researcher will create a three-column chart; the first column will have the text analysis criteria. The second column will have characteristics of the English-Spanish translation, and the second column will have characteristics of the Spanish-English translation. The following chart represents how is going to be used in the analysis:

Text Analysis Element	The Avocado Industry in Israel	Política Pública del Sector Agropecuario Costarricense 2023-2032
Text Style		
Text Function		

Type of Translation		
Scale of Formality		
The scale of Emotional Tone		
Scale of Generality		

Table 1. Text analysis of the translated document

Furthermore, a colored-coded chart will be added as part of the instruments. The color-coding chart will be used to deeply analyze the procedures applied to the ST to render the translation. Each translation procedure will be assigned a color to highlight the procedure within the text, allowing a better understanding of the specific contextual situations. The color-coding chart will be used in Chapter V; however, the following chart shows how the procedures will be categorized and analyzed:

Procedure	Example	Explanation
Transposition	Transposition	Highlighted in yellow
Modulation	Modulation	Highlighted in blue
Omission	Omission	Underlined in the ST
Amplification	Amplification	Highlighted in red
Explicitation	Explicitation	Highlighted in pink
Literal Translation	Literal Translation	Green font
Punctuation Changes.	Punctuation Changes	Red font

Table 2. Color-coding of the procedures

Lastly, the creation of a glossary is vital for this project. It will contain words that are unfamiliar to the researcher, difficult words to translate, and terminology. Some words are related to agricultural terminology and are explained in the glossary. There will be two

main glossaries, one for each language. The design of both glossaries will consist of a four-column table with a row of the term in one language, a row in the other language, the grammatical category, and its definition. Here is an example of the table:

English Term	Spanish Term	Grammatical Category	Definition

Table 3. Glossary of the most relevant terms

3.6 Collection data process and data analysis

This work will begin after the initial reading of the text. Analyzing the reading as deeply as possible is important to understand the topic and concepts and be sure of unknown terms. To make it more accurate, the researcher scans the reading twice to understand the context better. The next step is contacting the original authors of both works to hash out details, ask questions about the procedure, and map a plan to accomplish the work. Therefore, the researcher will expand and apply his knowledge base to the work. This includes readings and studies of a similar topic and allows the researcher to determine important aspects of the work.

Once the initial reading is done, translating both texts is time. There will be several revisions and corrections to ensure good quality in the translation when it has been done. Eventually, the researcher will choose several paragraphs of the ST and TT to analyze and compare its procedures with the color-coded chart. In addition, most of the complicated words found in the text will be added to the glossary in their respective place within the table mentioned above. Then, a chapter dedicated to conclusions and recommendations will be added. Once all the findings are done, they will be showcased, explained, and explored, concluding the investigation process.

The final step is delivering the translation to their original authors. Once the investigation is completed, the researcher will reach out to those who trust the researcher to make a quality

translation. Finalizing this important work for future readers who want to expand their knowledge.

Chapter IV

Translation

1.3 Translation from Spanish to English: Política Pública del Sector Agropecuario Costarricense 2023-2032

Public Policy for the Costa Rican Agriculture Sector 2023-2032

You can visualize this document in the following websites:

www.mag.go.cr / www.sepsa.go.cr

January 2023

ACRONYMS LIST

AF	Family Farming
IDB	Inter-American Development Bank
CAN	National Agricultural Council
IPPC	International Plant Protection Convention
CORBANA	National Banana Corporation
CORFOGA	Livestock Development Corporation
CONARROZ	National Rise Corporation
COTECSA	Agricultural Sector Technical
Committee COSEL	Local Sectoral Committee
CSRA	Regional Agricultural Sector Committees
STI	Science, Technology, and Innovation
CTP	Professional Technical Colleges
DNEA	National Directorate of Agricultural Extension
ECADERT	Central American Strategy for Territorial Development: 2010-2030
EASAC	Strategy on Sustainable Development Adapted to Climate Change for the SICA Region 2018-2030
EPYPSA	Studies, Projects and Planification S.A.

FODEA	Law for the Promotion of Agricultural Production
FONAFIFO	National Forestry Financing Fund
MfDR	Managing for Development Results
ICAFE	Costa Rica Coffee Institute
INA	National Learning Institute
INTA	National Institute for Innovation and Transfer of Agricultural Technology
LAICA	Agricultural Industrial League of Sugarcane
MAG	Ministry of Agriculture and Livestock
NAMA	Nationally Appropriate Mitigation Actions
OECD	Organization for Economic Co-operation and Development
SDGs	Sustainable Development Goals
OIE	World Organization for Animal Health
WTO	World Trade Organization
PAI	Institutional Supply Programme
PEDRT	Policy for State Development in Rural Areas
PEN	National Strategic Plan
PNDIP	National Development and Public Investment Plan
SEPSA	Executive Secretariat for Agricultural Sectoral Planning
ICT	Information and Communication Technology

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PRESENTATION

The Costa Rican agricultural sector is currently facing a critical situation and it requires an inter-institutional effort under the leadership of the Ministry of Agriculture and Livestock (MAG) to rescue the national productive sector.

The current state situation, from a sectoral perspective, is complex. The multitude of institutions involved with duplicated functions and excessive administrative structures lead to the underfunding of their core areas. Furthermore, the distraction of these institutions results in overlapping competencies, which in turn cause deficiencies.

Achieving competitiveness in crops that may not inherently have a comparative advantage requires efficient research, a favorable business environment, and decision-making based on science and technology. In our case, we must work on mechanisms to capture information that allows for informed decision-making to promote competitiveness in both domestic and international markets.

For many years, the Ministry and Sector institutions have reduced their presence in the field, leading to a reduction in technical assistance, research, and knowledge transfer. This has had significant impacts on those who benefited from these services, the producers.

Today, we are starting a radical change and more human resources to enhance the areas with the greatest impact on producers. Along with the aforementioned actions, we must promote crops that can be processed in the country, exported, or sold locally already transformed, seeking to benefit rural areas through chaining and adding value to generate wealth creation.

With the actual policy, we hope to implement a series of concrete actions that have already been identified, aimed at reactivating an economic sector that is not just important but indispensable for rural development. We will leverage technological tools and create more Jobs, both skilled and unskilled, to restore the economic appeal of investing in the national Agricultural Sector.

Víctor Julio Carvajal Porras

Ministry

1. INTRODUCTION

The challenges faced by our country's agricultural sector are significant and requires coordinated state action to address them. That is why this policy aims to direct the actions of Costa Rica's public sector institutions that are part of the Agricultural sector. By acting together, a series of common objectives and goals Will be achieved to drive the sector and improve the creation of public value.

This document starts with an analysis of the situation in both productive and institutional aspects of the sector, identifying the main challenges and issues to be addressed. These Will be tackled through strategic axes, each with its respective lines of action over the next 10 years.

The development of the Sectoral Plan to operate the policy, it will be led by the leadership with the support of the Executive Secretariat for Agricultural Sectoral Planning (SEPSA) This plan Will define the interventions, responsible parties, deadlines, monitoring indicators, and budgets for each of the strategic axes.

This policy aims to ensure that the institutions that are part of the Agricultural Sector answer to the current needs of the productive sector. The ultimate goa is for these institutions to fulfill their mission more effectively and have a greater impact on well-being and development.

The desired outcome is more productive, competitive, and sustainable sector that generates increasing economic and social benefits each day.

2. METHODOLOGICAL FRAMEWORK

The development of this policy included the participation of institutions within the Agricultural Sector, the academy, and the productive sector. This process was led by SEPSA, which also received technical cooperation support from the Inter-American Development Bank (IDB). Through a participatory process, this effort resulted in the "Strategic Design of the Public Policy for the Agricultural, Fisheries, and Rural Sector," a document used as input for the creation of the Public Policy for the Costa Rican Agricultural Sector 2023-2032.

Initially, the identification and analysis of the problems and challenges in the sector were conducted. This was done to gather essential information to consider in the policy formulation process. This characterization was used to identify the stakeholders in the sector and the various public interventions. Simultaneously, interviews were conducted with key stakeholders, including both institutional and private sector representatives, providing valuable input for the design of public policy.

With these inputs, an initial synthesis document was prepared and subjected to consultation with the identified stakeholders through an online questionnaire. The aim was to gather feedback and strengthen the policy-building process.

Being the policy as the framework for coordinating and planning actions within the Agricultural Sectors, and considering the results obtained from the aforementioned processes, we then proceeded to construct the strategic vision and mission for the sector. This involved defining principles, proposed strategic axes, and lines of action, which were subsequently validated b focus groups.

This first stage concluded with the presentation before the National Agricultural Council (CAN) in April 2022. The proposal was received and contributed as the main input for the definition of a new sectoral policy.

After a series of working sessions with sector authorities and the Minister in charge, the vision, priorities, strategic guidelines, axes, lines, and actions were redefined. This resulted in the foundational document for the Public Policy for the Costa Rican Agricultural Sector 2023-2032.

This document was subject to feedback through consultation with various stakeholders to account for the economic dynamics, rapid, growing, and disruptive technological transformation, demographic and socio-territorial changes, new trends in consumer tastes and preferences, challenges and anticipated consequences of climate change, and the transformation of public institutions. All of this is aimed at enhancing the competitiveness of the Agricultural Sector.

3. NORMATIVE FRAMEWORK

The MAG, as the governing body of the Agricultural Sector, as stablished in Law 7064, "Law for the Promotion of Agricultural Production (FODEA) and the Organic Law of MAG," is responsible for defining and leading the public policy for the agricultural sector.

On the international stage, over the past three decades, Costa Rica has undertaken multilateral commitments and entered into trade agreements that the county must honor. Some of the most relevant commitments include accession to the following international organizations: the World Trade Organization (WTO), the Organization for Economic Co-operation and Development (OECD), the International Plant Protection Convention (IPPC), the World Organization for Animal Health (OIE), as well as the signing of the United Nations Framework Convention on Climate Change, the Code of Conduct Responsible Fisheries, and the Sustainable Development Goals (SDGs). This Policy has a narrow relation with the SDGs, contributing with its compliance as contribution of the Agricultural Sector Another commitment the country has is related to the Montevideo Consensus on Population and Development, particularly in the Public Policy for the Costa Rican Agricultural Sector 2023-2032 within its Productivity and Sustainability axis, actions are linked with Measure A of the consensus. This measure focuses on the full integration of the population and its dynamics into sustainable development with equality and respect for human rights. Specifically, the following agreements are relevant: 5) To pursue sustainable development as a means to ensure human well-being equitably shared by all peoples today and in the future, guaranteeing that the interrelationships between population, resources, the environment, and development are fully recognized, suitably managed, and established in a harmonious and Dynamic balance with biodiversity health and ecosystems. 6) To ensure a pattern of sustainable production and consumption and to avoid the exacerbation of undesirable climate changes caused by human activities.

Likewise, there are several commitments at the Central American regional level within the framework of the Central American Integration System (SICA), such as the Central American Strategy for Territorial Development 2010-2030 (ECADERT), the Agricultural Policy of the SICA Region 2019-2030, the Strategy on Sustainable Development Adapted to Climate Change for the SICA Region 2018-2030 (EASAC), These instruments share a common goal: the development of rural communities, sustainable agriculture, and a competitive and integrated sector involving both public and private stakeholders.

Regarding national regulations, the Agricultural Sector was established under the Title II of Law No. 7064, the Agricultural Production Promotion and Organic Law of the MAG, issued on April 29, 1987; known as the FODEA law, along with its amendments and other related laws.

Such normative defines the sectoral coordination mechanisms, as stipulated by Law No. 7064, including the CAN led by the MAG as the sector's leader, and comprising the heads of the eleven institutions within the sector.

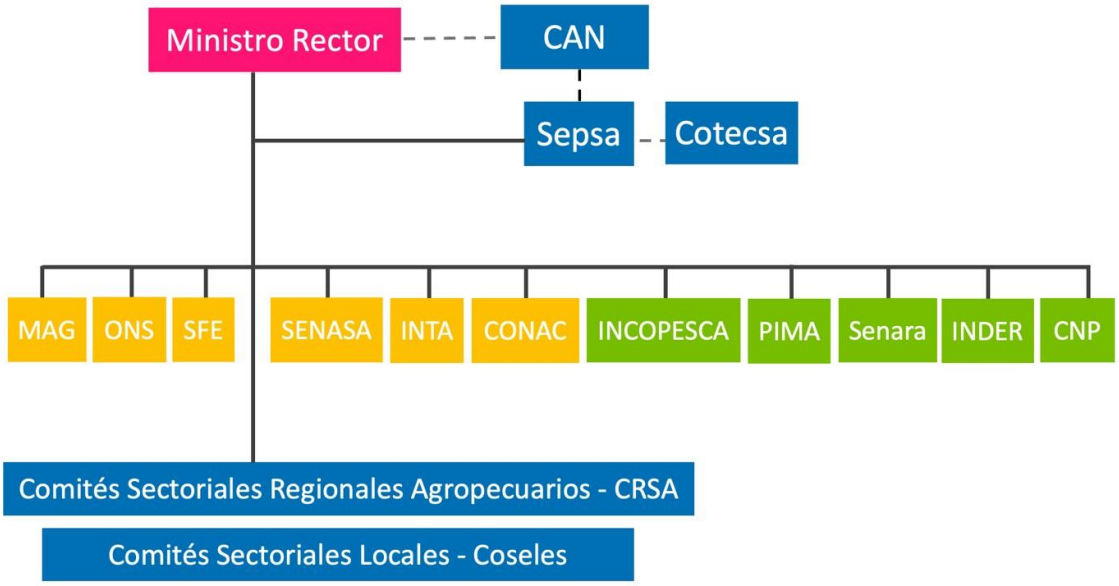
Additionally, there is the Agricultural Sector Technical Committee (COTECSA), a technical body consisting of the Planning Directors of sector institutions. COTECSA, in coordination with SEPSA, translates the directives issued by CAN into action.

It is also important to mention corporations, specialized entities, and non-state public entities that oversee the development of productive activities.

FIGURE 1

AGRICULTURAL
SECTOR

MECHANISM OF NATIONAL, REGIONAL AND LOCAL SECTORAL
COORDINATION



Source: SEPSA, self-elaboration, 2022.It is appropriate to consider Decree 43580-MP-PLAN "Organic Regulation of the Executive Branch," from June 2022, in which the Chaves Robles Administration defined the sectoral structure with the following institutional composition:

1. The MAG and its decentralized bodies: National Council of 4-S Clubs (CONAC), National Institute for Innovation and Transfer of Agricultural Technology (INTA), State Phytosanitary Service (SFE) National Animal Health Service (SENASA)
2. The National Production Council (CNP)
3. The Costa Rican Institute of Fisheries and Aquaculture (INCOPESCA)
4. Institute of Rural Development (INDER)
5. The Comprehensive Agricultural Marketing Program (PIMA)
6. The National Irrigation and Drainage Service (SENARA)
7. The National Seed Office (ONS)
8. The National Rise Corporation (CONARROZ)
9. The National Banana Corporation (CORBANA)
10. The Livestock Development Corporation (CORFOGA)

11. The National Horticulture Corporation
12. The Costa Rica Coffee Institute (ICAFE)
13. The Agricultural Industrial League of Sugarcane (LAICA)
14. The National Forestry Office, understanding its participation will be associated to the forest production
15. National Coffee Stabilization Fund (FONECAFE)
16. National Coffee Sustainable Fund (FONASCAFE)

Furthermore, there are other previously developed policy instruments with which the Policy should be aligned.

The Policy for State Development in Rural Areas (PEDRT) 2015-2030, Whose general objective is: To promote inclusive development in rural territories, recognizing and respecting their own Characteristics and the cultural identity of their population, through a system of public-private coordination that reduces economic, social, cultural, environmental, and political-institutional inequalities and inequities by developing capacities and opportunities for their inhabitants.

The National Seed Policy 2017-2030, with the objective of: Promoting the development of the Costa Rican seed sector with a focus on coordinating the interests and resources of its members to improve the productive efficiency of the agricultural sector in response to the challenges posed by food and nutritional security, biodiversity preservation, climate change, globalization of markets, and the quality assurance of seeds.

The Gender Equality Policy for Inclusive Development in the Costa Rican Agricultural, Fishing, and Rural Sector 2020-2030 and its action plan, with the objective of: Significantly reducing gender inequalities in the development of productive activities by providing effective and equal attention through institutional services in the sector, its territorial and regional context.

Additionally, it must align with the long-term strategic framework for the country outlined in the following instruments:

- National Strategic Plan–PEN 2050.
- National Decarbonization Plan 2018- 2050.
- Territorial Economic Strategy for an Inclusive and Decarbonized economy 2020-2050.
- National Development and Public Investment Plan–PNDIP 2023-2026.

This national and international normative framework establishes the scope of the policy measures that can be implemented to drive the sector, in line with national regulations and without violating international commitments.

4. SITUTATION STATE OF THE AGRICULTURAL AREA

The Agricultural sector is of great economic and social relevance, as reflected in its contribution to the Gross Domestic Product (GDP), exports (a source of foreign Exchange), employment, improved socio-economic conditions in rural areas, food production, among others.

This sector is characterized by the coexistence of micro, small, medium-sized producers, including a significant number of units falling under the category of Family Farming (AF). Additionally, there are large producers oriented towards international markets.

This Sector represents significant asymmetries between agro-exporters and producers for the local market. This, coupled with agricultural inputs that do not keep up with moder technologies, and significant market concentration.

According to data from the Central Bank of Costa Rica, the expanded agriculture's share of the GDP was 9.6% in 2021. Out of this percentage, 4.5% corresponds to the primary sector, and 5.1% to agro-industry. Concerning the added value in the agricultural sector, 69% is from agricultural activities, 21% from livestock, and the remaining 10% comprises support activities (6%), forestry and timber extraction (3%), and fishing and aquaculture (1%).

In terms of international trade, the agricultural sector in Costa Rica maintains a trade surplus. In 2021, the country registered exports amounting to USD 5,610.9 million and imports of USD 2.454 billion. Of the total exports, 39.1% are related to the agricultural sector. This includes agricultural products (21.3%), the food industry (14.0%), livestock and fisheries (2.7%), and other agricultural-related products (1.1%).

The agricultural sector ranks second in terms of job creation, providing employment for around 238,227 people, which constitutes 11.7% of the total employed population. Out of this workforce, 87.7% are male, and 12.3% are female.

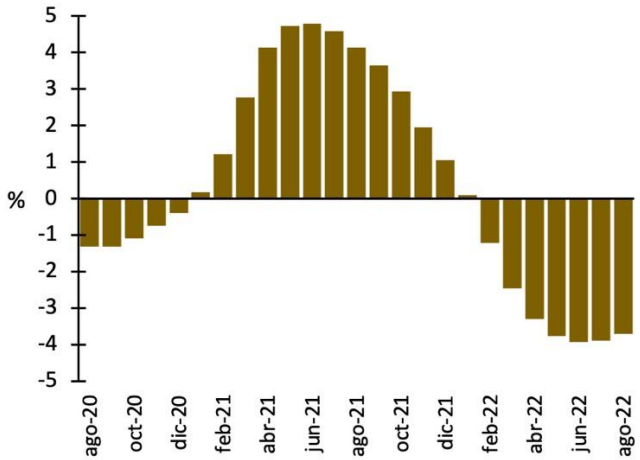
However, the Monthly Index of Economic Activity of the agricultural sector (IMAGRO) displayed negative year-on-year variations in 2020 and experienced a slowdown starting in April 2021. It eventually reached negative values from February 2022 onwards, a trend also observed in exportable products, support services, livestock, and agricultural activities.

FIGURE 2

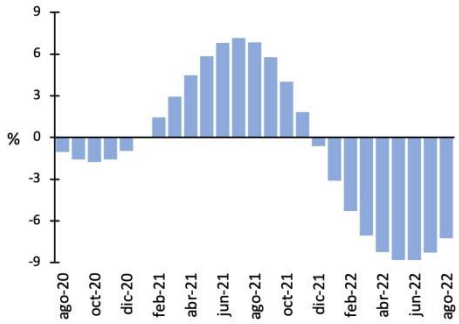
GENERAL IMAGRO YEAR-ON-YEAR VARIATION AND THE TYPES OF AGRICULTURAL ACTIVITY

PERIOD: AUGUST 2020 – AUGUST 2022

General

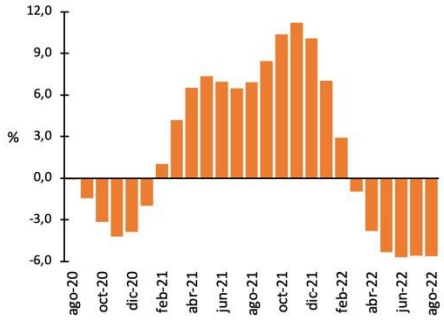


Productos exportables



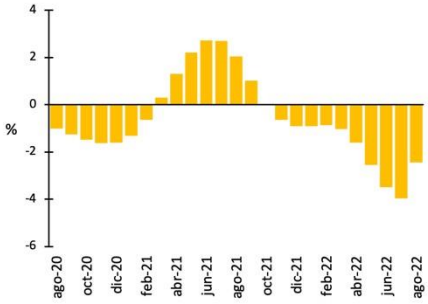
Incluye: piña, banano, melón, sandía, flores, follajes y

Productos agrícolas



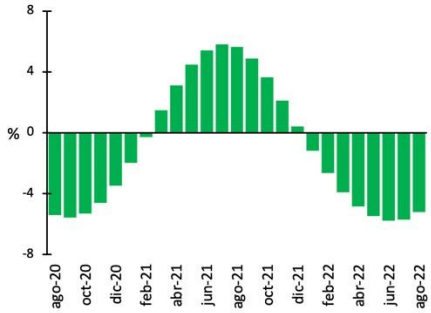
Incluye: granos básicos, cereales, legumbres y otra semillas oleaginosas, hortalizas, raíces y tubérculos, caña, café y frutales

Productos pecuarios



Incluye: bovino, porcino, pollo, otros animales vivos, huevos, leche y otros productos animales

Resto de productos



Incluye: Servicios de apoyo a la agricultura, la ganadería, y actividades postcosecha, pesca marítima y acuicultura

Source: SEPSA elaboration with data of the BCCR, IMAGRO, 2022.The above information underscores the urgent need to reactivate the primary sector because it undeniably impacts the socio-economic development of the country, especially in rural areas.

On the other hand, the average age of the employed population in the sector has increased in recent years. In addition, a portion of the younger population, especially those with higher educational levels, is relocating to urban areas in search of job opportunities in other sectors.

It is important to mention the role of foreign migrant workers in meeting the labor needs of the agricultural sector, particularly during the harvest seasons of certain nationally important crops.

Regarding poverty, rural areas face higher poverty rates. For instance, in 2021, the poverty rate reached 26.3% in rural areas, while it was 21.8% in urban areas. The rate of extreme poverty was estimated at 5.5% in urban areas and 8.3% in rural areas.

Income inequality in the total population, measured by the Gini coefficient over the past decade, has shown values ranging between 0.524 and 0,515. Nevertheless, in the agricultural sector, individuals with independent activities have higher Gini coefficient values (fluctuating between 0,575 and 0,618 for the years 2015 to 2019) compared to salaried workers (between 0,414 to 0,447)[1].

Regarding inclusion, women in the agricultural sector face fewer opportunities than men when it comes to formal employment, Access to assets, technical assistance, financing, and other conditions. Additionally, they have limited Access to land for production, further reducing their chances of escaping poverty[2].

Furthermore, Costa Rica has a marine territory that is 11 times the size of its land territory. However, the economic weight of the fishing and aquaculture subsector is minimal (less than 0.1% of the GDP). While fishing-related activities are important for coastal communities, they have not become a driver of development or an avenue for creating alternative sources of income through values chains.

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[1] The result of this coefficient should be interpreted as a value between 0 and 1, where 0 represents perfect equality (meaning everyone has the same income) and 1 represents perfect inequality (where one person concentrates all the income, and others have none). SEPSA, 2019. Gini coefficient in the Agricultural Sector 2010-2019

[2] Policy for Gender Equality for Inclusive Development in the Costa Rican Agricultural, Fishing, and Rural Sector 2020-2030 and I Action Plan.

5. POPULATION TARGET

The Public Policy for the Costa Rican Agricultural Sector 2023-2032 defines the target population as natural or legal persons engaged in agricultural, livestock, fishing, aquaculture, and/or agro-industrial activities in the Costa Rican Territory.

6. MAIN AREA CHALLENGES

After the economic crisis in the 80's, the country started changes in its development model, characterized by expanding the integration of the Costa Rican economy into the international market. This was achieved through the promotion and diversification of exports, as well as the attraction of foreign direct investment.

However, despite the benefits of this model of trade openness, the economic system has created a productive duality. On one hand, there is a dynamic sector linked to global value chains, and on the other, a production structure dedicated to the domestic market with limited linkages and dispersion of the institutions responsible for its promotion. Additionally, support programs have been reduced due to fiscal deficit control measures.

According of the above information, the Agricultural Sector requires a Public Policy that takes into account the challenges it faces and the new demands posed by the environment. This policy aims to generate solutions with existing resources to achieve the goals outlined in this policy.

6.1 INCREASING IN COMPETITIVENESS AND PRODUCTIVITY

From an economic point of view, the main agricultural activities, whether oriented towards domestic or international markets, face significant challenges related to improving their productivity and competitiveness in the face of increasingly demanding markets. They need to adapt their production and processing techniques to new technologies.

It is necessary to identify and capitalize on market niches at both the national and international levels to enhance the positioning of traditional products and introduce new products in emerging markets. This can also create synergies that expand the benefits to rural areas.

The diversification of the supply and increasing its productivity and competitiveness also serves a social purpose: ensuring the availability of goods and services in the markets and thereby contributing to adequate food and nutrition for the population.

The public sector plays an important role in increasing productivity though research into new technological offerings, resilient varieties, precision agriculture, and extension services that allow the producer to be competitive by increasing their productivity.

Other key aspects for generating increased productivity include: the availability of information for decision-making, infrastructure, data management, and access to financing, among others.

6.2 EFFICIENT INSTITUTIONAL RESPONSE TO NECESITIES OF THE PRODUCERS

The institutions in the Agricultural Sector have not been able to respond with the necessary speed to the changes in agricultural activities due to technological advances, and they have not been able to react promptly to assist producers in light of trade liberalization measures approved years ago. This has mainly affected producers due to:

I. A limited public investment that is incapable of generating sufficient impact for the Sector's development.
II. Inadequate training of officials, preventing them from effectively serving the needs of producers.
III. An ineffective generational turnover within the public institutions.

A lack of harmony or effective coordination among sector institutions, leading to duplicated processes and the allocation of resources without clear objective-based planning.

6.3 SUSTAINABLE PRODUCTION AND CLIMATE CHANGE ADAPTATION

The market has evolved, as it now requires not only high-quality products but also demands sustainable production, free from deforestation, organic products, and products with low chemical inputs. In addition, modifications in production systems are required to incorporate measures for mitigating and adapting to climate change.

Transactions in international markets will prioritize goods produced under sustainable management systems over tariff barriers. Therefore, the institutions within the agricultural sector must be prepared for these developments and ensure that no producers are left behind.

6.4 TO STRESS IN THE QUALITY IMPROVEMENT IN RURAL AREAS

The Agricultural Sector is often the driving forces behind rural economies, as its growth or decline has immediate repercussions in these areas. As mentioned earlier, 26.3% of the rural population lives in poverty. Therefore, the sector must become an effective channel for reducing this condition by promoting an active process of social inclusion that involves the entire rural population, enabling them to improve their conditions and opportunities.

6.5 STIMULUS OF AN EFFICIENT COMMERCIALIZATION

The Agricultural Sector faces the challenge of promoting a closer and more efficient relationship between the productive sector and consumers. This proximity would lead to better prices for both producers and consumers, encourage quality, value addition, and product differentiation. This also involves developing new ways to market products, such as auctions, local markets, e-commerce, and more.

6.6 AGROPRODUCTIVE TECHNOLOGY

With the advancement of technological changes, the Agricultural Sector at the international level has been incorporating technology into production systems, increasing productivity, and reducing production costs.

The interaction between informatics[3] and biology, especially genetic improvement tools and biotechnologies, opens up significant opportunities for producers to actively engage in the use and application of these new technologies.

6.7 DEMOGRAPHIC CHANGES

The country is experiencing a demographic shift characterized by a gradual decrease in the rural population. While the total population has been growing at a cumulative annual rate of 1.4% in recent decades, the rural population has been declining at a rate of 1.3% in the agricultural sector, there is a noticeable increase in the average age of the occupied population, largely due to a significant Flow of Young people from rural areas who are not finding attractive opportunities in the sector. The sector's inability to retain a young population is crucial for its development because it is precisely these young individuals who have greater education and potential skills to incorporate new technologies and become agents of change to modernize and diversify rural production.

[3] This includes microelectronics, data management, artificial intelligence, remote sensing, etc.

7. APPROACHES AND PRINCIPLES

In this section, It discussed the main approaches and principles currently on the Public Policy for the Costa Rican Agricultural Sector 2023-2032.

7.1 APPROACHES

- *Sustainable development:* The original definition by the World Commission on Environment and Development[4] states, *"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."* This concept recognizes that such development encompasses three dimensions: economic, environmental, and social.

- *Human Rights:* A conceptual framework that guides the promotion of human development processes and is based on international standards.
- *Inclusive Right:* This approach places special emphasis on a development vision that does not exclude but, on the contrary, integrates and involves all social stakeholders. This approach applies a strategy that places social development at its core, reduces inequality gaps, and contributes to the reduction of structural vulnerabilities.

- *Results-Based Management in Development:* A direction for collective and coherent action through which public development managers promote the creation of greater public value, aiming to ensure the effectiveness of public goods and services that translate into population satisfaction. This approach establishes responsibilities for achieving results, promotes more effective, timely, and accurate accountability, and allows for verification by the public and citizens.

[4] Report by Brundtland, 1987.

7.2 GUIDING PRINCIPLES

These guiding principles are:

- *Multidimensional Sustainability:* The Agricultural Sector Will direct its efforts toward the efficient use and utilization of resources, ensuring the satisfaction of the needs of producers without compromising the options for future generations and guaranteeing a better position in the markets.

- *Comprehensiveness:* The development of the Agricultural Sector Will require processes of coordination and complementarity of public interventions to be carried out, taking into account the different sectors of the economy at the national, regional, territorial, and local levels.

- *Solidarity:* Based on mutual assistance among the various stakeholders that make up the Agricultural Sector, allowing for a dignified life for all individuals.

- *Inclusion:* Incorporating individuals and social groups without distinction of any kind into the resources and services provided by the Agricultural Sector.

- *Social Responsibility:* Acting for the Benefit of current and future society by providing timely and effective public goods and services.

- *Transparency and Accountability:* Monitoring and evaluating the actions implemented in compliance with the established public interventions in an atmosphere of dialogue and coordination between public institutions and the private sector.

8. MISSION, VISION AND OBJETIVES

8.1 VISION

Being 2032 to become a competitive, productive, linked, technical, inclusive, and sustainable sector that fulfills the role of driving the economy and generating economic, social, and environmental opportunities, and benefits.

8.2 MISSION

To increase the competitiveness of the sector through actions aimed at productivity, sustainability (economic, social, and environmental), and resilience and adaptation to climate change, promoting greater integration of national production into markets, job creation, thus contributing to improving the living conditions of the population.

8.3 GENERAL OBJECTIVE

Enhance economic, social, and environmental sustainability by implementing tolos and mechanisms, that contribute to the development and well-being of the population associated with the Costa Rican Agricultural Sector.

8.4 SPECIFIC OBJETIVES

- Support the agricultural production sector through the modernization of public institutions to address the needs of producers promptly.
- Create ideal conditions to improve the competitiveness of agricultural producers.
- Contribute to increased productivity and sustainability in agricultural production through efficient mechanisms that enable producers to meet market challenges.
- Enhance economic development through value addition, technology, and competitive advantages in agricultural and fishing production for the well-being on the rural population.

9. AXIS, STRATEGIC LINES AND ACTIONS

The Agricultural Sector Policy consists of strategic axes that address the identified challenges. Each axis is composed of lines and actions. The table below shows the challenges and the corresponding axes:

TABLE 1

VINCULATION OF THE POLICY FOR THE COSTA RICAN AGRICULTURAL SECTOR 2023-2032 WITH THE SDGs AND SECTOR CHALLENGES

AXIS	Contribute to	CHALLENGES
1.MODERNIZATION OF AGRICULTURAL	SDGs2	Efficient institutional response to necessities for producers.
2. COMPETITIVENESS	SDGs2 SDGs6	Increasing of competitiveness
3. PRODUCTIVITY AND SUSTAINABILITY	SDGs2 SDGs6 SDGs8 SDGs12	Increasing of competitiveness and productivity Sustainable production and climate change Agroproductive technology Demographic changes.
4. VALUE ADDED AND COMERCIALIZATION	SDGs2 SDGs5 SDGs8	To stress in the quality improvement In rural areas

Source: SEPSA, self-elaboration, 2022.

9.1 AXIS 1. MODERNIZATION OF AGRICULTURAL INSTITUTIONS SECTOR

The Agricultural Sector is comprised of a broad and complex public institutional structure, where institutions, according to their competencies, carry out actions to support producers, from primary production to marketing. It also has various mechanisms for planning and coordination among its institutions. Despite the existence of these bodies, coordination of institutional actions has been weak and insufficient in recent years.

Exercising clear leadership in the fulfillment of the Agricultural Sector's objectives guides the capabilities of the involved institutions, promoting coordination and institutional cooperation, resulting in a greater impact in public management and satisfaction for the producer.

The Agricultural Sector requires an efficient, effective, modern, and technologically advanced institutional framework. This includes strengthening governance and improving decision-making processes to guide and drive economic and social development in the sector.

Objective: Support the agricultural production sector through the modernization of public institutions to provide timely assistance to producers' needs

9.1.1 Strategic Line: Modernization and strengthening of the institutionality from the Agricultural Sector

The normative framework of the Agricultural Sector is based on Law No.7064, known as FODEA law, and the MAG, and its amendments. Currently, this legislation has limitations for coordination, alignment, effective and efficient direction of the institutions that make up the sector. Therefore, an adjustment is needed to create a favorable environment for the implementation of the strategies and actions that must be promoted, as well as strengthening the organization, management, and decision-making processes-**Proposed actions:**

- Reform of the regulatory framework to improve the governance of the sector and address socio-economic and environmental development goals.
- Updating the functions and institutional structures of the sector to respond to the changing environmental conditions.
- Strengthening inter-institutional coordination to increase the level of efficiency and effectiveness in public administration by ensuring the proper use of public resources.
- Updating regulations that impact the sector's competitiveness.
- Monitoring production support projects to ensure their impact on management and execution.
- Evaluating the quality of services provided by institutions with public interventions.
- Implementing technological tools aimed at simplifying procedures and improving regulation.
- Reallocating budgets to enhance areas with the greatest impact on the producers.

9.1.2 Strategic Line: Strengthening of human resource from public institutions of Agricultural Sector

This line aims to enhance the competencies and skills, both technical and soft, of the staff in the sector's institutions in order to respond to the institutional, competency, and functional model that is defined, as well as the needs of the productive sector. Therefore, it is necessary to strengthen the capacities in prospecting, planning, monitoring, and evaluating various public interventions in the sector.

As a consequence, it is necessary to reinforce institutional capacities to move towards comprehensive and coordinated approaches that strategically guide efforts in the sector and its ability to engage the private sector and other stakeholders in its development.

Proposed actions:

- Identification of the technical and soft skills needs of the staff in the institutions of the Agricultural Sector that need to be strengthened or developed.
- Strengthening of the technical and soft skills, and specialization of the staff in the institutions of the Agricultural Sector in response to the needs of the productive sector, as identified in the previous diagnosis.

9.1.3 Strategic Line: Cross-selectoral coordination

In the current environment, strengthening coordination between the Agricultural Sector and other sectors of the institutional framework and society increases the chances of successfully managing public policies aimed at producers. This is because institutions outside the Agricultural Sector also have competencies, capabilities, and resources to support public interventions.

Proposed actions:

- Bonding and implementation of commitments and actions defined for the Agricultural Sector in various cross-sectoral interventions (policies, plans, programs, etc.).
- Coordination between the public, private, and academic sectors to generate products and services in line with the needs of the Agricultural Sector.
- Simplification of procedures in the services offered by public institutions to reduce costs for producers to reduce costs for producers.
- Promotion of the formalization of producers

Considering the realities and peculiarities of the Agricultural Sector.

- Interagency coordination to address market distortions created by unfair or anticompetitive practices in domestic and international trade.

9.2 AXIS 2. COMPIETITIVENESS ENCOURAGEMENT

This intervention line aims to promote improvements in the availability of information for all productive agents and decision-makers. This coupled with the provision of efficient and effective institutional services that directly impact competitiveness, as well as Access to financing and insurance tailored to the conditions of the Agricultural Sector.

Objective: Create the conditions for improving the competitiveness of Agricultural Sector producers.

9.2.1 Strategic Line: Generating of information for the decision-making that encourage competitiveness

In order to achieve the modernization of the Agricultural Sector, this strategic line becomes an indispensable means for the producer to make decisions with technical support that allows for improved competitiveness.

The Sector's institutions must generate useful, reliable, understandable, and easily accessible information for producers to make the best decisions with a clear understanding of what might happen.

Proposed actions:

- Standardization of protocols for capturing relevant information for the Agricultural Sector.
- Generating information of interest to

  producers regarding economic, climatic, and national and international market variables.

- Building capacity among producers for a better understanding of the relevant information in the Agricultural Sector.

9.2.2 Strategic Line: Equipment and infrastructure for the production

This strategic line is proposed considering the importance of modern equipment and infrastructure tailored to the production reality in optimal conditions, facilitating primarily the economic development of rural areas with the greatest need.

Proposed actions:

- Update the project formulation methodologies for equipment to adapt to the regional reality and have an economic impact, improving resilience and adaptation to climate change, with an impact on production and rural development.
- Optimize the use of available infrastructure for the people engaged in production.
- Strengthen the Cold Chain service as component of the marketing chain.
- Support producers in modernizing and optimizing production processes.

9.2.3 Strategic Line: Effective and efficient services related to plant health and animal health

Supporting producers in gaining Access to international markets while protecting them from the entry of pests not present in the country, as well as ensuring Access to safe, wholesome, and quality products for the population, through competent institutions and the existing regulations in the field of plant and animal production with international standards, without hindering trade and the movement of people in a globally integrated country.

Proposed actions:

- Updating phytosanitary and zoosanitary standards based on risk models.
- Protecting the country's phytosanitary and zoosanitary heritage from potential threats posed by pests and diseases that could affect food security and the national economic activity.

9.2.4 Strategic Line: Financing and insurance access in the Agricultural Sector

This strategic line aims to create financing and insurance opportunities that allow producers greater Access to resources tailored to the needs of agricultural production. It also seeks to provide risk management tools that efficiently respond to potential events that may affect them. The proposed approach in this area is to expand financial and insurance markets with transparent financing and support for good management.

Proposed actions:

- Design and promotion of financial and insurance products with conditions and guarantees tailored to the needs of the Agricultural Sector, including the sustainable production component, in coordination with the financial and insurance sectors.
- Strengthening training and advisory services for financial inclusion and financing management in the agricultural and livestock production sector.

9.3 AXIS 3. PRODUCTIVITY AND SUSTAINABILITY

The innovation, research, and agricultural extension efforts carried out so far need to be transformed with the new tools of the technological revolution, efficiency in land and water use, and the integration of environmental and nutritional attributes.

Likewise, the relationship between agriculture and the environment, including climate change, has gained significance in the agendas of productive activities and, in particular, the Agricultural Sector. Actions aimed at promoting sustainable production models (organic production, NAMAs, Agricultural Ecologic Blue Flag, among others), and good agricultural, livestock, and fisheries practices, need to be strengthened through the design and implementation of management methods, both internally and in coordination with other sectors.

Objective: Contribute to increasing the productivity and sustainability of agricultural production through efficient mechanisms that address market challenges.

9.3.1 Strategic Line: Efficiency in the use of natural resources for production

This intervention line aims to guide actions for the responsible use of natural resources in agricultural production, in a way that allows for economic benefits while ensuring their sustainable use.

Proposed actions:

- Implementation of a technical assistance model that maximizes benefits for various production systems in terms of natural resource use.
- Promotion of the adoption of Good agricultural practices that favor the protection of human health, the environment, soil regeneration, water sources, and forest resources.
- Promotion of the use of technologies in primary and agro-industrial production to optimize the responsible use of natural resources.
- Strengthening of irrigation and drainage infrastructure programs to promote the efficient use of water resources.
- Promotion of economic recognition for those producers who implement effective actions that contribute to decarbonization goals, through traceability mechanisms and information for consumers.

9.3.2 Strategic Line: Availability and use of seeds and genetic material

Increasing the productivity of producers through the development of seed varieties that are resistant to various pests affecting production, either through domestic innovation or the importation of genetic material suitable for the sector's needs.

Proposed actions:

- Coordination among various stakeholders to promote research, development, production, sustainable use, and assurance of suitable seed and genetic materials (agricultural and livestock) for the characteristics of the production systems.
- Increasing productivity by promoting the use of high-quality seeds, whether through domestic innovation or importation.

9.3.3 Strategic Line: Sustainable production and irrigation management

The purpose of this axis is to drive the transformation of the Sector's systems towards a more sustainable and resilient production based on the adoption of technologies with potential productivity and environmental benefits. These technologies aim to reduce greenhouse gas emissions, make production less vulnerable to climate change, increase profitability for producers, and promote the sustainable use of natural resources.

Proposed actions:

- Strengthening of programs and initiatives aimed at promoting productive agroecosystems that are resilient, profitable, and environmentally sustainable.
- Scaling up the NAMA model in various productive activities to improve their competitiveness, profitability, and promote the reduction of Climate vulnerability in the Agricultural Sector by harnessing and enhancing ecosystem services.
- Promotion and recognition of the implementation of sustainable agricultural practices.
- Implementation of the National Adaptation Plan (NAP's) in the Agricultural Sector to reduce vulnerability.
- Simplification of the authorization procedures for new molecules and product registration for use in agricultural inputs to react promptly to materialized risks.
- Promotion of the production of bio-inputs to establish environmentally friendly production systems.

9.3.4 Strategic Line: Take advantage of technological Development in the Sector

This line of action aims to direct efforts for the Agricultural Sector to take advantage of technological and innovation opportunities for its competitiveness and profitability, while also encouraging the younger population to remain engaged in agricultural activities and contribute to the generational succession process.

Proposed actions:

- Use of instruments and tools in technical assistance and phytosanitary and zoosanitary surveillance. For example: drones, smartphones, satellite information, computer systems, among others.
- Building technological capacities for the effective use of new equipment and technological tools to enhance competitiveness.
- Promotion of technology use in the production activities of producers regarding digitalization.

9.3.5 Strategic Line: Investigation and transfer of agricultural technology

In the field of science, technology, and innovation (STI), Long-term planning and coordination are necessary at the political level to promote the generation of appropriate technologies that meet the sector's demands and advance biotechnology aspects. It is also important to develop methodologies that allow all producers and agribusinesses to harness these technologies.

The research system must be prepared to absorb new knowledge available internationally (such as ICT, Smart greenhouses, precision agriculture, robotics, etc.) and harness that knowledge to create technologies adapted to the agricultural sector's environment, and promote their adoption through efficient extension mechanisms. All of this requires a shift in research priorities, emphasizing topics related to agribusiness and fishing, such as value creation, value chains, nutritional quality, energy production, biomass utilization, and other areas.

Proposed actions:

- Development of an interagency and cross-sectoral research and innovation strategy to boost competitiveness and sustainability in the agribusiness sector.
- Utilization of experimental stations for the transfer of knowledge and technical updates to agricultural extensionists and facilitators.

9.4 AXIS 4. VALUE ADDED AND COMERCIALIZATION

Boosting the economic development of rural areas through value addition of local products, as well as transparent pricing in the market and identification of products with high export potential. These are factors that enable better participation of producers in marketing channels.

Objective: Enhance economic development through the aggregation of value, technologies, and competitive advantages in agricultural and fishing production.

9.4.1 Strategic Line: Boosting to the value added to primary production

The purpose of this line is to increase added value in agricultural production, allowing for greater integration of producers into marketing chains, creating commercial opportunities at the national and international levels. Furthermore, it aims to promote the diversification of agricultural and fishing products to Foster socioeconomic development in rural areas.

Proposed actions:

- Promotion of value addition for both the domestic market and exportable and differentiated offerings in agricultural and fishing products to create opportunities for Access to new markets.
- Identification of specialized market niches that involve producers in the creation of new products with high added value
- Development of sustainable agro-industrial Parks aimed at producers to integrate them into global value chains.

9.4.2 Strategic Line: Production chains

With the development and utilization of productive chains, the aim is to improve commercial and logistical aspects that contribute to product quality.

Proposed actions:

- Development of a regional productive chain strategy to harness market opportunities and supply the agro-industry.
- Promotion of associative mechanisms that allow for chains to meet market needs, both domestically and internationally.
- Modernization of Institutional Supply Programme (PAI) to enhance sectoral access

9.4.3 Strategic Line: Development and harnessing of physical and virtual markets for commercialization

The technological modernization in the marketing chain allows for greater Access and promotion of agricultural and fishing products in various markets. As a result, efforts are focused on improving and creating new marketing channels through the implementation of virtual tools that can connect supply and demand more efficiently and effectively.

Proposed actions:

- Accompanying the development of skills of agricultural and fishing producers in innovative techniques and tools that facilitate marketing.
- Promotion of the development and implementation of efficient virtual platforms that allow or facilitate the marketing of agricultural and fishing production, as well as price formation.
- Promotion of short marketing circuits in different territories of the country, thus contributing to economic decentralization processes and stimulating the development of these territories.
- Modernization of wholesale markets to make marketing processes more efficient, by promoting competition and transparency in price formation.

9.4.4 Strategic Line: Food and nutrition security

Strengthen the Costa Rican food system to offer consumers a wide variety of nutritious, quality, and affordable foods to meet their needs.

Proposed actions:

- Strengthening actions that promote the availability and Access to quality, safe, and diverse foods for a balanced diet.

- Design and implementation of actions to harness waste at various stages of the production, marketing, and consumption of agricultural and fishery products.

10. MANAGEMENT MODEL

The management model to implement this Policy proposes effective coordination among the institutions that make up the Agricultural Sector, as well as linking and coordinating with public institutions from other sectors and cooperation agencies, all in pursuit of the benefit of the productive sector.

Figure 3

Management model of the Public Policy for the Costa Rican Agricultural Sector 2023-2032.

Fuente: SEPSA, self-elaboration, 2022.

This coordination is developed at the national level through the CAN, led by the MAG in their capacity as the head of the Agricultural Sector. The council is composed of 11 institutions that make up the sector.

At the technical level, the COTECSA, consisting of the directors of planning from the sector's institutions, is responsible for incorporating the respective strategic axis, lines, and actions of the Policy into their institutions' medium-term and annual operational plans. This facilitates their monitoring and subsequent evaluation.

At the regional and local levels, coordination is carried out through regional entities to establish mechanisms between the public sectors and the productive sector, aiming to improve the performance and effectiveness of the services provided by public institutions in the regions.

The actions of the Policy Will be implemented in the 2023-2027 Agricultural Sector Plan, which should be developed by axis, strategic lines, and goals with corresponding indicators to be executed by the public institutions.

11. MONITORING **AND EVALUATION**

The monitoring Will be carried out through the implementation of the Sectoral Plan, which Will allow for the establishment of improvement actions and be transparent in the accountability process. The Secretariat of Agricultural Sector Plan Will work on the design and preparation of monitoring, which includes the review of objectives, goals, stakeholders, and responsibilities; the review of indicators; and the definition of tools for data collection and the determination of monitoring.

It is important to take account this monitoring and evaluation model requires the annual preparation of reports that reflects the progress, limitations, and adjustments for the progressive fulfillment of the proposed actions for each of the strategic axes of the Policy

12. CONSULTED SOURCES

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1.5 Translation from English to Spanish: The Avocado Industry in Israel

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RESUMEN DE LA INDUSTRIA DE AGUACATES EN ISRAEL

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CONDICIONES MEDIOAMBIENTALES DE CRECIMIENTO

Clima:

Israel está ubicado a lo largo de la parte sur de la costa oriental del mar Mediterráneo, entre las latitudes 30° y 33° Norte. El clima en las regiones de cultivo del aguacate es subtropical, con veranos cálidos y secos e inviernos frescos y lluviosos. La época lluviosa se extiende principalmente de noviembre a marzo. Las precipitaciones anuales varían desde un promedio de 200 mm en el sur hasta 700 mm en la costa norte. Aunque la mayor parte de la plantación de aguacates en el país se encuentra junto a la llanura costera (ver más adelante), hay una notable área de crecimiento en el interior de valles calientes.

La Tabla 1 resume las temperaturas máximas y mínimas de cada mes en dos ubicaciones: Bet Dagan, en la llanura costera, y Degania, en el cálido valle del Mar de Galilea. Las temperaturas bajo cero no son comunes en las áreas de cultivo del aguacate. Se han establecido huertos de árboles frutales considerando la topografía, y se evitan sitios propensos a heladas, especialmente desde mediados de la década de 1970, según una encuesta topoclimatológica a nivel nacional

implementada por el Servicio Meteorológico de Israel. Sin embargo, en algunas áreas de cultivo de aguacates, las temperaturas han descendido entre -2°C y -4°C, y en casos particulares han llegado a -7°C en ciertos años.

Se han registrado daños severos a las frutas y los árboles bajo ciertas condiciones. Una amenaza más grave para el cultivo de aguacates son las condiciones meteorológicas adversas que ocasionalmente se presentan en abril y mayo, durante el período de floración y cuajado de frutos. Períodos de calor extremo ("Chamsin") de 40°C e incluso, en raros casos, 46°C (acompañados de una humedad muy baja) han provocado graves pérdidas de cosechas, especialmente cuando han persistido durante varios días y se han producido justo después del final de la floración. Esto ocurrió a nivel nacional en 1970, 1980 y 1988.

Table 1: Mean daily maximum and minimum temperatures per month (C.) in Bet Dagan and Deganya Alef.

Month	Bet Dagan		Deganya Alef	
	Minimum	Maximum	Minimum	Maximum
January	6.6	17.9	8.4	17.6
February	6.8	19.2	8.8	19.6
March	8.6	21.5	10.4	22.5
April	11.6	24.6	13.0	26.8
May	13.6	26.7	16.3	31.7
June	17.7	29.3	16.3	34.9
July	19.3	30.6	19.0	36.0
August	19.6	30.9	22.0	36.1
September	18.1	28.0	20.6	34.6
October	14.8	26.9	17.5	30.5
November	11.2	24.2	13.7	25.0
December	8.2	19.4	9.9	19.1

Note: Bet Dagan represents the coastal plain; Deganya Alef represents the hot valley of the Sea of Galilee (Altitude 200m. below sea-level).

Suelos:

Se plantaron tres cuartas partes de las áreas totales de aguacate en el país en varios tipos de suelos, principalmente grumosoles, caracterizados por su textura pesada y un contenido de cal ($CaCO_3$) de 8-20 %, con un pH de 7.8 a 8.2 y un drenaje interno aceptable. En la llanura costera, algunos huertos de árboles frutales son

plantados en suelos francoarenosos sin cal (pH 7-7,3), mientras que en el suroeste se utilizan suelos con un contenido de cal del 5-10 %. En el valle del Mar de Galilea, algunos huertos de árboles frutales se establecen en suelos altamente calcáreos (40 % $CaCO_3$), con árboles injertados en portainjertos específicos y adaptables (ver párrafo “Portainjertos”).

Riego de agua:

Todos los huertos de aguacates reciben riego regular durante la época cálida y seca. La mayor parte del agua en Israel es suministrada por una empresa pública y asignada por la autoridad estatal del agua de acuerdo con cuotas vinculadas a mandatos de tierra. El agua se bombea desde embalses subterráneos, con un contenido de cloro de 50 a 400 ppm, o se suministra a través del Acueducto Nacional, que se origina en el Mar de Galilea y contiene de 190 a 250 ppm de Cl. El gobierno determina el precio del agua (actualmente 18 centavos estadounidenses por 1 m^3).

DISTRIBUCIÓN REGIONAL DE HUERTOS DE ÁRBOLES FRUTALES

De cada 7800 ha de aguacates en el país (1995), aproximadamente 5800 ha (alrededor del 72 %) se ubicaron junto a la llanura costera, principalmente en las partes centrales y norte, incluyendo un 3 % en el “oeste de Néguev”, en el sur. Otras 1600 ha, aproximadamente el 20 %, se expandieron en el interior del Valle de Jule (al norte), el Mar de Galilea y el Valle de Jezreel. Las 600 ha restantes, aproximadamente el 8 %, están plantadas en el sur de la región de Laquis y en la estribación de los Montes de Judea. Los huertos frutales con altas producciones pueden encontrarse en todas estas regiones. Sin embargo, la llanura costera norte de Acre, conocida como “Galilea Occidental”, fue destacada durante años por su alto promedio de cosechas, probablemente resultado de factores como un clima favorable, suelos apropiados y baja salinidad en el riego de agua. Además, el porcentaje de “Hass”, la variedad más productiva con un coeficiente de variación en el país durante un largo período, era más alto allí que en otras regiones.

Las cosechas regionales mencionadas han disminuido en los años recientes, en parte debido al aumento de la salinidad en el riego de agua local y también a la disminución en la producción promedio de “Hass”, un fenómeno nacional que aún debe ser explicado. Esto se demuestra en la Tabla 2.

Los kibutz (asentamientos cooperativos) cultivaron el 70 % del área total de aguacates en el país, con tamaños de 30 a 100 ha. El resto consiste principalmente en familias pequeñas con huertos de árboles frutales de 1 a 3 ha. La Tabla 2 representa un área de 1500 ha de huertos frutales pertenecientes a los kibutz. Los datos fueron proporcionados con la cortesía de la empacadora regional “Miluot”. Nota: La tabla no debe ser malinterpretada: no representa promedios nacionales.

Table No. 2: Yields by cultivars in various periods, in the "Western Galilee" (T/Ha, rounded off)

Cultivar	Average of 10 seasons 1970/1-1980/1	Average of 4 seasons 1983/4-1986/7	Average of 6 seasons 1988/9-1993/4
Ettinger	13.0	16.5	10.5
Fuerte	8.5	12.5	7.5
Hass	15.0	15.5	8.0
Nabal	14.0	17.0	13.0

EL DESARROLLO DE LA INDUSTRIA – UNA BREVE HISTORIA

En 1924, se introdujeron en Israel los primeros árboles de aguacate injertados (para la escuela agrícola Mikvé Israel). Se inició una investigación a principios de los años treinta (Introducciones y observaciones argumentales). En la década de los cuarenta, se establecieron pequeños viveros de aguacates. A partir de los años cincuenta, comenzó la plantación a escala comercial y en 1960, el área total de aguacates alcanzó las 300 ha. El éxito inicial en la exportación a escala comercial del aguacate incentivó aún más la plantación, y en 1970, el área creció a 2100 ha, de las cuales 1000 ha ya estaban en producción,

generando 7200 toneladas (de las cuales 4400 fueron exportadas). Durante los siguientes 13 años, el área se expandió rápidamente, alcanzando su máximo de más de 11 000 ha (55 % en sus inicios). En 1983, la producción estaba cerca de las 60 000 toneladas, de las cuales el 80 % se exportó. El rápido crecimiento se debió a una combinación de varios factores, principalmente:

a) Alta rentabilidad en las décadas de 1960 y 1970, debido a cosechas suficientes (promedio de 10 toneladas por ha) y precios de exportación muy altos: 2000-2800 dólares por tonelada (ajustado al valor del dólar actual), FOB de Israel. Estos precios se obtuvieron en Europa gracias a intensas y costosas actividades promocionales.

b) Apoyo financiero del Gobierno (20 % en subsidios más 50 % en préstamos en costos establecidos) y otros fondos nacionales para la plantación y exportación de cosechas frutales.

c) Requisitos relativamente bajos de mano de obra en comparación con otras cosechas frutales. Este aspecto fue especialmente importante para los kibutz, que intentaron evitar contratar trabajadores. En los años sesenta y setenta, se destacó la investigación intensiva y las actividades prolongadas en aguacates, llevadas a cabo por el Ministerio de Agricultura, con una gran participación activa de organizaciones de agricultores y agricultores individuales.

A principios de los ochenta, la situación empeoró. Los siguientes factores fueron responsables de este cambio:

1) Desde 1982 hasta 1983, los agricultores experimentaron algunas temporadas consecutivas de malas tasas de cambio por tonelada, en parte debido a la tasa de cambio desfavorable, especialmente en las temporadas de 1984 y 1985 (ver Tabla 3).

2) La temporada de 1986 y 1987, con una cosecha abundante sin precedentes de 127,000 toneladas, fue seguida por una sucesión de varios años con cosechas escasas. Esto se debió a una coincidencia de alternancias fuera de temporada en 1987 y 1988,

seguido por la desastrosa temporada de 1988 y 1989 (el 85 % de la cosecha fracasó debido a una rara ola de calor), seguida por la fuerte helada de febrero de 1989.

La producción escasa también tuvo lugar en las temporadas de 1992 a 1994, en las cuales las condiciones ambientales podrían haber desempeñado un papel parcial.

3) La plantación generalizada a finales de los setenta y principios de los ochenta se extendió a climas marginales y suelos de subregión. Además, los recursos de malos retoños, a veces con portainjertos no aptos para tipos de suelos locales y la salinidad del riego de agua, no eran muy comunes en esa época.

4) El aumento gradual en la salinidad del riego de agua en zonas considerables probablemente ha causado una disminución en las cosechas, especialmente en huertos de árboles frutales plantados originalmente en portainjertos mexicanos (los cuales son susceptibles a la salinidad).

5) Una serie de años de sequía provocó una reducción en las cuotas de agua para la agricultura a principios de los 90, incluyendo las arboledas de aguacates. Muchos agricultores redujeron sus riegos en un 20 %-25 % durante 2 a 3 años hasta 1994, cuando las cuotas aumentaron.

La Tabla 3 muestra las caídas en la producción de aguacate en Israel. Desde finales de los ochenta, los cultivos irregulares y bajos han sacudido la posición dominante de Israel como el principal proveedor estable de aguacates en el mercado europeo. Mientras tanto, la creciente demanda de aguacates en esos mercados ha atraído ofertas de otros países. Todos los problemas anteriores prácticamente han paralizado las nuevas plantaciones y han causado una tendencia de negligencia y arranque de huertos de aguacate. Actualmente, las áreas plantadas son aproximadamente 7,800 ha, de las cuales el 10 % son injertos nuevos o plantaciones nuevas, que se han reanudado gradualmente desde 1992, principalmente por agricultores experimentados.

CULTIVARES

En 1970, con un total de 2000 ha de zona de aguacates, el porcentaje de los cultivares principales era el siguiente: “Fuerte” – 43 %, “Ettinger” - 20 %, “Hass” - 17 %, y “Nabal” - 10 %. Esta distribución se basó en la experiencia acumulada y en las preferencias de los mercados de exportación de ese tiempo. Las recomendaciones sobre cultivares fueron establecidas por la Tabla del director de fruta subtropical y por el Servicio de Extensión. La Tabla ha guiado la investigación y el desarrollo de la industria del aguacate en el país desde 1960 hasta 1989, e incluye representantes de la investigación, servicios de extensión, agricultores y la organización exportadora. El porcentaje anterior de los cultivares ha cambiado considerablemente durante los últimos 50 años, y en 1995, la situación era la siguiente: “Fuerte” - 25 %, “Ettinger” - 25 %, “Hass” - 30 %, “Nabal” - 4 %, y “Reed” - 6 % (los valores son estimados).

A continuación, se presentan algunos comentarios sobre las principales variedades de aguacate rentables, todas introducidas en Israel desde California, excluyendo la primera.

Ettinger: Una selección local de una plántula casual. Su origen es desconocido, pero contiene ciertos rasgos mexicanos como la tolerancia a temperaturas bajas (4 horas a -6°C en un árbol maduro) y cáscara delgada. La temporada de cosecha es temprana, pero corta: principalmente de octubre a noviembre. La cáscara es verde brillante y tiene un buen tamaño comercial. Alta calidad interna. Los rendimientos son buenos en general. Un potente polinizador de las plantas ‘Hass’ y ‘Pinkerton’ (y posiblemente otros cultivares).

‘Fuerte’: Aparentemente, se presentaron varios clones en Israel, algunos de los cuales no eran productivos. La práctica del anillado, aplicada en algunos huertos de árboles frutales (principalmente en

los años setenta), no resolvió el problema del rendimiento irregular y bajo de este cultivar. Por lo tanto, perdió su dominio en los huertos de árboles frutales y fue arrancado de raíz o reemplazado por cultivares más productivos en muchos huertos. Esta tendencia se ha desacelerado recientemente debido a resultados alentadores con la aplicación de Paclobutrazol, que mejoró los rendimientos. La principal temporada de cosecha es de noviembre a febrero.

'Hass': El cultivar más rentable y fructífero hasta 1987 y 1988; desde entonces ha experimentado una disminución en los rendimientos promedio (ver Tabla 2) hasta 1995. Este cultivar presenta un tamaño promedio pequeño, un fenómeno que empeora en plantaciones antiguas debido a la mala aireación del suelo (incremento de compactación) y a las condiciones de aumento de la salinidad del agua. Todo lo anterior es común en la industria. La temporada de cosecha es de noviembre a abril.

'Nabal': El árbol es muy delicado a las tormentas invernales (rotura de ramas y caída de frutas), heladas y a la "*Pyriform Scale*" (ver "Plagas y Enfermedades"). Portador fuertemente alterno. El tamaño promedio es mayor de lo deseado. La temporada de cosecha es principalmente en marzo y abril.

'Reed': Presentado solo en 1969. Un árbol precoz y productivo. Sus frutas son ligeramente grandes. Su principal temporada de cosecha para la exportación es de abril a mayo, pero muchos agricultores retrasan la cosecha hasta el verano (junio a agosto) para el mercado local.

Otras variedades cultivadas a escala comercial (2-3 % cada uno) son:

'Pinkerton': Principalmente en los cálidos valles interiores. Muy productivo. Se recogen en diciembre y junio.

‘Ardith’ (“00-28”): Resultado del programa de cría del Dr. Berg en la UC Riverside. Principalmente exitoso en la llanura costera. De cáscara verde oscuro, se recogen en marzo hasta abril.

En los huertos de árboles frutales antiguos, todavía hay pequeñas cantidades de zonas de Wirtz, Benik y Horshim (una plántula casual local). Las recientes plantaciones consisten en los siguientes cultivares, ordenados según su importancia: ‘Reed’, ‘Pinkerton’, ‘Ettinger’, ‘Hass’ y ‘Ardith’. Ningún otro cultivar resultante del programa de cría local o por introducción ha alcanzado aún la etapa de ser recomendado para la plantación comercial; nuevos tipos se están evaluando ahora en una escala experimental menor.

PORTAINJERTO

En la década de 1960, el árbol madre de semillas portainjerto era cientos de diferentes árboles plántula, principalmente de origen mexicano. Además, las semillas se obtenían de cultivares mexicanos como el Topa-Topa, Northrop y Mexicola; los guatemaltecos (Nabal) y, posteriormente, de la India Occidental o sus híbridos, como el “Lula”, “Winslowson”, “Waldin”, “Fuchs”, etc.

En ese periodo, se inició un campo de investigación en portainjerto de aguacates a gran escala. En este trabajo sin precedentes, liderado por la Dra. A. Ben-Ya’akov, muchos huertos de árboles frutales nuevos se plantaron con un diseño de plantación de varios portainjertos organizado de antemano, sin interferir con el plan original de cultivares en cada huerto. Un grupo grande de agricultores de aguacate participaron activamente en este programa; recopilaron datos de rendimiento por cada árbol de su huerto comercial, lo cual era una práctica común en muchos huertos de árboles frutales en el país hasta mediados de los ochenta (centrada en el aclareo de árboles menos productivos).

El anterior “experimento de ámbito nacional” incluía cientos de portainjertos diferentes y poco a poco creció a 300 parcelas diferentes con más de 140 000 árboles. La plantación anterior continuó en los ochenta e incluyó experimentos con portainjertos clonados. Se encontraron diferencias notables en los efectos de los diversos portainjertos de plántula (y después, de portainjertos clonales) con respecto a la consideración de fecundidad, tolerancia a la salinidad alta, contenido alto de cal e incluso aireación del suelo.

Poco a poco y constantemente, los portainjertos de menor calidad fueron eliminados de la lista de árboles madre recomendados. En la última década, se agregaron a la lista los portainjertos clonales (vegetativos), seleccionados a nivel local por la Dra. Ben-Ya’acov, incluyendo “VC 6”, “VC 51”, “VC 65”, “VC 66” y otros. Ya son muy solicitados por los agricultores, aunque aún se utilizan en una escala limitada. Las peticiones recientes son principalmente de árboles de viveros injertados en surtidos de portainjertos sin semillas, especialmente el “Degania 117” y algunos “Ashdot 17”, ambos tipos de la India Occidental. Además, los portainjertos que crecieron a partir de semillas de ciertos cultivares de la India Occidental son muy solicitados, como el “Waldin” y el “Fairchild”.

PRÁCTICAS CULTURALES

Riego:

Aproximadamente el 85 % de la zona de aguacate en Israel se riega con mini aspersores (con distintas salidas y tipos). En el resto se utiliza el riego por goteo. No se han encontrado diferencias obvias entre los dos métodos hasta el momento en cuanto a las consecuencias del rendimiento en huertos de árboles frutales. Sin embargo, los mini aspersores, incluso bajo el dosel, se consideran ventajosos, ya que significan un alivio parcial de

los daños por heladas o calor. El cálculo del consumo diario de agua se basa, como en muchos huertos de árboles frutales, en datos regionales o locales de evaporación (del tanque de evaporación tipo A) y lecturas regulares de tensiómetros. La práctica común reciente de riego no se basa en los resultados de algunos experimentos de riego llevados a cabo en los años sesenta y setenta (con riego por aspersión que cubría la mayoría de la superficie) o en los ochenta (con mini-aspersores). La práctica típica actual de riego durante la temporada máxima (julio hasta septiembre) para huertos de árboles frutales maduros es la siguiente: intervalos de 2-3 días entre riegos (con mini-aspersores) y una dosis de agua calculada en un índice del 0.70 de la evaporación. Esto significa un uso diario de 5-5.5 mm en la llanura costera (alrededor de 8000 m3/Ha por temporada) y 7 mm en el interior de los valles calientes (alrededor de 10 000 m^3/ha por temporada).

Los recientes campos de observación en riego, asistidos por dendrómetros, aún no han arrojado resultados probados que justifiquen cambios en la práctica de riego existente.

Fertilización:

Hasta ahora, los resultados de varios experimentos en la fertilización del aguacate no han sido suficientes para servir como guía de recomendaciones generales en Israel. Las prácticas actuales en la mayoría de los huertos de árboles frutales se basan parcialmente en los resultados de análisis de hojas, pero más en experiencias y observaciones locales, en el vigor del árbol y la carga del cultivo, y en la consulta con el personal de extensión o un investigador regional. La práctica común actual es la “fertirrigación” a lo largo de toda la temporada de riego. En algunos huertos de árboles frutales, se practica la aplicación de N (1/4 de la dosis anual) antes de la floración.

Una dosis común anual por Ha de comportamiento de huertos de árboles frutales es de 200-300 kg de N, 50-70 kg de P_2O_5 y 200-400 kg de K_2O. El abonado (con compost) es común en algunos huertos de árboles frutales, principalmente en plantaciones “bio-orgánicas” (150-200 ha). La clorosis inducida por hierro es común en muchas zonas, ya sea por el contenido alto de cal en el suelo junto con el último uso de portainjertos susceptibles, o por la mala aireación del suelo. La fertilización con quelatos de hierro es una práctica común para la corrección.

La falta de zinc se observa ocasionalmente, pero rara vez se trata. Por ahora, se ha prestado muy poca atención a la falta de boro porque los síntomas visuales comunes eran prácticamente imperceptibles. Parece que este problema merece más atención a la luz de los bajos niveles relativos de boro en muchos resultados de análisis de hojas.

La gestión de multitud de árboles (poda, aclareo, otros):

En el pasado, se planificó una densidad de plantación común para aguacates en Israel, de 270-410 árboles/ha (según las condiciones de cultivo y crecimiento) para futuros aclareos de árboles. Esta práctica se recomendó especialmente para el “Fuerte” y el “Nabal” en aquellos tiempos; la solución sugerida para los problemas de multitud y sombra en el “Hass” fue la poda. Sin embargo, los agricultores a menudo tardaban en llevar a cabo el aclareo, y la poda era ligera o limitada por algunos despuntes. Esta situación ha cambiado recientemente, y desde finales de los ochenta, la cobertura y los despuntes anuales (ya sea mecánicos o manuales) se han convertido en la práctica común de gestión de la multitud de árboles en lugar del aclareo de árboles.

La gestión del suelo en huertos:

La práctica común en huertos jóvenes consiste en la aplicación de herbicidas de preemergencia cerca de los árboles (en una franja de 1-1,5 metros) dos veces al año, y ocasionalmente se realiza el corte de la hierba entre las filas. En huertos maduros, la necesidad de controlar las malas hierbas disminuye considerablemente debido a la sombra, junto con el acolchado natural con hojas acumuladas. Las ramas podadas generalmente se trituran y se utilizan como acolchado adicional.

Polinizadores y polinizador:

En años recientes, la investigación local, respaldada por la técnica de isoenzimas, ha demostrado que el “Ettinger” es un polinizador eficaz para el “Hass”, “Pinkerton” y tal vez para otros cultivares. La aplicación de estos hallazgos ya se ha llevado a cabo en todas las nuevas plantaciones, así como en muchos huertos en producción donde se ha plantado el “Hass” en bloques sólidos (mediante la injertación del 10-15 % de los árboles con “Ettinger”).

Todavía no hay respuestas claras con respecto a la necesidad de polinización cruzada de “Ettinger”, “Fuerte” y “Reed”. Las abejas melíferas son los principales polinizadores del aguacate en Israel, y la mayoría de los agricultores alquilan colmenas de abejas para este propósito (alrededor de 2-3 Ha).

PLAGAS Y ENFERMEDADES

Las plagas en el aguacate de Israel no son un gran problema, probablemente debido a distintos factores:

a) Conservación cuidadosa del equilibrio biológico natural, gracias a una investigación y extensión intensivas, así como a prácticas estrictas de control biológico.

b) Al ser un cultivo relativamente nuevo en un país distante de sus orígenes.

c) Se implementaron medidas de cuarentena estrictas durante la introducción de material de propagación del aguacate y la prohibición de importar frutos de aguacate.

d) Eventos de temperaturas extremadamente altas y bajas que podrían haber dificultado el desarrollo de algunas plagas de aguacates comunes en los trópicos.

Las plagas de aguacates más importantes en Israel son:

Boarmia setenaria: Un gusano que se alimenta de frutos pequeños y frutos, lo que puede causar una reducción considerable en el rendimiento y daños en los frutos si no se controla a tiempo (mediante 1-2 rocíos con *Bacillus thuringiensis*). El *Pyriform Scale* (*Protopulvinaria pyriformis)* ataca severamente al “Nabal” y se ha observado en otros cultivares. Las medidas de control generalmente son aerosoles con aceite mineral, combinado con la liberación de avispas del género *Metaphycus* o de *Cryptolaemus montrouzieri.*

El invernadero de *Thrips (Heliothrips haemorrhoidalis)* puede atacar esporádicamente a varios cultivares (el “Ardith” es particularmente susceptible).

El clima en Israel es desfavorable para el desarrollo de enfermedades en la fruta o el dosel del aguacate. La pudrición de la raíz del aguacate (*Phytophthora cinnamomi*) fue identificada por primera vez en Israel en 1982. Hasta ahora, su propagación se ha limitado a solo 40-50 ha, principalmente en áreas húmedas con suelos muy pesados u otros lugares con un drenaje pobre. Se está llevando a cabo la selección de portainjertos locales resistentes o tolerantes. En algunos años, principalmente en el “Hass”, la necrosis descendente de las ramas en la inflorescencia puede causar graves daños al reducir considerablemente el rendimiento de los árboles infectados. El factor responsable de este fenómeno todavía es desconocido.

COSECHA Y EMPAQUETADO

La cosecha del aguacate en Israel está controlada por la Corporación Nacional del Aguacate. Nueve centros de empacadoras sirven a la industria: dos principales (del 20-30 % total de cada una), cuatro de tamaño mediano (del 8-20 % cada uno), y tres pequeños (del 3-4 % cada uno). Los estándares nacionales de exportación para la madurez de la fruta y la calidad externa, que son más estrictos que los estándares de la Comunidad Económica Europea (CEE), son establecidos por un comité reglamentario e inspeccionados por el Servicio de Inspección de Productos Agrícolas para la Exportación del Ministerio de Agricultura.

La Corporación del Aguacate lleva a cabo estimaciones detalladas de la cosecha por variedades y regiones, y formula un programa provisional de cosecha semanal para toda la temporada. Esto se planificó con AGREXCO Ltd., el único exportador, por ley estatal, de aguacates y de muchos otros productos agrícolas.

Al inicio de la temporada (generalmente en la última semana de septiembre), la cosecha inicia en cada zona según los criterios de porcentaje de materia seca (representando el contenido de

aceite) por cada cultivar. Lo anterior se determina después de una repetida encuesta sistemática de muestreo. Luego, la cosecha continúa según un programa semanal replanificado y el reparto de cuotas por parte de la sede de la Corporación por cada empacadora. Esto se basa en consideraciones conjuntas de la demanda del mercado, tamaño de las existencias, disponibilidad de productos en cada ubicación, etc. La cosecha selectiva (por tamaño) es común. Se utilizan cientos de escaleras hidráulicas, producidas en Israel, para la recolección en árboles altos de hasta 6,5 metros de altura. Todos los aguacates exportables son empaquetados en cartones de 4 kg y exportados (enviados por mar).

El porcentaje de exportación promedio de toda la cosecha registrada ha sido alrededor del 70 % en años recientes. Casi todo el resto es vendido en el mercado local por la Corporación. Los productos imperfectos y frutas de la industria rara vez exceden el 1-2 % de la cosecha.

PRODUCCIÓN, EXPORTACIÓN Y PRECIOS

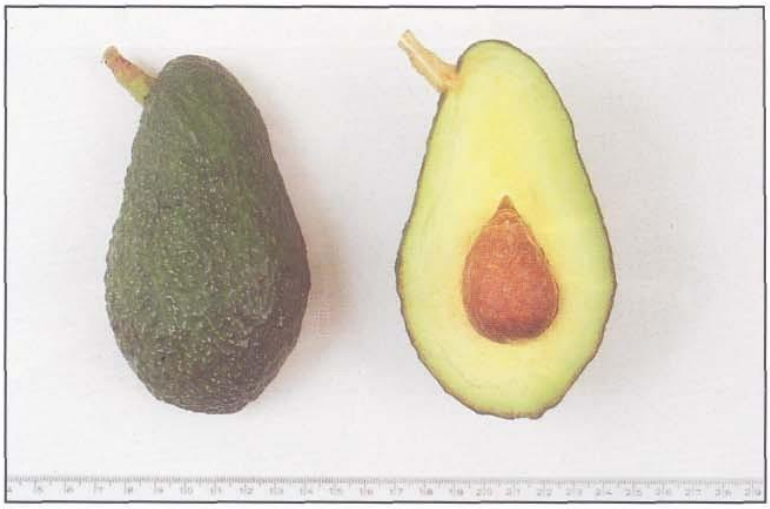
Table 3: Israeli avocado - production and export (in 1,000 tons, rounded off)

Season	Production	Export	F.O.B. Price/T, US$
1979/80	32	26	1,630
1980/81	8[a]	7	2,200
1981/82	40	33	1,400
1982/83	59	49	960
1983/84	52	43	970
1984/85	75	60	760b
1985/86	65	52	1,030
1986/87	127	88	930
1987/88	33	26	1,480
1988/89	17[a]	12	1,840
1989/90	46	35	1,350
1990/91	53	38	1,410
1991/92	74	50	1,160
1992/93	38[c]	27	1,200
1993/94	43[c]	29	1,250
1994/95	51[c]	36	1,230
1995/96 (est.)	80	60	

a= Rare extreme heat-wave in May destroyed most of the crop.
b= Unfavorable exchange-rate for the dollar.
c= Estimated 10% should be added in view of increased non-registered commerce since 1992/3.
Source: Fruit Marketing Board, and the Avocado Corporation.

La Tabla 3 presenta datos anuales sobre la producción nacional registrada de aguacate, las exportaciones y los precios promedio del FOB de las últimas seis temporadas (prácticamente cada una se extiende desde septiembre hasta mayo). La comercialización local no registrada de aguacate ha aumentado en los años recientes, quizás debido a la creciente demanda y otras razones. Debido a esto, se estima que se debe agregar un 10 % a cada una de las cosechas registradas de los últimos tres años. Por lo tanto, la cosecha real de 1994/5, por ejemplo, fue de 56 000 toneladas (al contrario de lo que dice la tabla).

Los países de destino principales de la exportación de aguacate desde Israel han sido Francia (50 %-60 %), Alemania (15 %) y Gran Bretaña (10 %).



'עדי'
'Adi'

'גיל'
'Gil'

'עירית'
'Irit'

PRINCIPALES PROBLEMAS ACTUALES EN LA PRODUCCIÓN

1) Promedio nacional de producción/ha: Esta producción ha sido de 7,5 toneladas en los últimos seis años (incluyendo el estimado de 1995/6) y se considera justo cuando se compara con el mismo promedio de California o España (especialmente en vista del porcentaje considerable de un pobre soporte como el “Fuerte”). No obstante, esta producción es insuficiente para los productores israelíes bajo los costos actuales de producción y empaque, y en vista de la situación comercial de aguacates. Esta insuficiencia puede aumentar incluso en el futuro. Se ha encontrado que existen diferencias considerables en las producciones por Ha entre huertos con el mismo cultivar en la misma región. Esto solo se puede explicar por grandes diferencias en el nivel de gestión del huerto, lo que puede demostrar el potencial no aprovechado de producción en la zona de aguacates existentes. Por lo tanto, hay una necesidad de intensificar las actividades de extensión, dirigidas a aumentar los niveles profesional y administrativo de los agricultores.

Otro motivo adicional de la insuficiente producción/Ha puede ser lo siguiente: La floración y cuajado de frutos de los principales cultivares comerciales se lleva a cabo en febrero a mayo, una temporada con climas muy inestables con temperaturas muy altas y/o muy bajas para una polinización y cuajado de frutos óptimos. Los daños importantes al cultivo de aguacate han sido causados casi siempre por olas de calor extremas poco después del cuajado de frutos. Además, a menudo hay una notable reducción en la actividad de las abejas (polinización) en huertos de aguacates durante la principal temporada de floración en los cultivares importantes, la cual coincide con la floración de competidores muy fuertes, como las vastas zonas de cítricos y de vegetación silvestre.

En la opinión del autor, las investigaciones dirigidas a retrasar la floración de los cultivares importantes por 2 a 4 semanas son necesarias. La floración tiene que cambiar a un periodo más

favorable para la polinización y cuajado de frutos, con climas estables, así como el fin del florecimiento de plantas competitivas.

2) Aumento de salinidad: La salinidad del riego de agua subterránea en las principales regiones productoras de aguacate está aumentando gradualmente, y puede ser responsable, al menos en parte, de la disminución de los rendimientos en esas zonas, especialmente donde los huertos se plantaron en portainjertos mexicanos. Al parecer, es necesario intensificar la investigación en portainjertos clonales para maximizar la producción bajo condiciones de agua salada y, así mismo, poder hacer frente a futuros riesgos en este aspecto.

3) Escasez de agua: El aumento de precios y la escasez del riego de agua pueden ocasionar, en el futuro, una limitación importante en toda la industria. Tal vez este problema se puede identificar como el mayor problema de producción crucial a largo plazo.

4) 'Hass': Este es el cultivar más importante, pero expone serias desventajas como la reducción inexplicable en sus rendimientos en los últimos años (excluyendo 1995/6) o el tamaño promedio de la fruta, que es pequeño en comparación con lo requerido por el comercio. Es difícil pronosticar si el programa de mejoramiento intensivo (y costoso) llevado a cabo en Israel por las últimas dos décadas vendrá con un nuevo cultivar que será un sustituto exacto del "Hass" (o de cualquier otro cultivar existente). No obstante, la búsqueda de nuevos cultivares debe convertirse en un proyecto permanente.

En la opinión del autor, los tipos de introducción y evaluación consecuente de programas de mejoramiento extranjeros han dado fruto a un cultivar comercial en Israel ("Ardith"), y esta actividad debería continuar.

ASPECTOS ECONÓMICOS

El análisis económico de la industria del aguacate en Israel implica muchas variables que ponen restricciones en simplificar este campo complejo. Sin embargo, la siguiente información ayudará a señalar los factores principales que afectan al éxito económico de la industria del aguacate en Israel (sin incluir los factores comerciales, que no se discutirán en este artículo).

1) El rendimiento promedio de huertos bien cuidados en la llanura costera ha sido de 10 toneladas por ha por un periodo de 25 años (1961 – 1986). En ese periodo, se producían en huertos excepcionales los siguientes rendimientos promedio:

'Fuerte' - 12 toneladas por ha, 'Ettinger' y 'Nabal' - 18 toneladas por ha, 'Hass' - 20 toneladas por ha. Esto puede demostrar el potencial que no se notó en zonas grandes, debido a razones complejas parcialmente discutidas en párrafos anteriores.

2) El precio de establecer un huerto de aguacates en Israel se calcula en 15 000 US$/ha, sin incluir el costo del terreno.

3) El precio de contratar mano de obra en la agricultura ha sido de 3 a 5 US$ por hora recientemente.

4) El precio promedio del riego de agua es de 18 centavos US/1m^3 (1995).

5) El precio variable de producción por 1 ha de aguacate en Israel, incluyendo el "Ettinger", el "Hass" y el "Reed" en partes iguales, se calcula de la siguiente manera: 8850 US$ en la salida de la empacadora, con un rendimiento calculado de 12,3 toneladas por ha. La ganancia neta de los agricultores es de 2850 US$/ha (Fuente: Departamento de Economía Agrícola, Servicio de Extensión, noviembre de 1994).

INVESTIGACIÓN Y EXTENSIÓN

La industria del aguacate en Israel se ha caracterizado desde sus inicios por contactos cercanos y el flujo rápido de información entre el Servicio de Extensión, el Instituto Volcani de Investigación Agrícola, la Facultad de Agricultura en Rejovot y los agricultores. Los dos primeros organismos son parte del Ministerio de Agricultura. En 1995, el Ministerio contribuyó con 300.000 US$ a la investigación del aguacate, además de cubrir parcialmente los costos de infraestructura y salarios. La Corporación de Agricultores de Aguacate invirtió 200 000 US$ más una contribución adicional de 50 000 US$ por organizaciones regionales de agricultores.

Los temas principales de la investigación del aguacate son:

1) Mejoramiento del cultivo y cultivares más productivos.

2) Mejores selecciones de portainjertos.

3) Mejoramiento de producción por medio de reguladores de crecimiento de plantas.

4) Polinización, polinizador y polinizadores.

5) Combinación del riego y fertilización ("Fertirrigación")

6) Fisiología postcosecha, patología y tecnología.

7) Control de plagas biológicas.

El personal de extensión está compuesto por un equipo de 9 Agentes de Extensión regionales especializados en cultivos de frutas subtropicales y guiados por un coordinador profesional a nivel nacional. Además de sus actividades de extensión, participan en experimentos de campo y contribuyen al inventario de conocimientos en la producción de aguacate. Son asistidos por otros extensionistas que cubren otros campos como la protección de cultivos, el “servicio de campo” (por ejemplo, el riego y fertilización de cultivos), maquinaria agrícola, economía agrícola, etc. Estos otros agentes de extensión están ubicados en la misma región o trabajan a nivel nacional.

En la tercera década de este siglo, solo había pocos árboles de aguacate en Palestina. El cultivo del aguacate creció muy lentamente durante la cuarta y quinta década, pero durante los últimos 12 años, las plantaciones han aumentado a un ritmo más rápido. Ahora hay más de 2.000 acres de aguacate en el estado de Israel. Desde 1964, la plantación de aguacates está sujeta a la aprobación de la Junta de Comercialización de Frutas y está limitada a un total de aproximadamente 200 acres por año.

EL CLIMA

El clima de ciertas regiones en Israel es sumamente apropiado para el cultivo de frutas. El índice de heladas radiactivas en estas zonas es de algún modo menor que en el Sur de California. El uso de calefactores y de máquinas de viento no está justificado, aunque la inversión de temperatura en las noches despejadas es muy pronunciada. En la siguiente tabla, se muestra una comparación entre las temperaturas mínimas y máximas mensuales de una zona típica de aguacate en Israel (Acre) y San Diego (en grados Fahrenheit).

	San Diego*		Acre**	
	1875-1930		1940-1949	
Mes	**Prom Min.**	**Prom Max.**	**Prom**	**Prom**
Enero	46,6	62,4	49	65
Febrero	47,9	62,9	48	66
Marzo	49,8	63,8	50	68
Abril	52,5	65,1	54	73
Mayo	55,7	66,2	61	79
Junio	58,8	69,2	67	82
Julio	62,4	72,4	71	86
Agosto	63,7	73,9	72	88
Septiembre	61,4	73,0	69	85
Octubre	56,7	70,4	63	83
Noviembre	51,7	68,2	58	78
Diciembre	48,2	64,5	52	68

*Departamento de Comercio de los Estados Unidos

**El Servicio Meteorológico de Israel 1952

La mayoría de los huertos en Israel se localizan en la llanura costera ondulada. Dos olas de frío en el invierno de 1963-1964 causaron varios daños a los huertos de aguacates, lo que nos enseñó de manera difícil a evitar las zonas bajas propensas a los daños por heladas. Sin embargo, la recuperación en la siguiente primavera fue demasiado rápida. En 1950 se experimentaron temperaturas muy bajas en historias recientes, pero la cultura del aguacate todavía estaba en sus comienzos.

En años recientes, se inició una nueva zona para la cultura del aguacate en el alto Valle de Jordán. Se ha descubierto que una estrecha franja de tierra en la base de las colinas (cinturón térmico) está suficientemente libre de heladas perjudiciales para adaptarse a los aguacates. Otra región bastante adecuada para los aguacates se encuentra en las orillas del Lago de Tiberíades, a 650 pies por debajo del nivel del mar. Sin embargo, el riego de agua es generalmente muy salado en esta zona para los aguacates.

SUELOS

Los aguacates son adaptables a un Amplio rango de suelos. Sin embargo, los mejores suelos para los aguacates son de textura media y drenar rápidamente el exceso de humedad. Los árboles jóvenes de aguacates pueden volverse cloróticos en suelos arenosos. En suelos pesado mal drenados, los aguacates a veces pueden decaer debido a una pudrición de la raíz que no es causada por *Phytophthora cinnamomi,* de la cual no ha sido encontrada en Israel. Los suelos adecuados para los aguacates deben tener más del 7 % de espacio poroso no capilar y no debe haber ninguna tabla de agua encaramada, ni siquiera por un corto periodo, en las capas ocupadas por las raíces. Estamos a punto de introducir el ODR (Tasa de Difusión de Oxígeno en inglés) como criterio para la elección de los suelos para los aguacates.

Los aguacates son bastante resistentes a la cal (similar a los cítricos). Desafortunadamente, no hay posibilidad de evaluar de antemano la influencia de la cal en el rigor de la clorosis. La clorosis inducida por la cal y también el amarillamiento del follaje en suelos ligeros se han tratado con éxito con el Quelato 138 (referencias 1 y 2).

LLUVIAS Y RIEGOS

La lluvia en Israel está limitada a los meses de invierno, comenzando normalmente en octubre y terminando en abril. El promedio de lluvias en la llanura costera es de 20-24 pulgadas, siendo menos en el Valle de Jordán. Obviamente, se debe recurrir al riego durante el resto del año. Incluso en invierno, cada vez que hay un período de sequía, se deben regar los árboles de aguacates.

Los aguacates tienen raíces muy superficiales; al menos el 80 % de sus raíces generalmente se encuentran en los primeros dos pies de profundidad. Por lo tanto, se indican aplicaciones frecuentes y pequeñas. Estas se realizan a mediados de verano a intervalos de aproximadamente 10-14 días y se aplican alrededor de 1,5-

2 pulgadas de agua por acre en cada riego, lo que totaliza aproximadamente 40 pulgadas de agua por acre anualmente. Se realiza una aplicación más intensa en cada tercer riego para filtrar las sales acumuladas más allá de la zona de raíces.

Casi todos los huertos de aguacates (al igual que la mayoría de otras plantaciones en Israel) se riegan por rociador, siendo el método habitual el riego por rociador bajo la cabeza a un ángulo de 4,7 grados desde la horizontal. Los aguacates suelen injertarse en portainjertos mexicanos, y en ese portainjerto, los aguacates son la fruta más sensible a la sal en Israel. En comparación con el riego de agua utilizado en el Sur de California, la mayoría de las fuentes de agua en Israel tienen una proporción relativamente alta de cloro y, bajo nuestras condiciones, está justificado utilizar el contenido de cloro como criterio para juzgar la calidad del agua, y se consideran 120 mg por litro de cloro (aproximadamente 3,5 M.E.) como el límite superior. Sin embargo, algunos huertos de aguacates muy buenos se riegan en suelos bien drenados con agua que contiene 170-180 mg de cloro por litro (5 M.E.).

Se está realizando un considerable trabajo de investigación con variedades de aguacates del oeste indio resistentes a la sal como portainjertos. Sin embargo, el grado de resistencia a la sal dentro de la población de plántulas de un solo árbol es altamente variable. Los aguacates del oeste indio se están propagando por esquejes con el fin de obtener un clon homogéneo. Esto aún no se ha utilizado comercialmente. Hay algunas plantaciones bastante satisfactorias en portainjertos del oeste indio no identificados. Se han probado plántulas de Fuerte, Duke y Nabal como portainjertos (referencia 3), pero no han encontrado aceptación en la industria (son altamente sensibles a la cal).

PROPAGACIÓN

Hasta hace unos ocho años, los aguacates se propagaban casi exclusivamente mediante el injerto de plántulas mexicanas en el vivero (referencia 4). Los injertos se plantaban en primavera 21/2 después de sembrar la semilla en el vivero.

En la actualidad, las semillas se siembran en contenedores en otoño y las plántulas jóvenes se injertan por la punta o el lateral unas pocas semanas después de brotar. Están listas para ser plantadas en su lugar en otoño o en primavera, es decir, 12 a 18 meses después de sembrar la semilla en el vivero. Por lo general, se prefiere la siembra en otoño (septiembre) porque permite que la planta joven desarrolle raíces antes del inicio del crecimiento en la parte superior en primavera. Preferimos esto a la siembra en primavera, aunque tengamos que proteger la planta joven de las heladas poco después de la siembra.

PLANTACIONES MIXTAS

Generalmente, y por diversas razones, desalentamos la interplantación de dos o más tipos de árboles frutales. No obstante, se ha descubierto que los aguacates se desarrollan mejor cuando se plantan junto a una plantación de plátanos ya existente o en crecimiento (las plantas jóvenes de café en Centroamérica les va bien cuando crecen en la sombra de las plantas de plátano). La plantación de plátanos y aguacates juntos proporciona al agricultor ingresos antes de que los aguacates comiencen a dar fruto (el cuarto año después de la siembra). El precio de establecer un huerto de aguacates (que es de unos $1600 por acre) puede reducirse a la mitad de esta manera.

La distancia de siembra habitual es de 21 x 21 pies (6x6 m), que son 112 árboles por acre. A veces, la distancia de siembra es más amplia, de 21 x 26 pies (6x7,5 m). El objetivo es disminuir el huerto después de que los árboles comiencen a apiñarse entre sí cuando tienen entre 8 y 12 años. De hecho, muy pocos huertos se han disminuido según lo planeado. La siembra cercana asegura cosechas más abundantes durante la etapa inicial de producción y reduce el daño causado por el viento y el costo del control de malezas.

VARIEDADES

Se han introducido muchas variedades de California en Israel. Como resultado, la elección de variedades comerciales se asemeja a la de California. El Ettinger es

la única selección local que se ha destacado. En la mayoría de las plantaciones más recientes en Israel, no hay más de cinco variedades. En un futuro cercano, este número se reducirá en ciertas áreas a tres. Aquí se presenta una breve descripción de nuestras variedades estándar en orden de maduración:

1. *Ettinger:* Esta variedad mexicana se cosecha desde mediados de octubre hasta diciembre. La fruta se asemeja ligeramente a la del Fuerte, pero no alcanza su calidad. Es la variedad más resistente al frío y al viento que se cultiva comercialmente en Israel. El árbol es muy vigoroso y erguido; al igual que el Fuerte, tiende a producir a veces frutas sin semillas ("aguacate dátil"). Es un portador abundante y en muchos huertos ha sido la variedad más rentable. Estamos tratando ahora de limitar sus plantaciones para asegurar un suministro más uniforme de aguacates a lo largo de la temporada. Tiene una temporada de recolección óptima bastante corta.

2. *Fuerte:* Desde el punto de vista de los consumidores, el Fuerte también es la variedad ideal en Israel. Sin embargo, tiene algunas desventajas: En muchos huertos, no produce de manera satisfactoria y a veces sufre de no suavizarse completamente. Se ha encontrado que existe una alta correlación entre bajos rendimientos y falta de suavizamiento. Otro factor que contribuye es la recolección tardía (referencia 5 y 6). Por lo tanto, los árboles de bajo rendimiento deben ser cosechados temprano. La temporada de maduración se extiende desde noviembre hasta marzo. Debido a la selección de madera de yema de árboles consistentemente productivos, el Fuerte ha sido más productivo en la mayoría de las plantaciones más recientes. La recomendación actual para futuras plantaciones incluye un alto porcentaje del Fuerte (al menos dos tercios).

3. *Nabal:* Esta variedad guatemalteca tiene una mayor tendencia a la producción alternativa que otras variedades comerciales, pero es una buena productora. Su fruta generalmente es más grande de lo óptimo. En zonas ventosas (todos los distritos del interior a la costa norte), es muy propensa a caerse cuando está casi madura y a presentar cicatrices por el viento. Es la variedad más sensible a las heladas que se cultiva. Su temporada de recolección es de febrero a abril.

4. *Benik:* Esta variedad crece en algunas dimensiones para la polinización cruzada del Nabal.

5. *Hass:* Esta es la única variedad que se ha añadido en los últimos años a la lista recomendada. Es una productora abundante. La fruta tiende a ser pequeña y puede justificarse el aclareo manual en algunos casos. Algunos árboles que producen una cosecha abundante no tienen suficiente follaje para proteger la fruta del daño causado por el sol. El Hass se transporta bien a mercados distantes y supera incluso al Fuerte en calidad, pero su conocida desventaja es su superficie negra y rugosa. Alcanza una buena calidad para el consumo antes de enero, pero su temporada de comercialización puede extenderse hasta mayo. Por lo demás, el grado en que esta excelente variedad debe plantarse es un tema debatible.

ALGUNOS PROBLEMAS DE GESTION

Los árboles jóvenes de aguacate necesitan cierta protección contra los rayos directos del sol y contra el viento. Este último es muy importante durante los meses de invierno en su primer año. Los aguacates que crecieron en plantaciones de plátanos no necesitan tal protección.

Algunas de las variedades verticales (especialmente el Ettinger y el Nabal) tienen su crecimiento terminal reducido de vez en cuando para producir un árbol más extendido. Esto se hace varias veces durante cada una de las tres o cuatro primeras temporadas de crecimiento. Aquí, algunos granjeros están doblando las ramas y atándolas en lugar de cortarlas. Logran el mismo resultado de un árbol más extendido.

La necesidad de la polinización cruzada aún no ha sido demostrada experimentalmente, aunque hay evidencia observacional a su favor. Las variedades del Nabal y el Benik se cultivan juntas con ese propósito y algunos afirman que es ventajoso cultivar el Fuerte y el Hass uno al lado del otro.

Hay un porcentaje anormalmente alto de “aguacates datil” con el Fuerte y el Ettinger este año (1965), que estamos tratando de relacionar con condiciones climáticas adversas durante la temporada de floración. La falta de humedad disponible durante la temporada de floración puede reducir considerablemente la formación de frutos.

Debido al hábito de enraizamiento superficial del aguacate, cualquier tipo de cultivación puede dañar el sistema de raíces. Por lo tanto, los huertos de aguacates se mantienen bajo un sistema de no cultivación. Las viejas arboledas son lo suficientemente densas como para evitar que crezcan las malezas. A menudo se encuentran raíces en el suelo superior.

El nitrógeno es el único elemento aplicado en la mayoría de las arboledas de aguacates. También es costumbre agregar pequeñas cantidades de abono orgánico. Las aplicaciones abundantes de estiércol de pollo han causado ciertas deficiencias, como la de hierro y zinc, así como quemaduras marginales en las hojas. Se han estudiado análisis de hojas de aguacates (referencia 7 y 8).

RENDIMIENTO

En comparación con los cítricos, los aguacates son intrínsecamente un cultivo de bajo rendimiento. Parece que cualquier árbol frutal que produce un cultivo que contiene aceite como material elaborado (en contraste con los azúcares) está limitado en su capacidad de rendimiento. Además, los aguacates pueden producir hasta 10.000 flores por una sola fruta y esta floración abundante puede ser un mayor agotamiento de las reservas del árbol que el propio cultivo. Algunos de estos árboles con floración abundante pueden perder todo su follaje durante la temporada de floración (una situación similar ocurre con los árboles de algarrobo macho que florecen profusamente). Hasta donde sabemos, nadie ha intentado limitar esta floración excesiva.

Como resultado de los factores mencionados anteriormente, se considera un rendimiento promedio anual de tres y medio a cuatro toneladas por acre como promedio aceptable. Sin embargo, hay huertos en Israel que promedian seis

toneladas por acre. Creemos que la mayoría de los huertos bajo una buena gestión y condiciones ambientales deberían ser capaces de mantener ese nivel de producción promedio.

Existen bastantes huertos plantados en suelos demasiado pesados o demasiado ligeros que nunca producirán cosechas satisfactorias. Se estima que alrededor de un tercio de todos los huertos podrían volverse marginales tan pronto como los precios caigan por debajo del nivel actual de 15 a 20 centavos por libra.

MARKETING

Todos los aguacates en Israel se envían actualmente a tres empaquetadoras, donde la fruta apta para la exportación se empaca para su envío al extranjero y el resto de la fruta se vende localmente. Dado que la mayoría de las plantaciones son jóvenes, el rendimiento total aún no ha alcanzado las 2000 toneladas.

Se ha realizado algunos trabajos de investigación sobre el almacenamiento de aguacates (referencia 9 y 10).

PLAGAS Y ENFERMEDADES

a. *Virus Sunblotch:* Aparentemente, esta enfermedad ha sido traída a Israel por una de las introducciones más recientes del aguacate. Debido a la selección de árboles madre como fuentes de madera de yema, se espera que la incidencia de esta enfermedad en las nuevas plantaciones sea insignificante.

b. *Marchitez repentinot:* Los árboles en suelos pesados algunas veces son sujetos de una marchitez repentina que parece a la marchitez por Verticillium en

California. El agente causal todavía no ha sido encontrado. Los árboles algunas veces se recuperan por hacer crecer las ramas del andamio.

c. *Podredumbre:* Ciertas variedades (especialmente el Anaheim) son propensas a la podredumbre, que puede ser causada por varios hongos. Al recolectar aguacates, se ha sugerido que se deje sobresalir medio centímetro del tallo de la fruta.

Las otras plagas y enfermedades no son de general importancia. Las arboledas de aguacates no son rociadas para no alterar el equilibrio biológico.

FUTURAS PERSPECTIVAS

Las perspectivas para la cultura del aguacate en Israel están estrictamente limitadas por la naturaleza (la calidad del riego de agua, topoclima y macroclima, suelos). Debido a estos factores limitantes, no se espera que los aguacates aumenten en superficie en los próximos cinco o seis años en más de 1000 acres.

El mercado europeo puede incorporar entre la mitad y dos tercios de la cosecha. Se sugiere que los países que suministran para Europa con este nuevo fruto deberían unirse y planificar y financiar un programa conjunto de promoción.

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Chapter V

Data Analysis

The analysis of a project is an important pillar during investigation research in order to deeply understand what the researcher has done during the investigation. In Chapter V, it will discuss the data analysis of the work done above, following what the researcher has been working on the last months, checking back, and exploring data about the translated text. It will also implement the instruments already discussed in Chapter III (Text analysis, color-coding analysis, and the glossary).

5.1 Analysis and interpretation of the results

The work presents the next analysis which are the text analysis, the color-coding of the text; highlighting the different translation procedures proposed by many translation experts, and the glossary of difficult words and phrases within the text.

5.1.1 Text Analysis.

Text Analysis Element	The Avocado Industry in Israel	Política Pública del Sector Agropecuario Costarricense 2023-2032
Text Style	Description	Description
Text Function	Informative	Informative
Type of Translation	Communicative/Semantic	Communicative/Semantic
Scale of Formality	Formal	Formal
Scale of Emotional Tone	Factual	Factual
Scale of Generality	Technical	Technical

Table 4. Completed text analysis of the translated document

i. Color Coding.

Procedure	Example	Explanation
Transposition	Transposition	Highlighted in yellow
Modulation	Modulation	Highlighted in blue
Omission	Omission	Underlined in the ST
Amplification	Amplification	Highlighted in red
Explicitation	Explicitation	Highlighted in pink
Literal Translation	Literal Translation	Green Font
Punctuation Changes.	Punctuation Changes	Red font

Table 5. Color-coding used in the following paragraphs

5.1.2.1 Política Pública del Sector Agropecuario Costarricense 2023-2032

Spanish to English

Paragraph 1

Este documento parte de un análisis de situación del sector tanto productivo como institucional, donde se identifican los principales desafíos y retos que se enfrentan, los cuales serán atendidos mediante ejes estratégicos, con sus respectivas líneas y acciones puntuales en los próximos 10 años.
La elaboración del Plan Sectorial para operativizar la política, será liderada desde la rectoría con el apoyo de la Secretaría Ejecutiva de Planificación Sectorial (SEPSA), en la cual se definirán las intervenciones, responsables, plazos, indicadores de seguimiento y presupuestos, para cada uno de los ejes.

This document starts with an analysis of the situation in both productive and institutional aspects of the sector, identifying the main challenges and issues to be addressed. These will be tackled through strategic axes, each with its respective lines of action over the next 10 years.

The development of the Sectoral Plan to operate the policy, it will be led by the leadership with the support of the Executive Secretariat for Agricultural Sectoral Planning (SEPSA) This plan will define the interventions, responsible parties, deadlines, monitoring indicators, and budgets for each of the strategic axes.

Paragraph 2

La construcción de la Política incluyó la participación de las instituciones del Sector Agropecuario, la academia y el sector productivo, este proceso fue liderado por la Secretaría Ejecutiva de Planificación Sectorial Agropecuaria (Sepsa), que también contó con el apoyo de cooperación técnica por parte del Banco Interamericano de Desarrollo (BID), mediante un proceso participativo que generó el "Diseño Estratégico de la Política Pública para el Sector Agropecuario Pesquero y Rural", documento utilizado como insumo para la elaboración de la Política Pública para el Sector Agropecuario Costarricense 2023-2032.

The development of this policy included the participation of institutions within the Agricultural Sector, the academy, and the productive sector. This process was led by SEPSA, which also received technical cooperation support from the Inter-American Development Bank (IDB). Through a participatory process, this effort resulted in the "Strategic Design of the Public Policy for the Agricultural, Fisheries, and Rural Sector," a document used as input for the creation of the Public Policy for the Costa Rican Agricultural Sector 2023-2032.

Paragraph 3

En el ámbito internacional, en las últimas tres décadas Costa Rica ha adquirido compromisos multilaterales, así como acuerdos comerciales que el país debe honrar. Entre los compromisos de mayor relevancia se pueden citar la incorporación a los siguientes organismos internacionales: Organización Mundial del Comercio (OMC), la Organización para la Cooperación y el Desarrollo Económico (OCDE), la Convención Internacional de Protección Fitosanitaria (CIPF), la Organización Mundial de Sanidad Animal (OIE), así como la suscripción de la Convención Marco de Naciones Unidas sobre Cambio Climático, el Código de Conducta para la Pesca Responsable, y los Objetivos de Desarrollo Sostenible (ODS).

On the international stage, over the past three decades, Costa Rica has undertaken multilateral commitments and entered into trade agreements that the county must honor. Some of the most relevant commitments include accession to the following international organizations: the World Trade Organization (WTO), the Organization for Economic Co-operation and Development (OECD), the International Plant Protection Convention (IPPC), the World Organization for Animal Health (OIE), as well as the signing of the United Nations Framework Convention on Climate Change, the Code of Conduct Responsible Fisheries, and the Sustainable Development Goals (SDGs).

Paragraph 4

Otro compromiso que tiene el país está relacionado con el Consenso de Montevideo sobre Población y Desarrollo (CdM), particularmente en la Política Pública para el Sector Agropecuario Costarricense 2023-2032 en su eje de Productividad y Sostenibilidad, se vinculan acciones con la medida A de dicho consenso, que se refiere a la integración plena

de la población y su dinámica en el desarrollo sostenible con igualdad y respeto de los derechos humanos, específicamente en los siguientes acuerdos: 5) Buscar el desarrollo sostenible como medio de asegurar el bienestar humano equitativamente compartido por todos los pueblos hoy y en el futuro, garantizando que las interrelaciones entre la población, los recursos, el medio ambiente y el desarrollo sean plenamente reconocidas, convenientemente administradas y establecidas en un equilibrio armonioso y dinámico con la salud de la biodiversidad y los ecosistemas; y 6) Garantizar un patrón de producción y consumo sostenibles y evitar el agravamiento de los cambios climáticos indeseados provocados por las actividades antrópicas.

Another commitment the country has is related to the Montevideo Consensus on Population and Development, particularly in the Public Policy for the Costa Rican Agricultural Sector 2023-2032 within its Productivity and Sustainability axis, actions are linked with Measure A of the consensus. This measure focuses on the full integration of the population and its dynamics into sustainable development with equality and respect for human rights. Specifically, the following agreements are relevant: 5) To pursue sustainable development as a means to ensure human well-being equitably shared by all peoples today and in the future, guaranteeing that the interrelationships between population, resources, the environment, and development are fully recognized, suitably managed, and established in a harmonious and Dynamic balance with biodiversity health and ecosystems. 6) To ensure a pattern of sustainable production and consumption and to avoid the exacerbation of undesirable climate changes caused by human activities

Paragraph 5

Política de Estado para el Desarrollo Rural Territorial (PEDRT) 2015-2030, cuyo objetivo general es: Fomentar el desarrollo inclusivo de los territorios rurales, reconociendo y respetando sus características propias y la identidad cultural de su población, por medio de un sistema de articulación público privado, que reduzca las desigualdades e inequidades económicas, sociales, culturales, ambientales y político-institucionales, mediante el desarrollo de capacidades y oportunidades para sus habitantes.

The Policy for State Development in Rural Areas (PEDRT) 2015-2030, Whose general objective is: To promote inclusive development in rural territories, recognizing and respecting their own characteristics and the cultural identity of their population, through a system of public-private coordination that reduces economic, social, cultural, environmental, and political-institutional inequalities and inequities by developing capacities and opportunities for their inhabitants.

Paragraph 6

Después de la crisis económica de la década de los años ochenta, el país generó cambios en su modelo de desarrollo, el cual se ha caracterizado por ampliar la incorporación de la economía costarricense al mercado internacional, mediante la promoción y diversificación de las exportaciones, así como la atracción de la inversión extranjera directa. Sin embargo,

a pesar de los beneficios de este modelo de apertura comercial, el sistema económico generó una dualidad productiva, por un lado, un sector productivo dinámico y vinculado a cadenas globales de valor, y, por otra parte, una estructura productiva dedicada al mercado interno con poco encadenamiento y dispersión de las instituciones llamadas a su fomento, asimismo, los programas de apoyo se han visto reducidos producto de la contracción del gasto para controlar el déficit fiscal.

After the economic crisis in the 80's, the country started changes in its development model, characterized by expanding the integration of the Costa Rican economy into the international market. This was achieved through the promotion and diversification of exports, as well as the attraction of foreign direct investment. However, despite the benefits of this model of trade openness, the economic system has created a productive duality. On one hand, there is a dynamic sector linked to global value chains, and on the other, a production structure dedicated to the domestic market with limited linkages and dispersion of the institutions responsible for its promotion. Additionally, support programs have been reduced due to fiscal deficit control measures.

Paragraph 7

Desde el punto de vista económico, las principales actividades agropecuarias, tanto las orientadas al mercado externo como interno, enfrentan importantes desafíos relacionados con el mejoramiento de su productividad y competitividad ante la existencia de mercados cada vez más exigentes, el ajustar sus técnicas productivas a las nuevas tecnologías de producción y procesamiento. Se requiere identificar y aprovechar nichos de mercado a nivel nacional e internacional para mejorar el posicionamiento de productos tradicionales e incluir nuevos productos en mercados emergentes, generando a su vez sinergias que permitan ampliar los beneficios a las zonas rurales.

From an economic point of view, the main agricultural activities, whether oriented towards domestic or international markets, face significant challenges related to improving their productivity and competitiveness in the face of increasingly demanding markets. They need to adapt their production and processing techniques to new technologies.

It is necessary to identify and capitalize on market niches at both the national and international levels to enhance the positioning of traditional products and introduce new products in emerging markets. This can also create synergies that expand the benefits to rural areas.

Paragraph 8

La diversificación de la oferta y el incremento de su productividad y competitividad tiene además una finalidad social: garantizar la existencia de bienes y servicios en los mercados y con ello contribuir a una adecuada alimentación y nutrición de la población. El sector público juega un papel importante en el aumento de la productividad, por medio de la investigación de nuevas ofertas tecnológicas, variedades resilientes, agricultura de precisión y transferencia de servicios de extensión que le permitan al productor por medio

de un aumento de su productividad, ser competitivo. Otros aspectos clave para generar el incremento en la productividad se refieren a: la disponibilidad de información para la toma de decisiones, la infraestructura, manejo de datos y acceso al financiamiento, entre otros.

The diversification of the supply and increasing its productivity and competitiveness also serves a social purpose: ensuring the availability of goods and services in the markets and thereby contributing to adequate food and nutrition for the population. The public sector plays an important role in increasing productivity though research into new technological offerings, resilient varieties, precision agriculture, and extension services that allow the producer to be competitive by increasing their productivity. Other key aspects for generating increased productivity include: the availability of information for decision-making, infrastructure, data management, and access to financing, among others.

Paragraph 8

Las instituciones del Sector Agropecuario no han podido responder con la celeridad necesaria a los cambios en la actividad agropecuaria producto de los avances tecnológicos, ni mucho menos han podido reaccionar oportunamente para asistir al productor ante las aperturas comerciales aprobadas desde años atrás, esto ha afectado a las personas productoras principalmente por:

I. Una reducida inversión pública, incapaz de generar el impacto suficiente para el desarrollo del Sector.
II. Deficiente capacitación de los funcionarios, que impiden abocarse de manera efectiva al servicio de las personas productoras.
III. Recambio generacional en el personal de las instituciones públicas poco efectivo.

IV. Falta de armonía o coordinación efectiva de las instituciones del sector, que duplican procesos y destinan recursos sin una planificación por objetivos clara.

The institutions in the Agricultural Sector have not been able to respond with the necessary speed to the changes in agricultural activities due to technological advances, and they have not been able to react promptly to assist producers in light of trade liberalization measures approved years ago. This has mainly affected producers due to:

IV. A limited public investment that is incapable of generating sufficient impact for the Sector's development.

V. Inadequate training of officials, preventing them from effectively serving the needs of producers.

VI. An ineffective generational turnover within the public institutions.

VII. A lack of harmony or effective coordination among sector institutions, leading to duplicated processes and the allocation of resources without clear objective-based planning.

Paragraph 9

El mercado ha evolucionado, debido a que ahora no solamente requiere de productos de calidad, sino que adicionalmente demanda producción sostenible, libre de deforestación, productos orgánicos, productos con baja carga química, sumado a esto, se deben realizar modificaciones en los sistemas productivos para incorporar acciones de mitigación y adaptación al cambio climático. Las transacciones en los mercados internacionales priorizarán aquellos bienes producidos bajo sistemas de manejo sostenible, por encima de barreras arancelarias, razón por la cual, las instituciones del Sector Agropecuario deben estar preparadas para estos avances y no dejar a ningún productor atrás.

The market has evolved, as it now requires not only high-quality products but also demands sustainable production, free from deforestation, organic products, and products with low chemical inputs. In addition, modifications in production systems are required to incorporate measures for mitigating and adapting to climate change. Transactions in international markets will prioritize goods produced under sustainable management systems over tariff barriers. Therefore, the institutions within the agricultural sector must be prepared for these developments and ensure that no producers are left behind

Paragraph 10

El país está experimentando un proceso de cambio demográfico, manifestado en la progresiva disminución de la población rural; mientras la población total en las últimas décadas crece a 1,4% acumulativo anual, la población rural decrece a una tasa de 1,3%. En el Sector Agropecuario, se aprecia un progresivo aumento de la edad promedio de la población ocupada, en gran medida relacionada con la existencia de un importante flujo migratorio de población joven del medio rural, que no está encontrando oportunidades atractivas en el Sector. Esta incapacidad del Sector de mantener la población joven es determinante para el desarrollo del Sector; pues son precisamente ellos quienes cuentan con mayor formación y potenciales habilidades para incorporar las nuevas tecnologías, y constituirse en agentes de cambio para modernizar y diversificar la producción rural.

The country is experiencing a demographic shift characterized by a gradual decrease in the rural population. While the total population has been growing at a cumulative annual rate of 1.4% in recent decades, the rural population has been declining at a rate of 1.3%. In the agricultural sector, there is a noticeable increase in the average age of the occupied population, largely due to a significant migration of young people from rural areas who are not finding attractive opportunities in the sector. The sector's inability to retain a young population is crucial for its development because it is precisely these young individuals who have greater education and potential skills to incorporate new technologies and become agents of change to modernize and diversify rural production.

Paragraph 11

• Desarrollo Sostenible: La definición original de la Comisión Mundial sobre el Medio Ambiente y el Desarrollo la cual indica: "El desarrollo sostenible es aquel que satisface las

necesidades del presente sin comprometer la capacidad de las futuras generaciones de satisfacer sus propias necesidades". Este concepto considera que este tipo de desarrollo comprende tres dimensiones: la económica, ambiental y social.

• Derechos humanos: Marco conceptual que orienta la promoción de procesos de desarrollo humano y se basa en las normas internacionales.

• Derecho inclusivo: Este enfoque pone especial énfasis en una visión de desarrollo que no excluya, todo lo contrario, que integre y sume a todos los actores sociales. Este enfoque aplica una estrategia que pone en el centro el desarrollo social, la reducción de brechas de desigualdad y la contribución a la reducción de las vulnerabilidades estructurales.

○ *Sustainable development*: The original definition by the World Commission on Environment and Development states, *"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."* This concept recognizes that such development encompasses three dimensions: economic, environmental, and social.

• *Human Rights*: A conceptual framework that guides the promotion of human development processes and is based on international standards.

• *Inclusive Right*: This approach places special emphasis on a development vision that does not exclude but, on the contrary, integrates and involves all social stakeholders. This approach applies a strategy that places social development at its core, reduces inequality gaps, and contributes to the reduction of structural vulnerabilities.

Paragraph 12

• Sostenibilidad Multidimensional: El Sector Agropecuario dirigirá sus esfuerzos al uso y utilización eficiente de los recursos, procurar la satisfacción de las necesidades de las personas productoras sin comprometer las opciones de las generaciones futuras y garantizar un mejor posicionamiento en los mercados.

• Integralidad: El desarrollo del Sector Agropecuario requerirá de procesos de articulación y complementariedad de las intervenciones públicas a desarrollarse, tomando en cuenta los distintos sectores de la economía en los ámbitos nacional, regional, territorial y local.

• Solidaridad: Basada en la ayuda mutua entre los distintos actores que integran al Sector Agropecuario, que permitan alcanzar una vida digna para todas las personas.

• Multidimensional Sustainability: The Agricultural Sector will direct its efforts toward the efficient use and utilization of resources, ensuring the satisfaction of the needs of producers without compromising the options for future generations and guaranteeing a better position in the markets.

• Comprehensiveness: The development of the Agricultural Sector will require processes of coordination and complementarity of public interventions to be carried out,

taking into account the different sectors of the economy at the national, regional, territorial, and local levels.

• Solidarity: Based on mutual assistance among the various stakeholders that make up the Agricultural Sector, allowing for a dignified life for all individuals.

Paragraph 12

• Inclusión: Incorporar a las personas y grupos sociales sin distinción de ninguna naturaleza a los recursos y servicios brindados por el Sector Agropecuario.

• Responsabilidad social: Actuar en beneficio de la sociedad actual y futura mediante una oferta de bienes y servicios públicos oportunos y eficaces.

• Transparencia y rendición de cuentas: Seguimiento y evaluación de las acciones implementadas, en el cumplimiento de las intervenciones públicas establecidas en un clima de diálogo y articulación entre la institucionalidad pública y el sector privado.

• Inclusion: Incorporating individuals and social groups without distinction of any kind into the resources and services provided by the Agricultural Sector.

• Social Responsibility: Acting for the benefit of current and future society by providing timely and effective public goods and services.

• Transparency and Accountability: Monitoring and evaluating the actions implemented in compliance with the established public interventions in an atmosphere of dialogue and coordination between public institutions and the private sector.

Paragraph 13

El Sector Agropecuario está compuesto por una estructura institucional pública amplia y compleja, donde según sus competencias, se desarrollan las acciones para atender a las personas productoras, desde la producción primaria hasta la comercialización. A su vez, cuenta con una serie de mecanismos que posibilitan los procesos de planificación y coordinación entre sus instituciones. Pese a la existencia de estas instancias, en los últimos años la coordinación de la acción institucional se ha mostrado débil e insuficiente. El ejercicio de una Rectoría clara en el cumplimiento de los objetivos del Sector Agropecuario, orienta las capacidades de las instituciones involucradas, promoviendo la coordinación y la concertación de la acción institucional, lo cual trae como resultado un mayor impacto en la gestión pública y satisfacción en la persona productora.

The Agricultural Sector is comprised of a broad and complex public institutional structure, where institutions, according to their competencies, carry out actions to support producers, from primary production to marketing. It also has various mechanisms for planning and coordination among its institutions. Despite the existence of these bodies, coordination of institutional actions has been weak and insufficient in recent years. Exercising clear leadership in the fulfillment of the Agricultural Sector's objectives guides the capabilities of the involved institutions, promoting coordination and the agreement of institutional

cooperation, resulting in a greater impact in public management and satisfaction for the producer.

Paragraph 14

Esta línea va dirigida a mejorar las competencias y las habilidades laborales, tanto técnicas como blandas, del personal de las instituciones del Sector, con el fin de responder tanto al modelo institucional, competencial y funcional que se defina, así como a las necesidades del sector productivo. En este sentido, es necesario fortalecer las capacidades en prospección, planificación, seguimiento y evaluación de las distintas intervenciones públicas del Sector. Por ello, resulta necesario reforzar las capacidades institucionales para: avanzar hacia enfoques y actuaciones integrales y coordinadas, que orienten, con criterio estratégico, los esfuerzos en el Sector y su capacidad de vincular al sector privado y otros actores en el desarrollo del mismo.

This line aims to enhance the competencies and skills, both technical and soft, of the staff in the sector's institutions in order to respond to the institutional, competency, and functional model that is defined, as well as the needs of the productive sector. Therefore, it is necessary to strengthen the capacities in prospecting, planning, monitoring, and evaluating various public interventions in the sector. As a consequence, it is necessary to reinforce institutional capacities to move towards comprehensive and coordinated approaches that strategically guide efforts in the sector and its ability to engage the private sector and other stakeholders in its development.

Paragraph 15

En el ámbito de la ciencia, tecnología e innovación (CTI), se hace necesario la planificación a largo plazo y la coordinación desde el nivel político para impulsar la generación de tecnologías apropiadas que respondan a la demanda del sector y avanzar en aspectos relacionados con la biotecnología y desarrollar metodologías que permitan su aprovechamiento por parte de todas las personas productoras y empresas agroindustriales. El sistema de investigación debe estar preparado para absorber el nuevo conocimiento que esté disponible en el entorno internacional (TIC's; invernaderos inteligentes; agricultura de precisión; robotización, etc.) y generar el uso de ese conocimiento para concebir tecnologías adaptadas al entorno del Sector Agropecuario e impulsar su adopción mediante mecanismos eficaces y eficientes de extensión. Todo ello requiere impulsar cambios en la forma de establecer prioridades de investigación, para ello se debe enfatizar en temas vinculados con el negocio agropecuario y pesquero; tales como creación de valor agregado, cadenas de valor, calidad nutricional, producción de energía, aprovechamiento de la biomasa y otros.

In the field of science, technology, and innovation (STI), Long-term planning and coordination are necessary at the political level to promote the generation of appropriate technologies that meet the sector's demands and advance biotechnology aspects. It is also

important to develop methodologies that allow all producers and agribusinesses to harness these technologies.

The research system must be prepared to absorb new knowledge available internationally (such as ICT, Smart greenhouses, precision agriculture, robotics, etc.) and harness that knowledge to create technologies adapted to the agricultural sector's environment, and promote their adoption through efficient extension mechanisms. All of this requires a shift in research priorities, emphasizing topics related to agribusiness and fishing, such as value creation, value chains, nutritional quality, energy production, biomass utilization, and other areas.

5.1.2.2 The Avocado Industry in Israel

English to Spanish

Paragraph 1

Israel is located along the southern part of the eastern coast of the Mediterranean, between latitudes 30° and 33° North. Climate in the avocado-growing regions is subtropical: warm rainless summers and cool rainy winters. The rainy season is mainly from November through March. Annual precipitation varies from an average of 200mm in the south to 700mm in the northern coast. A major part of the avocado area in the country is along the coastal plain (see later), but notable growing area is located in the interior hot valleys.

Israel está ubicado a lo largo de la parte sur de la costa oriental del mar Mediterráneo, entre las latitudes 30° y 33° Norte. El clima en las regiones de cultivo del aguacate es subtropical, con veranos cálidos y secos e inviernos frescos y lluviosos. La época lluviosa se extiende principalmente de noviembre a marzo. Las precipitaciones anuales varían desde un promedio de 200 mm en el sur hasta 700 mm en la costa norte. Aunque la mayor parte de la plantación de aguacates en el país se encuentra junto a la llanura costera (ver más adelante), hay una notable área de crecimiento en el interior de valles calientes.

Paragraph 2

Table 1 summarizes the mean, maximum and minimum temperatures for each month in two locations: Bet Dagan, in the coastal plain, and Deganya Alef, in the hot Sea of Galilee Valley. Temperatures below 0°C are not common in the avocado-growing areas: Orchards have been planted considering the topography, and sites with frost hazard were avoided, particularly after the midseventies, in accordance with a nationwide topo-climatological survey implemented by the Meteorological Service of Israel. However, temperatures in some avocado areas have dropped to - 2° - 4°C, and in some low pockets have fallen down to -7°C in certain years.

La Tabla 1 resume las temperaturas máximas y mínimas de cada mes en dos ubicaciones: Bet Dagan, en la llanura costera, y Degania, en el cálido valle del Mar de Galilea. Las temperaturas bajo cero no son comunes en las áreas de cultivo del aguacate. Se han

establecido huertos de árboles frutales considerando la topografía, y se evitan sitios propensos a heladas, especialmente desde mediados de la década de 1970, según una encuesta topoclimatológica a nivel nacional implementada por el Servicio Meteorológico de Israel. Sin embargo, en algunas áreas de cultivo de aguacates, las temperaturas han descendido entre -2°C y -4°C, y en casos particulares han llegado a -7°C en ciertos años.

Paragraph 3

Three-quarters of the total avocado areas in the country are planted on various types of Grumusols, heavy-textured soils containing 8-20% lime (CaCO3), with pH 7.8 - 8.2 and with fair internal drainage. In the coastal plain, some orchards are planted on loamy sends with no lime (pH 7-7.3) or, in the south-west, with 5-10% lime. In the Sea of Galilee Valley, some orchards are planted on very calcareous soils (40% CaCO3), with trees grafted on specific adaptable rootstocks (see para. "Rootstocks").

Se plantaron tres cuartas partes de las áreas totales de aguacate en el país en varios tipos de suelos, principalmente grumosoles, caracterizados por su textura pesada y un contenido de cal (CaCO3) de 8-20 %, con un pH de 7.8 a 8.2 y un drenaje interno aceptable. En la llanura costera, algunos huertos de árboles frutales son plantados en suelos francoarenosos sin cal (pH 7-7,3), mientras que en el suroeste se utilizan suelos con un contenido de cal del 5-10 %. En el valle del Mar de Galilea, algunos huertos de árboles frutales se establecen en suelos altamente calcáreos (40 % $CaCO_3$), con árboles injertados en portainjertos específicos y adaptables (ver párrafo “Portainjertos”).

Paragraph 4

Irrigation Water: All avocado orchards are regularly irrigated throughout the dry hot season. Most of the water in Israel is supplied by a state owned company, and allocated by the State Water Authority according to quotas linked to land tenure. Water is either pumped from underground reservoirs, containing 50-400 ppm Chlorine, or supplied from the National Water Carrier, starting at the Sea of Galilee, which contains 190-250 ppm CI. Water price is determined by the government (presently - 18 US cents per 1 m3).

Riego de agua: Todos los huertos de aguacates reciben riego regular durante la época cálida y seca. La mayor parte del agua en Israel es suministrada por una empresa pública y asignada por la autoridad estatal del agua de acuerdo con cuotas vinculadas a mandatos de tierra. El agua se bombea desde embalses subterráneos, con un contenido de cloro de 50 a 400 ppm, o se suministra a través del Acueducto Nacional, que se origina en el Mar de Galilea y contiene de 190 a 250 ppm de Cl. El gobierno determina el precio del agua (actualmente 18 centavos estadounidenses por 1 m^3).

Paragraph 5

The above regional yields have dropped in recent years, partly due to increasing salinity of the local irrigation water and also due to the decrease in average yields of 'Hass', a national phenomenon which has yet to be fully explained. The aforementioned is

demonstrated in table no 2. 70% of the total avocado area in the country is cultivated by Kibbutzim (cooperative settlements), 30-100 Ha each. The rest consist mainly of small family orchards of 1-3 Ha. Table no.2 represents an area of 1,500 Ha of orchards belonging to Kibbutzim. The data was provided with the courtesy of the "Miluot" regional packing house. Note: The table should not be misinterpreted: it does not represent national averages.

Las cosechas regionales mencionadas han disminuido en los años recientes, en parte debido al aumento de la salinidad en el riego de agua local y también a la disminución en la producción promedio de "Hass", un fenómeno nacional que aún debe ser explicado. Esto se demuestra en la Tabla 2. Los kibutz (asentamientos cooperativos) cultivaron el 70 % del área total de aguacates en el país, con tamaños de 30 a 100 ha. El resto consiste principalmente en familias pequeñas con huertos de árboles frutales de 1 a 3 ha. La Tabla 2 representa un área de 1500 ha de huertos frutales pertenecientes a los kibutz. Los datos fueron proporcionados con la cortesía de la empacadora regional "Miluot". Nota: La tabla no debe ser malinterpretada: no representa promedios nacionales.

Paragraph 6

1) Since 1982/83, growers experienced several successive seasons of poor return per ton, partly due to unfavorable exchange rates, particularly in the 1984/5 season. (See table no. 3).

2) The season of 1986/7, with an unprecedented bumper crop of 127,000 tons, was followed by a succession of several years with low yields. This resulted from a coincidence of extreme alternate offseason in 1987/8, followed by the disastrous 1988/9 season (85% crop failure due to a rare heat-wave), and this was followed by the severe freeze of Feb. 1989.

1) Desde 1982 hasta 1983, los agricultores experimentaron algunas temporadas consecutivas de malas tasas de cambio por tonelada, en parte debido a la tasa de cambio desfavorable, especialmente en las temporadas de 1984 y 1985 (ver Tabla 3).

2) La temporada de 1986 y 1987, con una cosecha abundante sin precedentes de 127,000 toneladas, fue seguida por una sucesión de varios años con cosechas escasas. Esto se debió a una coincidencia de alternancias fuera de temporada en 1987 y 1988, seguido por la desastrosa temporada de 1988 y 1989 (el 85 % de la cosecha fracasó debido a una rara ola de calor), seguida por la fuerte helada de febrero de 1989.

Paragraph 7

Table no. 3 demonstrates the downfalls in the Israeli avocado production. Since the late eighties, erratic and low crops have shaken the dominant position of Israel as the main stable supplier of avocado to the European markets. Meanwhile, the growing demand for avocado in those markets has attracted offers by other countries. All the above problems brought new planting practically to a standstill and induced a trend of neglect and uprooting

of avocado orchards. Presently, the planted area is estimated at 7,800 Ha of which 10% are new topgrafts, or new planting, which has resumed gradually in 1992, mainly by experienced growers.

La Tabla 3 muestra las caídas en la producción de aguacate en Israel. Desde finales de los ochenta, los cultivos irregulares y bajos han sacudido la posición dominante de Israel como el principal proveedor estable de aguacates en el mercado europeo. Mientras tanto, la creciente demanda de aguacates en esos mercados ha atraído ofertas de otros países. Todos los problemas anteriores prácticamente han paralizado las nuevas plantaciones y han causado una tendencia de negligencia y arranque de huertos de aguacate. Actualmente, las áreas plantadas son aproximadamente 7,800 ha, de las cuales el 10 % son injertos nuevos o plantaciones nuevas, que se han reanudado gradualmente desde 1992, principalmente por agricultores experimentados.

Paragraph 8

In 1970, with a total avocado area of 2,100 Ha, the percentage of the main cultivars was: 'Fuerte' - 43%, 'Ettinger' - 20%, 'Hass' - 17% and 'Nabal' - 10%. This proportion was based on the accumulated experience and on the preference of the export markets at that time. The recommendations on cultivars were set by the Subtropical Fruit Governing Board and by the Extension Service. The Board has guided the research and development of the avocado industry in the country from 1960 until 1989. It included representative from research, extension services, growers and the exporting body. The above proportion of cultivars has changed considerably during the last fifteen years, and in 1995 the situation is: 'Fuerte' - 25%, 'Ettinger' - 25%, 'Hass' - 30%, 'Nabal' - 4% and 'Reed' - 6% (Estimated)

En 1970, con un total de 2000 ha de zona de aguacates, el porcentaje de los cultivares principales era el siguiente: “Fuerte” – 43 %, “Ettinger” - 20 %, “Hass” - 17 %, y “Nabal” - 10 %. Esta distribución se basó en la experiencia acumulada y en las preferencias de los mercados de exportación de ese tiempo. Las recomendaciones sobre cultivares fueron establecidas por la Tabla del director de fruta subtropical y por el Servicio de Extensión. La Tabla ha guiado la investigación y el desarrollo de la industria del aguacate en el país desde 1960 hasta 1989, e incluye representantes de la investigación, servicios de extensión, agricultores y la organización exportadora. El porcentaje anterior de los cultivares ha cambiado considerablemente durante los últimos 50 años, y en 1995, la situación era la siguiente: “Fuerte” - 25 %, “Ettinger” - 25 %, “Hass” - 30 %, “Nabal” - 4 %, y “Reed” - 6 % (los valores son estimados).

Paragraph 9

'Fuerte': Apparently several clones were introduced to Israel, some of them not productive. The practice of girdling, applied in some orchards (mainly in the seventies) did not solve the problem of average low and erratic yields of this cultivar. Therefore, it lost its dominance in the orchards and was uprooted or top- worked to more productive cultivars in many orchards. This trend has recently slowed down in view of encouraging results of

Paclobutrazol applications in stabilizing its yields. The main harvest season is November through February.

'Fuerte': Aparentemente, se presentaron varios clones en Israel, algunos de los cuales no eran productivos. La práctica del anillado, aplicada en algunos huertos de árboles frutales (principalmente en los años setenta), no resolvió el problema del rendimiento irregular y bajo de este cultivar. Por lo tanto, perdió su dominio en los huertos de árboles frutales y fue arrancado de raíz o reemplazado por cultivares más productivos en muchos huertos. Esta tendencia se ha desacelerado recientemente debido a resultados alentadores con la aplicación de Paclobutrazol, que mejoró los rendimientos. La principal temporada de cosecha es de noviembre a febrero.

Paragraph 10

At that period, a large-scale field research on avocado rootstocks was initiated. In this unprecedented work, led by Dr A. Ben-Ya'akov, many new orchards were planted with a pre- arranged planting design of various rootstocks, without interfering with the original plan of cultivars in each orchard. A large group of avocado growers actively participated in this program; they collected yield data for every tree in their commercial orchard, which was a common practice in many orchards in the country until the mid eighties (and was aimed at thinning-out of less productive trees).

En ese periodo, se inició un campo de investigación en portainjerto de aguacates a gran escala. En este trabajo sin precedentes, liderado por la Dra. A. Ben-Ya'akov, muchos huertos de árboles frutales nuevos se plantaron con un diseño de plantación de varios portainjertos organizado de antemano, sin interferir con el plan original de cultivares en cada huerto. Un grupo grande de agricultores de aguacate participaron activamente en este programa; recopilaron datos de rendimiento por cada árbol de su huerto comercial, lo cual era una práctica común en muchos huertos de árboles frutales en el país hasta mediados de los ochenta (centrada en el aclareo de árboles menos productivos).

Paragraph 11

Results of the several experiments in avocado fertilization, carried out in Israel, were not sufficient, so far, to serve as a general guide for recommendations. Present practices in most of the orchards are based partly on results of leaf analysis, but more on local experience and observations, on tree vigor and crop load, and on consulting with the Extension staff or with a regional researcher. The present common practice is "Fertigation" along the whole irrigation season. In some orchards, pre-bloom application of N (1/4 of the annual dose) is practiced.

Hasta ahora, los resultados de varios experimentos en la fertilización del aguacate no han sido suficientes para servir como guía de recomendaciones generales en Israel. Las prácticas actuales en la mayoría de los huertos de árboles frutales se basan parcialmente en los resultados de análisis de hojas, pero más en experiencias y observaciones locales, en el vigor del árbol y la carga del cultivo, y en la consulta con el personal de extensión o

un investigador regional. La práctica común actual es la "fertirrigación" a lo largo de toda la temporada de riego. En algunos huertos de árboles frutales, se practica la aplicación de N (1/4 de la dosis anual) antes de la floración.

Paragraph 12

The common planting density of avocado in Israel, 270-410 trees/Ha (according to cultivar and growing conditions), was planned, in the past, for future thinning- out of trees. This practice was recommended at that time particularly for 'Fuerte' and 'Nabal'; the solution suggested for problems of crowding and shade in 'Hass' was pruning. However, growers were often late with carrying out the thinning, and pruning was light or limited to some topping. The above situation has recently changed and since the end of the eighties, annual hedging and topping (mechanical or manual) became the common practice for management of tree crowding instead of thinning-out of trees.

En el pasado, se planificó una densidad de plantación común para aguacates en Israel, de 270-410 árboles/ha (según las condiciones de cultivo y crecimiento) para futuros aclareos de árboles. Esta práctica se recomendó especialmente para el "Fuerte" y el "Nabal" en aquellos tiempos; la solución sugerida para los problemas de multitud y sombra en el "Hass" fue la poda. Sin embargo, los agricultores a menudo tardaban en llevar a cabo el aclareo, y la poda era ligera o limitada por algunos despuntes. Esta situación ha cambiado recientemente, y desde finales de los ochenta, la cobertura y los despuntes anuales (ya sea mecánicos o manuales) se han convertido en la práctica común de gestión de la multitud de árboles en lugar del aclareo de árboles.

Paragraph 13

Avocado in Israel is not greatly troubled by pests, probably due to several factors:

a) careful conservation of natural biological balance, owing to intensive research and extension, and strict practices of biological control.

b) Being a relatively new crop in a country remote from the centers of origin.

c) Strict quarantine measures taken during introduction of avocado propagation material, and ban on import of avocado fruits.

d) Events of extreme high and low temperatures that may have hindered the development of some avocado pests prevalent in the tropics**.**

Las plagas en el aguacate de Israel no son un gran problema, probablemente debido a distintos factores:

a) Conservación cuidadosa del equilibrio biológico natural, gracias a una investigación y extensión intensivas, así como a prácticas estrictas de control biológico.

b) Al ser un cultivo relativamente nuevo en un país distante de sus orígenes.

c) Se implementaron medidas de cuarentena estrictas durante la introducción de material de propagación del aguacate y la prohibición de importar frutos de aguacate.

d) Eventos de temperaturas extremadamente altas y bajas que podrían haber dificultado el desarrollo de algunas plagas de aguacates comunes en los trópicos.

Paragraph 14

The climate in Israel is unfavorable to development of diseases of fruit or canopy of avocado. Avocado Root-rot (Phytophthora cinnamomi) was first identified in Israel in 1982. It's spread has been limited, so far, to 40-50 Hectares only, mainly in moist spots of very heavy soils or other sites with poor drainage. Selection of local resistant or tolerant rootstocks is being carried out. Inflorescence Dieback may cause serious damage, in some years, mainly in 'Hass', by considerable reduction of yields of infected trees. The factor responsible for this phenomenon is still unknown.

El clima en Israel es desfavorable para el desarrollo de enfermedades en la fruta o el dosel del aguacate. La pudrición de la raíz del aguacate (*Phytophthora cinnamomi*) fue identificada por primera vez en Israel en 1982. Hasta ahora, su propagación se ha limitado a solo 40-50 ha, principalmente en áreas húmedas con suelos muy pesados u otros lugares con un drenaje pobre. Se está llevando a cabo la selección de portainjertos locales resistentes o tolerantes. En algunos años, principalmente en el "Hass", la necrosis descendente de las ramas en la inflorescencia puede causar graves daños al reducir considerablemente el rendimiento de los árboles infectados. El factor responsable de este fenómeno todavía es desconocido.

Paragraph 15

At the beginning of the season (generally in the last week of September) harvest starts in each region according to criteria of percentage of dry matter (representing oil content) for each cultivar. The above is determined after a repeated systematic sampling survey. Later, harvest continues according to a re-planned weekly program and allocation of quotas by the Corporation headquarters to each packing house. This is based on combined considerations of market demands, size of stocks, availability of produce from each location etc. Selective harvesting (by size) is common. Hundreds of Hydraulic Ladders ("Cherry Pickers"), produced in Israel, are used for picking in tall trees, up to 6.5m.

Al inicio de la temporada (generalmente en la última semana de septiembre), la cosecha inicia en cada zona según los criterios de porcentaje de materia seca (representando el contenido de aceite) por cada cultivar. Lo anterior se determina después de una repetida encuesta sistemática de muestreo. Luego, la cosecha continúa según un programa semanal replanificado y el reparto de cuotas por parte de la sede de la Corporación por cada empacadora. Esto se basa en consideraciones conjuntas de la demanda del mercado, tamaño de las existencias, disponibilidad de productos en cada ubicación, etc. La cosecha selectiva (por tamaño) es común. Se utilizan cientos de escaleras hidráulicas, producidas en Israel, para la recolección en árboles altos de hasta 6,5 metros de altura.

5.1.3 Glossary.

The Avocado Industry in Israel			
English Term	Spanish Term	Grammatical Category	Definition
Orchard	Huerto de árboles frutales	Noun	An area of land where fruit trees, excluding orange trees or other citrus trees, are grown.
Nationwide	De ámbito nacional	Adjective	Existing or happening in all parts of a particular country.
Crop	Cosecha/Cultivo	Noun	The total amount collected of a plant such as a grain, fruit, or vegetable grown in large amounts
Fruit-set	Cuajado	Noun	The process in which flowers become fruit and potential fruit size is determined.
Spells	Período	Noun	A short period of a particular type of weather.
Grumusol	Grumosol	Noun	A black soil, rich in calcium and magnesium, suitable for agriculture.
Lime	Cal	Noun	A white powdery substance used in cement.
Graft	Injertar	Verb	To take and put in place a graft, a technique whereby tissues of plants are joined so as to continue their growth together.
Rootstock	Portainjerto	Noun	A stem to which part of another plant is joined so that both parts can grow together and get an advantage from a good feature of the stem.

Yields	Rendimiento	Noun	An amount of something positive, such as food or profit, that is produced or supplied
Kibbutz	Kibutz	Noun	An intentional community in Israel that was traditionally base on agriculture.
Seedling	Plántula	Noun	A very young plant that has grown from a seed.
Pollinizer	Polinizador de planta.	Noun	A plant that provides pollen.
Girdling	Anillado	Noun	The technique that kills woody plants in place without cutting them down
Uproot	Arrancar de raíz	Verb	To pull a plant including its roots out of the ground.
Thinning	Aclareo	Noun	Term used in agricultural sciences to mean the removal of some plants, to make room for the growth of others.
Free On Board (F.O.B)	Franco a bordo	Noun	A shipment term that defines the point in the supply chain when a buyer or seller becomes liable for the goods being transported.
Cultivar	Cultivar	Noun	Group of plants artificially selected by different methods from a variable crop.

Política Pública para el Sector Agropecuario Costarricense 2023-2032			
Termino en español	Termino en inglés	Categoría gramatical	Definición
Agropecuario	Agricultural	Sustantivo	Relativo a la producción de vegetales.
Incidir	To stress	Verbo	Resaltar el interés de algo para hacer notar su importancia.
Actores	Stakeholders	Sustantivo	Persona o grupo de personas que comparte la obtención de un negocio.
Antrópica	Relating to humans beings	Adjetivo	Producido o modificado por la actividad humana.
Interanual	Year-on-year	Adjetivo	Que procede de la comparación entre una cantidad y la correspondiente a un año antes.
Acuicultura	Aquaculture	Sustantivo	Cultivo de especies de la flora y fauna acuáticas
Personas productoras	Producers	Sustantivo	Persona que interviene en la elaboración de bienes o servicios
Fortalecimiento	Strengthening	Verbo	Acción y efecto de fortalecer
Intersectorial	Cross-sectoral	Adjetivo	Integración de varios sectores con una visión conjunta para resolver problemas sociales.
Interinstitucional	Interagency	Adjetivo	Perteneciente o referido a dos o más instituciones relacionadas entre sí.
Fitosanitario	Phytosanitary	Adjetivo	Perteneciente a la salud de las plantas y productos de origen vegetal.
Zoosanitario	Zoosanitary	Adjetivo	Perteneciente a la limpieza de los animales y productos de origen animal

Bioinsumos	Bioinputs	Sustantivo	Productos de origen biológico formulados con microorganismos que son utilizados para mejorar la productividad y la salud de las plantas o el suelo.

Table 6. Glossary of the most relevant terms

Chapter VI

Conclusions and Recommendations

6.1 Purpose of the Conclusion

This chapter will discuss the researcher's objectives and how they were achieved. Presenting the main events that occurred during the whole investigation to highlight difficult processes that the researcher faced and how to resolve them. This section discusses the restatement of the research question provided in Chapter I, the analysis of unexpected results found during this research and work, and recommendations for future investigations to support future researchers with similar works.

6.2 Conclusions

6.2.1 To translate agricultural documents from Spanish into English and English into Spanish.

The principal objective of this research project is to translate documents that require a good-quality translation. The researcher applied some techniques and procedures to achieve this important work. In order to achieve this, the researcher must read the documents several times to understand the context of the topic. Once the researcher finished the first step to read the documents, it was time for the translation to begin. It was important to mention the challenges in both translations, which will be discussed in Unexpected Results.

Furthermore, both documents present difficult words and expressions used in the agricultural field; the researcher knew this and carefully applied the correct terminology

and translation to be as coherent as possible. The researcher achieves accuracy, clarity, coherence, and style in the translation documents. It was not a surprise to find some errors during the translation, either made by the translator itself or by the author's work; however, these problems were quickly resolved thanks to the researcher's knowledge.

6.2.2 To create a glossary with the most relevant terminology in both texts.

The researcher put those difficult words in a glossary as soon as the translation process started. The importance of a glossary in this type of work is noticeable. Thanks to the glossary, the researcher acknowledges difficult definitions, words, and concepts more easily to understand and achieve its goal. Creating the glossary was simple, thanks to several online resources such as dictionaries, agricultural documents, agricultural webpages, and discussions with experts to support complex communicative situations. This objective is important to mention because it helps the researcher's work by guaranteeing an accurate translation of difficult words, concepts, and definitions during the translation work, making it easier to go back and look at those terms when needed. The researchers hope to help those who will start a future investigation similar to this project and use the glossary as a reference.

6.2.3 To create a color-coding chart to find out types of translation techniques.

Once both documents were successfully translated, it was time to create the color-coding chart to analyze the translation techniques applied during the translation. As mentioned in Chapter II, translation techniques refer to the various methods and approaches used by translators to transfer the meaning of a source language into a target language. This

objective will discuss the different translation procedures used in both documents and how they were applied during the translation work.

Starting with the transposition technique this procedure happens when there is a change in the grammatical category from one language to the other. Transposition was mostly used in the translation because of many terms where the word order changes due to the language's nature and the grammatical structure change with several words in the texts, such as indefinite articles in Spanish to pronouns in English.

On the other hand, there is a modulation technique, which deals with changing the perspective or a variation of the message from one language to another without changing grammatical categories. This technique barely appears in the translation; only on special occasions must the researchers apply this procedure to maintain comprehension and accuracy in the text.

Another procedure was an omission when some elements were out of the target text from the source text. Omission plays an important role, especially in translating Spanish into English. In order to make the English translation as simple and as short as possible, several elements were left out to make a comprehensible and coherent translation.

Additionally, amplification was also prevalent in the translated text. Used when there is an addition not found in the source text. This technique was applied to put additional words like pronouns and conjunctions needed to achieve naturalness.

Another procedure is explicitation. It entails expressing what is implicit from the source language into the target language. Even though this technique can be easily confused with the amplification technique, the researcher manages to identify this technique during

the translation. Some subjects or pronouns needed to be added in Spanish since it is unnecessary; the researcher must be sure to express them fully in English to keep meaning. The same occurs in English to Spanish translation, where it is necessary to put different articles before nouns or add any missing parts of the sense from one language to another. Overall, explicitation is important to maintain the comprehension of the text.

Literal Translation was heavily used in both translations to reflect similar grammatical structures of the source text into the target text without missing the idiomatic sense. This technique is controversial for several translators experts since it loses the translator's creativity while translating one language into another. Since Spanish and English are close in terms of language structures, the use of this technique was inevitable. Nevertheless, other techniques were applied since literal translation used to lose some nuances and may result in unnatural in the target language.

Last but not least, punctuation changes can be found in the translations, which refer to modifications or adaptations made to punctuation marks when transferring a text from one language to another. Even though this technique was the least used, it can be found during needed sentences. For example, Spanish and English use different punctuation when numbers appear, as well as in English where commas are used between a group of three or more items in a series; however, in Spanish, the last two items do not have a comma.

6.2.4 To evaluate the effect of the translation techniques applied to the documents.

The creation of a color-coding and glossary chart enables the researcher to be helpful in achieving a good quality translation, being appropriate to identify good use of the techniques already mentioned earlier. As a translator, it is important to understand these translation procedures and all the translator competencies and mastery of both languages to avoid linguistic transference and translation errors. Many challenges were successfully resolved by using all the researcher's tools. Moreover, agricultural documents were not easy to translate since this field uses a technical language that only the experts on the topic would simply understand. Fortunately, the knowledge, understanding, and application of these techniques will greatly improve the quality of the translation.

Since both documents present information, it is necessary to understand these terminologies and technical words so the future reader can recognize the grammar level of these documents. This text's main focus is on individuals familiar with the agricultural field. Nevertheless, some technical words or definitions could not be translated word-for-word or did not have a faithful translation into the other language; it is the translator's work to fix this problem by using some translation techniques to resolve these challenges easily.

The researcher thoroughly studied and practiced each translation technique and acknowledged which techniques are correct to use in the future—ending all this task successfully and sending faithfulness, naturalness, and a cohesive translation. Eventually, the use of translation techniques and other tools positively affected the translated text.

6.3 Restatement of the Research Question.

As mentioned in Chapter I, there was an important objective for the entirety of the investigation. What is the effect of the procedure and methods used to translate the

documents "Política Pública del Sector Agropecuario Costarricense 2023 - 2032" from Spanish into English and "The Avocado Industry in Israel" from English into Spanish for Cooperativa de Productores y Comercializadores Agrícolas. After going through the investigation for the last months, it is truthful to conclude that several procedures and methods were successfully used to acquire a good quality informative translation that is comprehensive, natural, and cohesive.

The translation procedures were important to translating technical terminologies, such as agricultural terminologies, that only individuals in this field would easily understand. Both texts include transposition, modulation, omission, amplification, explicitation, literal translation, and punctuation changes. All these translation techniques played an important role in the process and support of the researcher during the work. Transposition allowed for technical terms, sentences, and notions that required this method to provide a faithful translation, transferring a grammatical and correct word order. Modulation aided for technical terms that could have been more truly translatable and changed to a point of view to convey the same idea or concept without losing coherence. Omission assisted in erasing words and segments not needed at that moment. Amplification allowed the clarify segments in the target language that were needed; otherwise, it would be finished in unsuccessful translation and loss of sense. Likewise, explication was allowed to be brought to the target language elements to easily clarify concepts that were already explicit. Lastly, punctuation changes played an important role by correctly adding punctuation marks in the target language.

Being a translator is not only about changing one language word to another; the translator needs to make decisions throughout the text that would make a translation more

accurate, faithful, natural, and high-quality content. This also brings the translator's point of view; another translator would apply other types of translators instead of what the researcher decided was correct to apply. Nevertheless, the researcher acknowledges why a translation procedure was applied correctly.

Moreover, the text and language function type used the communicative translation method. The researcher knew the type of translation he was dealing with and took into account the value of both texts while considering contextual meaning and format, creating a high-quality level of translation and coherence.

The researcher hopes to help the APACOOP's employees and clients expand their information for foreign readers. The researcher will contact APACOOP company so they will happily accept this work. The researcher wishes these documents would help foreign readers easily read them without problems in their native language.

6.4 Unexpected Results (If any)

Unsurprisingly, this work brought many challenges for the researcher, who was unaware of this at the time. Such challenges are format errors, difficult words without meaning in the other language, the correct name from some places and institutions in the other language, technical names of avocados, time, and grammar mistakes. Let us review each challenge one by one:

I started with the number of errors within the document, making it harder to edit. For example, some pages in English have section breaks without purpose. Nevertheless, this was a minor problem; the true challenge was the source text in Spanish, which has titles in colors (mixing the titles with bold or not), images between the text, most pages with two columns, and section breaks. The researcher did not expect many format errors within the text; fortunately, we could fix them and make the translation similar to the source text.

Another problem was the difficult words that needed to be translated into another language. Both documents present this problem since they use technical words, making the researcher deeply research the meaning of these words and how to translate them into other languages properly. Fortunately, the researcher applied some translation procedures to translate those words easily without losing meaning.

Continuing with names of places and institutions for other languages. It is the translator's work to know and investigate the appropriate names of these names. For instance, in the source text of English, since the context of the place was Israel, some names of that country were shown; translating these names into Spanish was different because they were called differently in the other language. In the case of the source text of Spanish, the challenge was different because it was some institutions' names. The majority of these institutions were located in Costa Rica. Thankfully, these institutions already have a name in English and the correct acronyms.

If it was a true surprise for the researcher, it was the technical names of avocados in the source text for English. Once all these technical names of avocados appeared, it was the

researcher's work to determine whether those names differed in Spanish. Luckily, all of them are international cultivars, and it was not necessary for their translation, but the researcher learned that all avocados are different.

Moving on with the time. The researcher took so many times to translate these documents at a time. The average of word translations per day was 1000; however, in some cases, there were definitions and concepts, making the researcher look and research the definitions and appropriately comprehensively translate them. Even though the time was challenging for the researcher, he could present a naturalness and coherence work.

Finally, the grammatical and structural errors once the translation was done. The researcher always checks his work to find inaccuracies within the text. To the researcher's surprise, many grammar mistakes were found, especially in the English-Spanish translation. Many acute accent marks were missing, and words that miss one letter are just a few examples. Fortunately, the researcher fixed all these grammar mistakes and understood the importance of checking your work before sending it.

6.5 Recommendations

The next recommendations provide support and suggestions for future translation projects of this level and for future researchers and translators to use these recommendations as a guide for their projects.

Firstly, being prepared for what you are going to do. Take notes and consider the time consumed for this type of project. Prepare beforehand all the tools you would need to

translate documents without any rush, as well as the context topic of the document you are going to translate; if the topic is difficult to understand, try to contact an expert in your field.

Secondly, consider the time of your work and how many hours you will spend on the project. Write down the average number of words you can translate in an hour, and try to maintain that amount so you can finish your translation in time.

Finally, be bold and find people to help. Even the most expert translator needs recommendations and improvements. Ask people who know the topic; it can be someone familiar with the topic field or even the document's original author if possible. When there are expressions of a certain phrase, a semantic characteristic, or an idiom that is difficult to understand in another language, it is favorable to ask a second opinion about it. You could ask a professor, classmate, tutor, and even external information websites where anonymous people can help you. It is normal to ask for help, so deliver the best work possible using all the knowledge available. Continue practicing, studying, and reading other translation studies to expand your knowledge and accomplish your goals.

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Annexes

Annex 1


Ministerio de
Agricultura y
Ganadería
DE COSTA RICA
COSTA
RICA 22
26
POLÍTICA PÚBLICA PARA EL SECTOR
AGROPECUARIO COSTARRICENSE
2023-2032
ENERO 2023

Política Pública para el Sector Agropecuario Costarricense 2023-2032

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Enero 2023

LISTADO DE **ACRÓNIMOS**

SIGLA	SIGNIFICADO
AF	Agricultura Familiar
BID	Banco Interamericano de Desarrollo
CAN	Consejo Nacional Sectorial Agropecuario
CIPF	Convención Internacional de Protección Fitosanitaria
CORBANA	Corporación Bananera Nacional
CORFOGA	Corporación Fomento Ganadero
CONARROZ	Corporación Arrocera Nacional
COTECSA	Comité Técnico Sectorial Agropecuario
COSEL	Comité Sectorial Local
CSRA	Comité Sectorial Regional Agropecuario
CTI	Ciencia, Tecnología e Innovación
CTP	Colegios Técnicos Profesionales
DNEA	Dirección Nacional de Extensión Agropecuaria
ECADERT	Estrategia Centroamericana de Desarrollo Rural Territorial 2010-2030
EASAC	Estrategia Agricultura Sostenible Adaptada al Clima para la región del SICA 2018-2030
EPYPSA	Estudios, Proyectos y Planificación S.A.
FODEA	Ley de Fomento a la Producción Agropecuaria
FONAFIFO	Fondo Nacional de Financiamiento Forestal
GpRD	Gestión para Resultados de Desarrollo
ICAFE	Instituto del Café de Costa Rica
INA	Instituto Nacional de Aprendizaje
INTA	Instituto Nacional de Innovación y Transferencia en Tecnología Agropecuaria
LAICA	Liga Agrícola Industrial de la Caña de Azúcar
MAG	Ministerio de Agricultura y Ganadería
NAMA	Acciones Nacionales Climáticamente Apropiada
OCDE	Organización para la Cooperación y el Desarrollo Económico
ODS	Objetivos de Desarrollo Sostenible
OIE	Organización Mundial de Sanidad Animal
OMC	Organización Mundial del Comercio
PAI	Programa de Abastecimiento Institucional
PEDRT	Política de Estado para el Desarrollo Rural Territorial
PEN	Plan Estratégico Nacional
PNDIP	Plan Nacional de Desarrollo e Inversiones Públicas
SEPSA	Secretaría Ejecutiva de Planificación Sectorial Agropecuaria
TICs	Tecnologías de Información y Comunicación

TABLA DE CONTENIDO

PRESENTACIÓN

El sector agropecuario costarricense atraviesa una situación crítica, por lo que requiere de un esfuerzo interinstitucional que, bajo la rectoría del Ministerio de Agricultura y Ganadería; permita rescatar al sector productivo nacional.

El estado de situación actual, desde una óptica sectorial, es complejo, la cantidad de instituciones involucradas con duplicidad de funciones y excesos de estructuras administrativas, desfinancian sus áreas sustantivas, así como, la desconcentración de estas, propician un traslape de competencias que ocasionan a su vez, deficiencias.

La búsqueda de la competitividad en cultivos que no necesariamente cuentan a priori con una ventaja comparativa, pasa por la eficiente investigación, un favorable ambiente de negocios y una toma de decisiones basada en ciencia y técnica, en nuestro caso, debemos trabajar en generar mecanismos para la captura de la información, de forma que estas permitan la toma de decisiones asertivas que motiven la competitividad del sector en los mercados internos y externos del país.

Durante muchos años, el Ministerio y las instituciones del Sector han reducido su presencia en el campo, por lo que la asistencia técnica, la investigación y el traslado de conocimiento se han visto reducidos, ocasionando afectaciones importantes en quienes se beneficiaban de dichos servicios, las personas productoras.

Hoy, estamos iniciando un cambio radical y asignando más recurso humano para potenciar las áreas de mayor impacto para las personas productoras. Acompañado a las acciones antes mencionadas, debemos impulsar aquellos cultivos que a su vez podamos procesar en el país, exportar o vender localmente ya transformados; buscando el beneficio de las zonas rurales, mediante encadenamientos y agregando valor para generar riqueza.

Con la presente Política, esperamos materializar una serie de acciones concretas, ya identificadas, orientadas a la reactivación de un sector económico, que más que importante es indispensable para el desarrollo rural, haciendo uso de herramientas tecnológicas y generando más puestos de trabajo, calificados y no calificados, con esto, deseamos recuperar el atractivo económico de invertir en el Sector Agropecuario nacional.

Víctor Julio Carvajal Porras

Ministro

1. INTRODUCCIÓN

Los retos que enfrenta el sector agropecuario de nuestro país no son menores, y ameritan de la acción estatal coordinada para atenderles, es por esto que la Política pretende dirigir las acciones de las instituciones del sector público costarricense que forman parte del Sector Agropecuario; de manera tal, que actuando conjuntamente se alcancen una serie de objetivos y metas comunes, que den impulso al sector y mejoren la generación de valor público.

Este documento parte de un análisis de situación del sector tanto productivo como institucional, donde se identifican los principales desafíos y retos que se enfrentan, los cuales serán atendidos mediante ejes estratégicos, con sus respectivas líneas y acciones puntuales en los próximos 10 años.

La elaboración del Plan Sectorial para operativizar la política, será liderada desde la rectoría con el apoyo de la Secretaría Ejecutiva de Planificación Sectorial (SEPSA), en la cual se definirán las intervenciones, responsables, plazos, indicadores de seguimiento y presupuestos, para cada uno de los ejes.

Con esta política, se busca que las instituciones que forman parte del Sector Agropecuario respondan a las necesidades actuales del sector productivo, con el firme propósito de que cumplan de mejor manera su misión y tengan un mayor impacto en el bienestar y desarrollo.

Toda vez que repercutan en un sector más productivo, competitivo y sostenible, que cada día genere más y mejores retornos tanto económicos como sociales.

2. MARCO METODOLÓGICO

La construcción de la Política incluyó la participación de las instituciones del Sector Agropecuario, la academia y el sector productivo, este proceso fue liderado por la Secretaría Ejecutiva de Planificación Sectorial Agropecuaria (Sepsa), que también contó con el apoyo de cooperación técnica por parte del Banco Interamericano de Desarrollo (BID), mediante un proceso participativo que generó el *"Diseño Estratégico de la Política Pública para el Sector Agropecuario Pesquero y Rural"*, documento utilizado como insumo para la elaboración de la Política Pública para el Sector Agropecuario Costarricense 2023-2032.

En primera instancia se realizó la identificación y análisis de los problemas y desafíos que presenta el Sector, ello con el fin de contar con los elementos necesarios a tomar en cuenta en el proceso de formulación de la política. Con esta caracterización se procedió a identificar los actores vinculados al Sector, así como las diferentes intervenciones públicas. Paralelo a esto, se realizaron entrevistas a actores claves, tanto institucionales como del sector privado, que brindaron insumos importantes para el diseño de la política pública.

Con estos insumos se elaboró un primer documento de síntesis que fue sometido a consulta, con los actores identificados mediante un cuestionario electrónico, esto con el fin de recibir la retroalimentación respectiva y reforzar el proceso de construcción de la política.

Al ser la política el marco de referencia y de direccionamiento para la coordinación y planificación de las acciones del Sector Agropecuario, y considerando los resultados obtenidos de los procesos mencionados, se procedió a la construcción de la visión y la misión estratégica para el Sector, la definición de principios, ejes y líneas de acción propuestas, que posteriormente fueron validados por grupos focales de trabajo.

Esta primera etapa concluyó con la presentación ante el Consejo Nacional Sectorial Agropecuario (CAN) en abril del 2022, cuya propuesta fue por recibida y aportada como insumo principal para la definición de una nueva política sectorial.

Luego de una serie de sesiones de trabajo con las autoridades sectoriales y el Ministro Rector, se redefinió la visión, las prioridades, las orientaciones estratégicas, ejes, líneas y acciones, dando como resultado el documento base de Política Pública para el Sector Agropecuario Costarricense 2023-2032.

Dicho documento fue sometido a consulta para realimentación por parte de los distintos actores, y con ello tomar en cuenta la dinámica económica, la rápida, creciente y disruptiva transformación tecnológica, los cambios demográficos y socio-territoriales, las nuevas tendencias en los gustos y preferencias de las personas consumidoras, los retos y consecuencias previsibles del cambio climático y la transformación de la institucionalidad pública, todo ello a favor de la competitividad del Sector Agropecuario.

3. MARCO **NORMATIVO**

El Ministerio de Agricultura y Ganadería como órgano Rector del Sector Agropecuario según se establece en la Ley 7064, "Ley de Fomento a la Producción Agropecuaria FODEA y Orgánica del MAG", es el responsable de definir y conducir la política pública para el sector agropecuario.

En el ámbito internacional, en las últimas tres décadas Costa Rica ha adquirido compromisos multilaterales, así como acuerdos comerciales que el país debe honrar. Entre los compromisos de mayor relevancia se pueden citar la incorporación a los siguientes organismos internacionales: Organización Mundial del Comercio (OMC), la Organización para la Cooperación y el Desarrollo Económico (OCDE), la Convención Internacional de Protección Fitosanitaria (CIPF), la Organización Mundial de Sanidad Animal (OIE), así como la suscripción de la Convención Marco de Naciones Unidas sobre Cambio Climático, el Código de Conducta para la Pesca Responsable, y los Objetivos de Desarrollo Sostenible (ODS).

En este sentido, esta Política tiene una relación estrecha con los Objetivos de Desarrollo Sostenible, contribuyendo con ella al cumplimiento de estos, como aporte del Sector Agropecuario.

Otro compromiso que tiene el país está relacionado con el Consenso de Montevideo sobre Población y Desarrollo (CdM), particularmente en la Política Pública para el Sector Agropecuario Costarricense 2023-2032 en su eje de Productividad y Sostenibilidad, se vinculan acciones con la medida A de dicho consenso, que se refiere a la integración plena de la población y su dinámica en el desarrollo sostenible con igualdad y respeto de los derechos humanos, específicamente en los siguientes acuerdos: 5) Buscar el desarrollo sostenible como medio de asegurar el bienestar humano equitativamente compartido por todos los pueblos hoy y en el futuro, garantizando que las interrelaciones entre la población, los recursos, el medio ambiente y el desarrollo sean plenamente reconocidas, convenientemente administradas y establecidas en un equilibrio armonioso y dinámico con la salud de la biodiversidad y los ecosistemas; y 6) Garantizar un patrón de producción y consumo sostenibles y evitar el agravamiento de los cambios climáticos indeseados provocados por las actividades antrópicas.

Asimismo, se cuenta con una serie de compromisos a nivel de la región centroamericana en el marco de los órganos del Sistema de Integración Centroamericana, tales como la Estrategia Centroamericana de Desarrollo Rural Territorial 2010-2030 (Ecadert), la Política Agropecuaria de la Región SICA 2019–2030, la Estrategia Agricultura Sostenible Adaptada al Clima para la región del SICA 2018-2030 (EASAC), instrumentos que tienen como fin común, el desarrollo de las comunidades rurales, la agricultura sostenible y un Sector competitivo e integrador de los actores públicos y privados.

En cuanto a la normativa nacional, el Sector Agropecuario, fue creado mediante el Título II de la Ley N°7064, Ley de Fomento a la Producción Agropecuaria y Orgánica del MAG, del 29 de abril de 1987, conocida como Ley Fodea, sus reformas y otras leyes conexas.

Dicha normativa establece los mecanismos de coordinación sectorial, establecidos por la Ley N°7064 tales como: el Consejo Nacional Sectorial Agropecuario (CAN), liderado por el Ministro de Agricultura y Ganadería como rector e integrado por los jerarcas de las once instituciones del Sector.

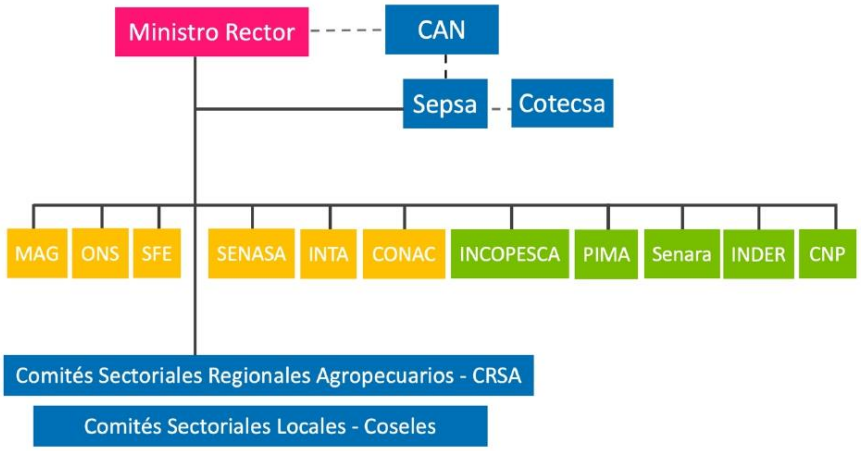
Asimismo, existe el Comité Técnico Sectorial Agropecuario (Cotecsa), instancia técnica conformada por los Directores de Planificación de las instituciones del sector, que en coordinación con Sepsa plasman las directrices emitidas por el CAN.

También, debe mencionarse las Corporaciones, entidades especializadas y entes públicos no estatales, que velan por el desarrollo de las actividades productivas.

FIGURA 1

SECTOR AGROPECUARIO

MECANISMOS DE COORDINACIÓN SECTORIAL NACIONAL, REGIONAL Y LOCAL



Fuente: Sepsa, elaboración propia, 2022.

Es propio considerar el Decreto 43580-MP-PLAN "Reglamento Orgánico del Poder Ejecutivo" de junio del 2022, en el cual la Administración Chaves Robles, definió la estructura sectorial con la siguiente conformación institucional:

1. Ministerio de Agricultura y Ganadería (MAG) y sus órganos desconcentrados a saber: Consejo Nacional de Clubes 4-S (CONAC), Instituto Nacional de Innovación y Transferencia en Tecnología Agropecuaria (INTA), Servicio Fitosanitario del Estado (SFE), Servicio Nacional de Salud Animal (SENASA)
2. Consejo Nacional de Producción (CNP)
3. Instituto Costarricense de Pesca y Acuicultura (INCOPESCA)
4. Instituto Nacional de Desarrollo Rural (INDER)
5. Programa Integral de Mercadeo Agropecuario (PIMA)
6. Servicio Nacional de Aguas Subterráneas, Riego y Avenamiento (SENARA)
7. Oficina Nacional de Semillas (ONS)
8. Corporación Arrocera Nacional (CONARROZ)
9. Corporación Bananera Nacional (CORBANA)
10. Corporación de Fomento Ganadero (CORFOGA)
11. Corporación Hortícola Nacional
12. Instituto del Café de Costa Rica (ICAFE)
13. Liga Agrícola Industrial de la Caña de Azúcar (LAICA)
14. Oficina Nacional Forestal, entendiéndose que su participación será asociada a la producción forestal
15. Fondo Nacional de Estabilización Cafetalera (FONECAFE)
16. Fondo Nacional de Sostenibilidad Cafetalera (FONASCAFE)

Además, se cuenta con otros instrumentos de política previamente elaborados y con los cuales la Política debe estar alineada.

Política de Estado para el Desarrollo Rural Territorial (PEDRT) 2015-2030, cuyo objetivo general es: Fomentar el desarrollo inclusivo de los territorios rurales, reconociendo y respetando sus características propias y la identidad cultural de su población, por medio de un sistema de articulación público privado, que reduzca las desigualdades e inequidades económicas, sociales, culturales, ambientales y político-institucionales, mediante el desarrollo de capacidades y oportunidades para sus habitantes.

Política Nacional de Semillas 2017-2030, con el objetivo de: Promover el desarrollo del sector semillerista costarricense con un enfoque articulador de los intereses y recursos de sus integrantes, para mejorar la eficiencia productiva del Sector Agropecuario, en función de los retos que plantean la seguridad alimentaria y nutricional, la preservación de la biodiversidad, el cambio climático, la globalización de mercados y la garantía de la calidad de las semillas.

Política de igualdad de género para el desarrollo inclusivo en el sector agropecuario, pesquero y rural costarricense 2020-2030 y su plan de acción, cuyo objetivo es: Reducir de manera significativa las desigualdades de género en el desarrollo de las actividades productivas, por medio de una atención efectiva e igualitaria en la prestación de servicios institucionales del sector, en su entorno territorial y regional.

Asimismo, debe alinearse con el marco estratégico de largo plazo para el país y señalado en los siguientes instrumentos:

- Plan Estratégico Nacional–PEN 2050.
- Plan Nacional de Descarbonización 2018-2050.
- Estrategia Económica Territorial para una Economía Inclusiva y Descarbonizada 2020-2050.
- Plan Nacional de Desarrollo e Inversión Pública–PNDIP 2023-2026.

Este marco normativo nacional e internacional, establece el alcance de las medidas de Política que se pueden implementar para impulsar el Sector, acorde con la normativa nacional y sin incumplir los compromisos internacionales.

4. ESTADO DE SITUACIÓN **DEL SECTOR AGROPECUARIO**

El Sector Agropecuario, es de gran relevancia económica y social; esto queda reflejado en su participación en el Producto Interno Bruto (PIB), las exportaciones (fuente de divisas), así como en su contribución al empleo, la mejora de las condiciones socioeconómicas de la población rural, producción de alimentos, entre otros.

Este se caracteriza por la coexistencia de micro, pequeño, medianos – donde un importante número de unidades productivas se enmarcan en lo que se ha denominado Agricultura Familiar (AF)- así como grandes productores, orientados hacia los mercados internacionales

Este Sector presenta importantes asimetrías entre productores agroexportadores y productores para mercado local. Esto sumado a insumos agrícolas que no responden a las nuevas tecnologías y con una importante concentración de mercado.

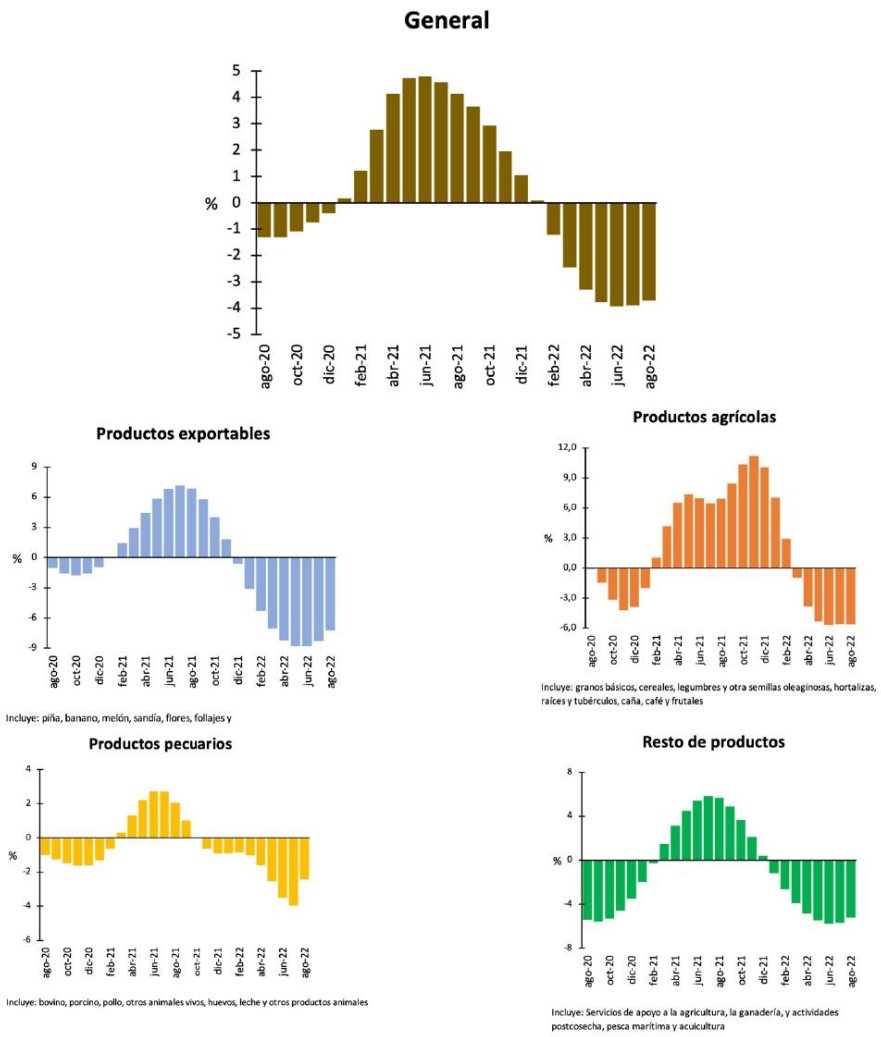
Según datos del Banco Central de Costa Rica, la participación de la agricultura ampliada en el PIB fue de un 9,6% en el año 2021, de este porcentaje el 4,5% corresponde al sector primario y un 5,1% a la agroindustria. Con respecto al valor agregado agropecuario, el 69% corresponde a actividades agrícolas, un 21% a la actividad pecuaria y el restante 10% se compone de actividades de apoyo (6%), silvicultura y extracción de maderas (3%) y, pesca y acuicultura (1%).

En cuanto al comercio internacional, el sector agropecuario es superavitario; con datos del año 2021 se registró exportaciones por USD 5.610,9 millones de dólares e importaciones de USD 3.156,9 millones, lo que significa una balanza comercial de USD 2.454 millones. El 39,1% del total exportado está vinculado con el sector agropecuario, e incluye productos agrícolas (21,3%), de la industria alimentaria (14,0%), el pecuario y pesca (2,7%) y otros de cobertura agropecuaria (1,1%).

El sector agropecuario ocupa el segundo lugar a nivel sectorial como generador de empleos con unas 238.227 personas ocupadas, lo que representa un 11,7% de la población total ocupada. De este grupo de personas, un 87,7% corresponde a población masculina y un 12,3% a población femenina.

No obstante, el Índice Mensual de Actividad Económica del sector agropecuario (IMAGRO) muestra variaciones interanuales negativas en el año 2020 y una desaceleración a partir del mes de abril del 2021, llegando a valores negativos desde el mes de febrero del 2022, situación con similar tendencia en productos exportables, servicios de apoyo, pecuarios y agrícolas.

FIGURA 2
VARIACIÓN INTERANUAL DEL IMAGRO GENERAL Y SEGÚN TIPO DE ACTIVIDAD AGROPECUARIA.
PERÍODO: AGOSTO 2020 – AGOSTO 2022



Fuente: Elaboración de SEPSA con datos del BCCR, IMAGRO, 2022.

Lo anterior muestra la urgencia de reactivar el sector primario, pues es innegable que su desenvolvimiento impacta el desarrollo socioeconómico del país, en especial la periferia costarricense.

Por otra parte, la edad media de la población ocupada en el Sector se ha incrementado en los últimos años, a esto se suma que parte de la población joven, especialmente los que tienen un mayor nivel académico, se traslada a las áreas urbanas en busca de oportunidades laborales en otros sectores.

Es oportuno hacer referencia al papel de las personas extranjeras migrantes en suplir las necesidades de mano de obra en el Sector Agropecuario, especialmente en períodos de cosecha de algunos cultivos de importancia nacional.

En lo que se refiere a la pobreza, las zonas rurales enfrentan índices mayores. Por ejemplo, en el 2021 el Índice de pobreza ascendió al 26,3% en las zonas rurales, mientras que en las zonas urbanas fue de 21,8%, y la pobreza extrema se estimó en 5,5% para zonas urbanas y 8,3% para zonas rurales.

La desigualdad en los ingresos de la población total, medida por el Coeficiente Gini en la última década, presenta valores que oscilan entre 0,524 y 0,515. Por otro lado, en el Sector Agropecuario las personas con actividad independiente tienen valores del coeficiente más altos (fluctúa entre 0,575 y 0,618 para los años 2015 a 2019) que para las personas asalariadas (entre 0,414 a 0,447)[1].

En el tema de inclusión, las mujeres productoras presentan menores oportunidades que los hombres en cuanto a empleo formal, acceso a activos, asistencia técnica, financiamiento, entre otras condiciones. Asimismo, tienen un limitado acceso a tierras para la producción, lo que reduce aún más sus posibilidades de salir de la pobreza[2].

Por otro lado, Costa Rica tiene un territorio marino que representa 11 veces su superficie terrestre, no obstante, el peso económico del subsector de pesca y acuicultura es mínimo (menos del 0,1% del PIB). Las actividades relacionadas con la pesca resultan importantes para las comunidades costeras, sin embargo, no se ha logrado que dicho aprovechamiento sea su motor de desarrollo y que por medio del encadenamiento se logren fuentes alternativas de ingresos.

[1] El resultado de este coeficiente se debe interpretar como un valor entre 0 y 1, donde 0 significa la perfecta igualdad (esto es cuando todos tienen los mismos ingresos) y 1 la perfecta desigualdad (donde una persona concentra todos los ingresos y los demás ninguno). Sepsa, 2019. El Coeficiente de Gini en el Sector Agropecuario 2010-2019

[2] Política de Igualdad de Género para el Desarrollo Inclusivo en el Sector Agropecuario, Pesquero y Rural Costarricense 2020-2030 y I Plan de acción.

5. POBLACIÓN **OBJETIVO**

La Política Pública para el Sector Agropecuario Costarricense 2023-2032, define la población objetivo como las personas productoras físicas o jurídicas que desarrollan actividades agrícolas, pecuarias, pesqueras, acuícolas y/o agroindustriales en el territorio costarricense.

6. PRINCIPALES **DESAFÍOS DEL SECTOR**

Después de la crisis económica de la década de los años ochenta, el país generó cambios en su modelo de desarrollo, el cual se ha caracterizado por ampliar la incorporación de la economía costarricense al mercado internacional, mediante la promoción y diversificación de las exportaciones, así como la atracción de la inversión extranjera directa.

Sin embargo, a pesar de los beneficios de este modelo de apertura comercial, el sistema económico generó una dualidad productiva, por un lado un sector productivo dinámico y vinculado a cadenas globales de valor, y por otra parte, una estructura productiva dedicada al mercado interno con poco encadenamiento y dispersión de las instituciones llamadas a su fomento, asimismo, los programas de apoyo se han visto reducidos producto de la contracción del gasto para controlar el déficit fiscal.

En virtud de lo anterior, el Sector Agropecuario requiere de una Política Pública, que considere los retos a los que se enfrenta el Sector, así como las nuevas demandas que plantea el entorno; para generar soluciones con los recursos existentes, de manera que se logre el cumplimiento de los objetivos de la presente Política.

6.1 AUMENTO DE LA COMPETITIVIDAD Y PRODUCTIVIDAD

Desde el punto de vista económico, las principales actividades agropecuarias, tanto las orientadas al mercado externo como interno, enfrentan importantes desafíos relacionados con el mejoramiento de su productividad y competitividad ante la existencia de mercados cada vez más exigentes, el ajustar sus técnicas productivas a las nuevas tecnologías de producción y procesamiento.

Se requiere identificar y aprovechar nichos de mercado a nivel nacional e internacional para mejorar el posicionamiento de productos tradicionales e incluir nuevos productos en mercados emergentes, generando a su vez sinergias que permitan ampliar los beneficios a las zonas rurales.

La diversificación de la oferta y el incremento de su productividad y competitividad tiene además una

finalidad social: garantizar la existencia de bienes y servicios en los mercados y con ello contribuir a una adecuada alimentación y nutrición de la población.

El sector público juega un papel importante en el aumento de la productividad, por medio de la investigación de nuevas ofertas tecnológicas, variedades resilientes, agricultura de precisión y transferencia de servicios de extensión que le permitan al productor por medio de un aumento de su productividad, ser competitivo.

Otros aspectos clave para generar el incremento en la productividad se refieren a: la disponibilidad de información para la toma de decisiones, la infraestructura, manejo de datos y acceso al financiamiento, entre otros.

6.2 RESPUESTA INSTITUCIONAL EFICIENTE A LAS NECESIDADES DE LAS PERSONAS PRODUCTORAS

Las instituciones del Sector Agropecuario no han podido responder con la celeridad necesaria a los cambios en la actividad agropecuaria producto de los avances tecnológicos, ni mucho menos han podido reaccionar oportunamente para asistir al productor ante las aperturas comerciales aprobadas desde años atrás, esto ha afectado a las personas productoras principalmente por:

I. Una reducida inversión pública, incapaz de generar el impacto suficiente para el desarrollo del Sector.
II. Deficiente capacitación de los funcionarios, que impiden abocarse de manera efectiva al servicio de las personas productoras.
III. Recambio generacional en el personal de las instituciones públicas poco efectivo.
IV. Falta de armonía o coordinación efectiva de las instituciones del sector, que duplican procesos y destinan recursos sin una planificación por objetivos clara.

6.3 PRODUCCIÓN SOSTENIBLE Y ADAPTACIÓN AL CAMBIO CLIMÁTICO

El mercado ha evolucionado, debido a que ahora no solamente requiere de productos de calidad, sino que adicionalmente demanda producción sostenible, libre de deforestación, productos orgánicos, productos con baja carga química, sumado a esto, se deben realizar modificaciones en los sistemas productivos para incorporar acciones de mitigación y adaptación al cambio climático.

Las transacciones en los mercados internacionales priorizarán aquellos bienes producidos bajo sistemas de manejo sostenible, por encima de barreras arancelarias, razón por la cual, las instituciones del Sector Agropecuario deben estar preparadas para estos avances y no dejar a ningún productor atrás.

6.4 INCIDIR EN EL MEJORAMIENTO DE LA CALIDAD DE VIDA EN LAS ZONAS RURALES

El Sector Agropecuario es, en muchos casos, el motor de las economías rurales, ya que su auge o declive tiene repercusiones inmediatas en este entorno. Como se mencionó anteriormente, el 26,3% de la población rural vive en condiciones de pobreza, razón por la cual el Sector se debe convertir en un canal efectivo para reducir dicha condición, impulsando un proceso activo de inclusión social que involucre a toda la población rural para que mejoren sus condiciones y oportunidades.

6.5 ESTÍMULO A UNA COMERCIALIZACIÓN EFICIENTE

El Sector Agropecuario presenta el desafío de estimular una relación más directa y eficiente entre el sector productivo y los consumidores, esta cercanía permitiría la obtención de mejores precios para las personas productoras y consumidoras, fomentar la calidad, la agregación de valor y la diferenciación de productos. Lo anterior, incluye el desarrollo de nuevas formas de comercializar los productos, tales como subastas, mercados de cercanía, comercio electrónico, entre otros.

6.6 TECNIFICACIÓN AGROPRODUCTIVA

Con el avance de los cambios tecnológicos, el Sector Agropecuario a nivel internacional ha ido incorporando la tecnología en los sistemas productivos, incrementando productividad y disminuyendo costos de producción.

La interacción entre la informática[3] y la biología (en particular herramientas de mejoramiento genético, biotecnologías) abren importantes oportunidades para las personas productoras de incorporarse activamente al uso y aplicación de esas nuevas tecnologías.

6.7 CAMBIOS DEMOGRÁFICOS

El país está experimentando un proceso de cambio demográfico, manifestado en la progresiva disminución de la población rural; mientras la población total en las últimas décadas crece a 1,4% acumulativo anual, la población rural decrece a una tasa de 1,3%. En el Sector Agropecuario, se aprecia un progresivo aumento de la edad promedio de la población ocupada, en gran medida relacionada con la existencia de un importante flujo migratorio de población joven del medio rural, que no está encontrando oportunidades atractivas en el Sector. Esta incapacidad del Sector de mantener la población joven es determinante para el desarrollo del Sector; pues son precisamente ellos quienes cuentan con mayor formación y potenciales habilidades para incorporar las nuevas tecnologías, y constituirse en agentes de cambio para modernizar y diversificar la producción rural.

[3] Incluye entre otros la microelectrónica, manejo de datos, inteligencia artificial, teledetección, etc.

7. ENFOQUES Y PRINCIPIOS

En este apartado se desarrollan los principales enfoques y principios presentes en la Política del Sector Agropecuario Costarricense 2023-2032.

7.1 ENFOQUES

- *Desarrollo Sostenible:* La definición original de la Comisión Mundial sobre el Medio Ambiente y el Desarrollo[4] la cual indica: "*El desarrollo sostenible es aquel que satisface las necesidades del presente sin comprometer la capacidad de las futuras generaciones de satisfacer sus propias necesidades*". Este concepto considera que este tipo de desarrollo comprende tres dimensiones: la económica, ambiental y social.

- *Derechos humanos:* Marco conceptual que orienta la promoción de procesos de desarrollo humano y se basa en las normas internacionales.

- *Derecho inclusivo:* Este enfoque pone especial énfasis en una visión de desarrollo que no excluya, todo lo contrario, que integre y sume a todos los actores sociales. Este enfoque aplica una estrategia que pone en el centro el desarrollo social, la reducción de brechas de desigualdad y la contribución a la reducción de las vulnerabilidades estructurales.

- *Gestión para Resultados en el Desarrollo:* Orientación para la acción colectiva y coherente, mediante la cual los gestores públicos del desarrollo promueven la generación de mayor valor público, tendiente a garantizar la efectividad de los bienes y servicios públicos y que se traducen en satisfacción de la población. Este enfoque establece responsabilidades por el logro de resultados; promueve una rendición de cuentas más efectiva, oportuna y veraz; y permite la verificación por parte de la opinión pública y la ciudadanía.

[4] Informe Brundtland de 1987.

7.2 PRINCIPIOS ORIENTADORES

Estos principios orientadores son:

- *Sostenibilidad Multidimensional:* El Sector Agropecuario dirigirá sus esfuerzos al uso y utilización eficiente de los recursos, procurar la satisfacción de las necesidades de las personas productoras sin comprometer las opciones de las generaciones futuras y garantizar un mejor posicionamiento en los mercados.

- *Integralidad:* El desarrollo del Sector Agropecuario requerirá de procesos de articulación y complementariedad de las intervenciones públicas a desarrollarse, tomando en cuenta los distintos sectores de la economía en los ámbitos nacional, regional, territorial y local.

- *Solidaridad:* Basada en la ayuda mutua entre los distintos actores que integran al Sector Agropecuario, que permitan alcanzar una vida digna para todas las personas.

- *Inclusión:* Incorporar a las personas y grupos sociales sin distinción de ninguna naturaleza a los recursos y servicios brindados por el Sector Agropecuario.

- *Responsabilidad social:* Actuar en beneficio de la sociedad actual y futura mediante una oferta de *bienes y servicios públicos oportunos y eficaces.*

- *Transparencia y rendición de cuentas: Seguimiento y evaluación de las acciones implementadas, en el cumplimiento de las intervenciones públicas establecidas en un clima de diálogo y articulación entre la institucionalidad pública y el sector privado.*

8. MISIÓN, VISIÓN **Y OBJETIVOS**

8.1 VISIÓN

Al 2032 ser un Sector competitivo, productivo, encadenado, tecnificado, inclusivo y sostenible que cumpla un rol dinamizador de la economía, generador de oportunidades y beneficios económicos, sociales y ambientales.

8.2 MISIÓN

Aumentar la competitividad del Sector, mediante acciones orientadas a la productividad, la sostenibilidad (económica, social y ambiental) y la resiliencia y adaptación al cambio climático, que propicien una mayor inserción de la producción nacional en los mercados, la generación de empleos dignos, contribuyendo así a la mejora de las condiciones de vida de la población.

8.3 OBJETIVO GENERAL

Potenciar la sostenibilidad económica, social y ambiental mediante la implementación de herramientas y mecanismos que contribuyan al desarrollo y bienestar de la población vinculada al Sector Agropecuario Costarricense.

8.4 OBJETIVOS ESPECÍFICOS

- Apoyar al sector productivo agropecuario mediante la modernización de las instituciones públicas, para la oportuna atención de las necesidades de las personas productoras.
- Generar las condiciones idóneas para la mejora de la competitividad de las personas productoras del Sector Agropecuario.
- Contribuir al aumento de la productividad y sostenibilidad de la producción agropecuaria, a través de mecanismos eficientes que permitan a las personas productoras hacer frente los desafíos del mercado.
- Potenciar el desarrollo económico mediante la agregación de valor, tecnologías y ventajas competitivas de la producción agropecuaria y pesquera para el bienestar de la población rural.

9. EJES, LÍNEAS ESTRATÉGICAS **Y ACCIONES**

La Política del Sector Agropecuario está conformada por ejes estratégicos que responden a los desafíos identificados, asimismo, cada eje está compuesto por líneas y acciones. En el siguiente cuadro se muestran los desafíos y los ejes que responden a estos.

CUADRO 1
VINCULACIÓN DE LA POLÍTICA PARA EL SECTOR AGROPECUARIO COSTARRICENSE 2023-2032 CON LOS ODS Y DESAFÍOS DEL SECTOR

EJE	Contribuye a ODS	DESAFÍOS
1.MODERNIZACIÓN DE LAS INSTITUCIONES DEL SECTOR AGROPECUARIO	ODS1 ODS2	Respuesta institucional eficiente a las necesidades de la persona productora.
2. FOMENTO DE LA COMPETITIVIDAD	ODS2 ODS6	Aumento de la competitividad y productividad.
3. PRODUCTIVIDAD Y SOSTENIBILIDAD	ODS1 ODS2 ODS6 ODS8 ODS12	Aumento de la competitividad y productividad. Producción sostenible y adaptación del cambio climático. Tecnificación agroproductiva. Cambios demográficos.
4. VALOR AGREGADO Y COMERCIALIZACIÓN	ODS1 ODS2 ODS5 ODS8	Estímulo a una comercialización eficiente. Incidir en el mejoramiento de la calidad de vida en las zonas rurales.

Fuente: Sepsa, elaboración propia, 2022.

9.1 EJE 1. MODERNIZACIÓN DE LAS INSTITUCIONES DEL SECTOR AGROPECUARIO

El Sector Agropecuario está compuesto por una estructura institucional pública amplia y compleja, donde según sus competencias, se desarrollan las acciones para atender a las personas productoras, desde la producción primaria hasta la comercialización. A su vez, cuenta con una serie de mecanismos que posibilitan los procesos de planificación y coordinación entre sus instituciones. Pese a la existencia de estas instancias, en los últimos años la coordinación de la acción institucional se ha mostrado débil e insuficiente.

El ejercicio de una Rectoría clara en el cumplimiento de los objetivos del Sector Agropecuario, orienta las capacidades de las instituciones involucradas, promoviendo la coordinación y la concertación de la acción institucional, lo cual trae como resultado un mayor impacto en la gestión pública y satisfacción en la persona productora.

El Sector Agropecuario requiere de una institucionalidad eficaz, eficiente, moderna, tecnificada, fortaleciendo la gobernanza y mejorando los procesos de toma de decisiones, para acompañar, guiar e impulsar el desarrollo, económico y social del Sector.

Objetivo: Apoyar al sector productivo agropecuario mediante la modernización de las instituciones públicas, para la oportuna atención de las necesidades de las personas productoras.

9.1.1 Línea Estratégica: Modernización y fortalecimiento de la institucionalidad del Sector Agropecuario

El marco normativo del Sector Agropecuario, está basado en la Ley N° 7064, denominada Ley de Fomento a la Producción Agropecuaria (FODEA) y Orgánica del Ministerio de Agricultura y Ganadería, y sus reformas. Dicha normativa actualmente presenta limitaciones para la coordinación, el alineamiento, la dirección eficaz y eficiente a las instituciones que lo conforman, por lo que se requiere de un ajuste que propicie la construcción de un entorno favorable para la implementación de las estrategias y acciones que se deben impulsar, así como el fortalecimiento de la organización, gestión y toma de decisiones.

Acciones propuestas:

- Reforma del marco normativo para mejorar la gobernanza del Sector y responder a las líneas de desarrollo socioeconómico y ambiental.
- Actualización de las funciones y estructuras institucionales del Sector, para responder a las condiciones del entorno.
- Reforzamiento de la coordinación interinstitucional, que incremente el nivel de eficiencia y eficacia en la gestión pública de las instituciones, así como asegurar el adecuado uso de los recursos públicos.
- Actualización de las regulaciones que incidan en la mejora competitiva del Sector.
- Seguimiento a los proyectos de fomento a la producción que garantice su impacto en la gestión y ejecución.
- Evaluación de la calidad de los servicios que brindan las instituciones con intervenciones públicas.
- Implementación de herramientas tecnológicas orientadas a la simplificación de trámites y mejora regulatoria.
- Reasignación de presupuestos para potenciar las áreas de mayor impacto a las personas productoras.

9.1.2 Línea Estratégica: Fortalecimiento del recurso humano de las instituciones públicas del Sector Agropecuario

Esta línea va dirigida a mejorar las competencias y las habilidades laborales, tanto técnicas como blandas, del personal de las instituciones del Sector, con el fin de responder tanto al modelo institucional, competencial y funcional que se defina, así como a las necesidades del sector productivo. En este sentido, es necesario fortalecer las capacidades en prospección, planificación, seguimiento y evaluación de las distintas intervenciones públicas del Sector.

Por ello, resulta necesario reforzar las capacidades institucionales para: avanzar hacia enfoques y actuaciones integrales y coordinadas, que orienten, con criterio estratégico, los esfuerzos en el Sector y su capacidad de vincular al sector privado y otros actores en el desarrollo del mismo.

Acciones propuestas:

- Identificación de las necesidades de capacidades técnicas y blandas de las personas funcionarias de las instituciones del Sector Agropecuario que requieren ser fortalecidas o generadas.
- Refuerzo de las capacidades técnicas y blandas, y especialización de las personas funcionarias de las instituciones del Sector Agropecuario, como respuesta a las necesidades del sector productivo, según el diagnóstico anterior.

9.1.3 Línea estratégica: Coordinación intersectorial

En el entorno actual, el fortalecimiento de la coordinación entre el Sector Agropecuario y los demás sectores de la institucionalidad y de la sociedad, incrementa las posibilidades de gestionar con éxito las políticas públicas dirigidas hacia las personas productoras. Lo anterior, pues las instituciones externas al Sector Agropecuario, también cuentan con competencias, capacidades y recursos para apoyar las intervenciones públicas.

Acciones propuestas:

- Vinculación e implementación de compromisos y acciones definidas para el Sector Agropecuario en diferentes intervenciones de carácter intersectorial (políticas, planes, programas, etc.).
- Coordinación del sector público, privado y académico para generar productos y servicios acordes a las necesidades del Sector Agropecuario.
- Simplificación de trámites en los servicios ofrecidos por las instituciones públicas que contribuya a la reducción de costos para las personas productoras.
- Promoción de la formalización de las personas productoras, considerando las realidades y particularidades del Sector Agropecuario.
- Coordinación interinstitucional para atender distorsiones en el mercado creadas por las prácticas desleales o anticompetitivas en el comercio nacional e internacional.

9.2 EJE 2. FOMENTO DE LA COMPETITIVIDAD

Esta línea de intervención se orienta a impulsar mejoras en la disponibilidad de información para todos los agentes productivos y tomadores de decisión. Lo anterior, aunado a la prestación de servicios institucionales eficientes y eficaces que incidan directamente en la competitividad, así como el acceso al financiamiento y seguros adaptados a las condiciones del Sector.

Objetivo: Generar las condiciones para la mejora de la competitividad de las personas productoras del Sector Agropecuario.

9.2.1 Línea Estratégica: Generación de información para la toma de decisiones que fomenten la competitividad

Con el propósito de cumplir con la modernización del Sector Agropecuario, esta línea estratégica se convierte en un medio indispensable para que la persona productora tome decisiones con un respaldo técnico que le permita mejorar la competitividad.

Las instituciones del Sector deben generar información útil, confiable, comprensible y de fácil acceso para que las personas productoras tomen la mejor decisión con un escenario claro de lo que puede suceder.

Acciones propuestas:

- Estandarización de los protocolos de captura de información relevante para el Sector Agropecuario.
- Generación de información de interés para las personas productoras referente a variables económicas, climáticas y de mercado nacional e internacional.
- Creación de capacidades en las personas productoras para una mejor comprensión de la información relevante del Sector Agropecuario.

9.2.2 Línea Estratégica: Equipo e infraestructura para la producción

Esta línea estratégica se plantea considerando la importancia del equipo moderno y ajustado a la realidad productiva e infraestructura en óptimas condiciones, que facilite el desarrollo económico primordialmente de las zonas rurales con mayor necesidad.

Acciones propuestas:

- Actualización de las metodologías de formulación de proyectos para equipamiento, de tal manera que se adapten a la realidad regional y que incida económicamente, mejoren la resiliencia y adaptación al cambio climático, con un impacto en la producción y el desarrollo rural.
- Optimización en el uso de la infraestructura disponible para las personas productoras.
- Fortalecimiento del servicio de Red de Frío como un componente de la cadena de comercialización.
- Apoyo a las personas productoras en la modernización y optimización de los procesos productivos.

9.2.3 Línea Estratégica: Servicios eficaces y eficientes asociados a la sanidad vegetal y salud animal

Apoyar a las personas productoras a acceder a mercados internacionales, a la vez que los protegemos del ingreso de plagas que no están presentes en el país, así como el acceso a la población a productos seguros, inocuos y de calidad, mediante las instituciones competentes y la normativa vigente en el ámbito de la producción vegetal y animal con estándares de rango internacional, sin entorpecer el comercio y el tránsito de personas en un país integrado al mundo.

Acciones propuestas:

- Actualización de las normas fito y zoosanitarias y de inocuidad de alimentos en función de modelos de riesgo.
- Protección del patrimonio fito y zoosanitario del país ante la eventual afectación por plagas y enfermedades que amenacen la seguridad alimentaria y actividad económica de la producción nacional.

9.2.4 Línea Estratégica: Acceso a financiamiento y seguros en el Sector Agropecuario

Esta línea estratégica busca generar oportunidades de financiamiento y seguros que permitan a las personas productoras un mayor acceso a recursos con condiciones ajustadas a las necesidades de la producción agropecuaria, además de herramientas de gestión de riesgo que respondan eficientemente a los posibles eventos que las puedan afectar. La propuesta de actuación, en este ámbito, busca expandir los mercados financieros y de seguros, con financiamiento trasparente y acompañamiento para la buena gestión.

Acciones propuestas

- Diseño e impulso de productos financieros y de seguros, con condiciones y garantías ajustadas a las necesidades del Sector Agropecuario que incluyan el componente de producción sostenible, en coordinación con el sector financiero y de seguros.
- Fortalecimiento de los servicios de capacitación y asesoría para la inclusión financiera y gestión de financiamiento en el sector productivo agropecuario.

9.3 EJE 3. PRODUCTIVIDAD Y SOSTENIBILIDAD

La innovación, la investigación y la extensión agropecuaria impulsadas hasta el momento, requieren ser transformadas con los nuevos instrumentos de la revolución tecnológica, la eficiencia en el uso del suelo y el agua y la agregación de atributos ambientales y nutricionales.

Así mismo, la relación de la agricultura y el medio ambiente, incluyendo el cambio climático, han adquirido relevancia en las agendas de las actividades productivas y, en particular, del Sector Agropecuario. Las acciones orientadas al fomento de modelos de producción sostenible (producción orgánica, NAMA's, Bandera Azul Ecológica Agropecuaria, entre otras.) y de las buenas prácticas agrícolas, ganaderas y pesqueras, requieren fortalecerse, mediante el diseño y aplicación de métodos de gestión, en coordinación a lo interno y con otros sectores.

Objetivo: Contribuir al aumento de la productividad y sostenibilidad de la producción agropecuaria, a través de mecanismos eficientes que permitan hacer frente a los desafíos del mercado.

9.3.1 Línea estratégica: Eficiencia en el uso de los recursos naturales para la producción

Esta línea de intervención procura orientar las acciones para un aprovechamiento responsable de los recursos naturales en la producción agropecuaria, de manera que se logren obtener beneficios económicos y velar por su uso sostenible.

Acciones propuestas:

- Implementación de un modelo de asistencia técnica que maximice los beneficios para los diversos sistemas productivos en cuanto al uso de recursos naturales.
- Fomento para la adopción de las buenas prácticas agropecuarias que favorezcan la protección de la salud humana, el ambiente, regeneración de suelos, fuentes de agua y recursos forestales.
- Impulso al uso de tecnologías en la producción primaria y agroindustrial para optimizar el uso responsable de los recursos naturales.
- Fortalecimiento de los programas de infraestructura de riego y drenaje para la promoción del uso eficiente del recurso hídrico.
- Promoción del reconocimiento económico para aquellas personas productoras que implementen acciones efectivas que contribuyan con las metas de descarbonización, mediante mecanismos de trazabilidad e información al consumidor.

9.3.2 Línea Estratégica: Disponibilidad y uso de semillas y material genético

Incrementar la productividad de las personas productoras por medio del desarrollo de variedades de semillas resistentes a diferentes plagas que aquejan la producción, por medio de innovación en el país o bien importación de material genético acorde a las necesidades del sector.

Acciones propuestas

- Coordinación entre los diferentes actores, con el fin de promover la investigación, el desarrollo, la producción, la utilización sostenible y el aseguramiento de semillas y materiales genéticos (agrícolas y pecuarios) apropiados para las características de los sistemas productivos.
- Incremento de la productividad mediante el fomento del uso de semilla de alta calidad, proveniente de la innovación en el país o la importación.

9.3.3 Línea Estratégica: Producción sostenible y gestión del riesgo

El propósito de este eje es impulsar la transformación de los sistemas del Sector hacia una producción más sostenible y resiliente, basada en la adopción de tecnologías con potenciales beneficios productivos y ambientales, los cuales reduzcan la emisión de gases de efecto invernadero, sean menos vulnerables al cambio climático, aumenten la rentabilidad del productor e impulsen el uso sostenible de los recursos naturales.

Acciones propuestas:

- Fortalecimiento de los programas e iniciativas orientados al impulso de agroecosistemas productivos, resilientes, rentables y ambientalmente sostenibles.
- Escalamiento del modelo NAMA en diferentes actividades productivas que mejoren su competitividad, rentabilidad y promuevan la reducción de la vulnerabilidad climática del Sector Agropecuario, mediante el aprovechamiento y mejoramiento de los servicios eco-sistémicos.
- Fomento y reconocimiento de la implementación de prácticas agropecuarias sostenibles.
- Implementación del Plan Nacional de Adaptación (NAP's por sus siglas en inglés) en el Sector Agropecuario que permitan reducir la vulnerabilidad.
- Simplificación de los procedimientos de autorización de nuevas moléculas e inscripción de productos para el uso en insumos agropecuarios que permitan reaccionar de manera pronta ante la materialización de los riesgos.
- Fomento de la producción de bioinsumos para establecimiento de sistemas de producción amigables con el ambiente.

9.3.4 Línea Estratégica: Aprovechamiento del desarrollo tecnológico en el Sector

La presente línea pretende dirigir los esfuerzos para que el Sector Agropecuario aproveche las oportunidades tecnológicas y de innovación en beneficio de su competitividad y rentabilidad, que a la vez incentive la permanencia de la población joven en las actividades agropecuarias y contribuya al proceso de relevo generacional.

Acciones propuestas:

- Utilización de instrumentos y herramientas en las labores de asistencia técnica y vigilancia fito y zoosanitaria. Por ejemplo: drones, teléfonos inteligentes, información satelital, sistemas informáticos, entre otros.
- Formación de capacidades tecnológicas para el aprovechamiento de los nuevos equipos y herramientas tecnológicas para la mejora competitiva.
- Fomento del uso de tecnologías en las actividades productivas de las personas productoras frente a la digitalización.

9.3.5 Línea Estratégica: Investigación y transferencia de tecnología agropecuaria

En el ámbito de la ciencia, tecnología e innovación (CTI), se hace necesario la planificación a largo plazo y la coordinación desde el nivel político para impulsar la generación de tecnologías apropiadas que respondan a la demanda del sector y avanzar en aspectos relacionados con la biotecnología y desarrollar metodologías que permitan su aprovechamiento por parte de todas las personas productoras y empresas agroindustriales.

El sistema de investigación debe estar preparado para absorber el nuevo conocimiento que esté disponible en el entorno internacional (TIC's; invernaderos inteligentes; agricultura de precisión; robotización, etc.) y generar el uso de ese conocimiento para concebir tecnologías adaptadas al entorno del Sector Agropecuario e impulsar su adopción mediante mecanismos eficaces y eficientes de extensión.

Todo ello requiere impulsar cambios en la forma de establecer prioridades de investigación, para ello se debe enfatizar en temas vinculados con el negocio agropecuario y pesquero; tales como creación de valor agregado, cadenas de valor, calidad nutricional, producción de energía, aprovechamiento de la biomasa y otros.

Acciones propuestas:

- Elaboración de una estrategia interinstitucional e intersectorial de investigación e innovación que impulsen el aumento de la competitividad y sostenibilidad para el desarrollo del sector productivo agropecuario.
- Aprovechamiento de las estaciones experimentales para la transferencia de conocimiento y actualización técnica a las personas extensionistas agropecuarias y facilitadoras.

9.4 EJE 4. VALOR AGREGADO Y COMERCIALIZACIÓN

Potenciar el desarrollo económico de las zonas rurales por medio de la generación de valor agregado de los productos locales, así como trasparentar la formación de precios de mercado e identificación de productos con alto potencial exportable, son factores que permiten una mejor participación de las personas productoras en los canales de comercialización.

Objetivo: Potenciar el desarrollo económico mediante la agregación de valor, tecnologías y ventajas competitivas de la producción agropecuaria y pesquera.

9.4.1 Línea Estratégica: Impulso a la agregación de valor a la producción primaria

El propósito de esta línea es aumentar el valor agregado en la producción agropecuaria, que permita una mayor integración de las personas productoras a las cadenas de comercialización, generando oportunidades comerciales a nivel nacional e internacional. Además, promover la diversificación de la oferta de productos agropecuarios y pesqueros que promuevan el desarrollo socioeconómico de los territorios rurales.

Acciones propuestas:

- Promoción de la agregación de valor tanto para el mercado interno como para una oferta exportable y diferenciada en los productos agropecuarios y pesqueros, para generar oportunidades de acceso a nuevos mercados.
- Identificación de nichos de mercado especializados que integren a las personas productoras en la generación de nuevos productos con alto valor agregado.
- Desarrollo de parques agroindustriales sostenibles dirigidos a las personas productoras para su incorporación en las cadenas globales de valor.

9.4.2 Línea Estratégica: Encadenamientos productivos

Con el desarrollo y aprovechamiento de los encadenamientos productivos se pretende mejorar aspectos comerciales y logísticos que contribuyan a la calidad de los productos.

Acciones propuestas:

- Desarrollo de una estrategia de encadenamiento productivo regional, para el aprovechamiento de oportunidades de mercado y el abastecimiento de la agroindustria.
- Promoción de mecanismos asociativos que permitan encadenamientos que satisfagan necesidades en el mercado interno y externo.
- Modernización del Programa Abastecimiento Institucional (PAI) para mejorar el acceso del sector productivo.

9.4.3 Línea Estratégica: Desarrollo y aprovechamiento de mercados físicos y virtuales para la comercialización

La modernización tecnológica en la cadena de comercialización permite un mayor acceso y promoción de productos agropecuarios y pesqueros en diferentes mercados, por lo que se busca la mejora y la creación de nuevos canales de comercialización, mediante la implementación de herramientas virtuales que logren conectar la oferta con la demanda de forma más eficiente y efectiva.

Acciones propuestas:

- Acompañamiento en el desarrollo de capacidades de las personas productoras y pescadoras en técnicas y herramientas innovadoras que faciliten la comercialización.
- Impulso del desarrollo e implementación de plataformas virtuales eficientes que permitan o faciliten la comercialización de la producción agropecuaria y pesquera, así como la formación de precios.
- Promoción de circuitos cortos de comercialización en los diferentes territorios del país, que contribuyan así a los procesos de descentralización económica y estimule el desarrollo de dichos territorios.
- Modernización de los mercados mayoristas para hacer más eficientes los procesos de comercialización, mediante la promoción de la competencia y la transparencia en la formación de precios.

9.4.4 Línea Estratégica: Seguridad alimentaria y nutricional

Fortalecer el sistema alimentario costarricense para ofrecer a las personas consumidoras una amplia variedad de alimentos nutritivos, de calidad y accesibles para satisfacer sus necesidades.

Acciones propuestas:

- Fortalecimiento de las acciones que favorezcan la disponibilidad y el acceso de la población a alimentos de calidad, inocuos y variados para una dieta equilibrada.
- Diseño e implementación de acciones para el aprovechamiento de residuos en las diferentes etapas de la cadena productiva, de comercialización y consumo de productos agropecuarios y pesqueros.

10. MODELO DE GESTIÓN

El modelo de gestión para implementar la presente Política, plantea la coordinación efectiva entre las instituciones que conforman el Sector Agropecuario, así como la vinculación y coordinación con instituciones públicas de otros sectores y organismos de cooperación, esto en procura del beneficio del sector productivo.

Figura 3
Modelo de gestión de la Política Pública para el Sector Agropecuario Costarricense 2023-2032

Fuente: Sepsa, elaboración propia, 2022.

Esta coordinación se desarrolla desde el nivel político en el ámbito nacional, a través del Consejo Nacional Sectorial Agropecuario (CAN), instancia que coordina el Ministro de Agricultura y Ganadería en su condición de Rector del Sector Agropecuario e integrado por las 11 instituciones que lo conforman.

A nivel técnico, con el Comité Técnico Sectorial Agropecuario (Cotecsa), integrado por los directores de planificación de las instituciones del Sector, serán los encargados de incorporar a lo interno de sus instituciones los respectivos ejes, líneas estratégicas y acciones de la Política en los planes de mediano plazo, así como en los planes anuales operativos. De manera tal que se facilite su seguimiento y posterior evaluación.

En el ámbito regional y local, se realiza la coordinación mediante las instancias regionales para establecer mecanismos entre los sectores públicos vinculados y el productivo, con el propósito de mejorar el rendimiento y efectividad de los

servicios que brindan las instituciones públicas en las regiones.

Las acciones de la Política se operativizarán en el Plan Sectorial Agropecuario 2023-2027, el cuál debe elaborarse por eje, líneas estratégicas y metas e indicadores a ejecutar por parte de la institucionalidad pública.

11. SEGUIMIENTO **Y EVALUACIÓN**

El seguimiento se llevará a cabo mediante el monitoreo en la implementación del Plan Sectorial, que permitirá establecer acciones de mejora, así como la rendición de cuentas, dando transparencia al proceso. La Secretaria de Planificación Sectorial Agropecuaria trabajará en el diseño y preparación del seguimiento, el cual consiste en la revisión de los objetivos, metas, actores y responsables; revisión de los indicadores; y definición de las herramientas para el levantamiento de la información y determinación de la viabilidad del seguimiento.

Cabe destacar que, este modelo de seguimiento y evaluación requiere de la elaboración anual de informes en los que se reflejen los avances, las limitaciones y los ajustes para el cumplimiento progresivo de las acciones propuestas para cada uno de los ejes estratégicos de la Política.

12. FUENTES **CONSULTADAS**

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DESARROLLADO POR: SEPSA

Annex 2

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THE AVOCADO INDUSTRY IN ISRAEL - AN OVERVIEW

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ENVIRONMENTAL GROWING CONDITIONS

Climate:
Israel is located along the southern part of the eastern coast of the Mediterranean, between latitudes 30° and 33° North.
Climate in the avocado-growing regions is subtropical: warm rainless summers and cool rainy winters. The rainy season is mainly from November through March. Annual precipitation varies from an average of 200mm in the south to 700mm in the northern coast. A major part of the avocado area in the country is along the coastal plain (see later), but notable growing area is located in the interior hot valleys. Table 1 summarizes the mean, maximum and minimum temperatures for each month in two locations: Bet Dagan, in the coastal plain, and Deganya Alef, in the hot Sea of Galilee Valley.
Temperatures below 0°C are not common in the avocado-growing areas: Orchards have been planted considering the topography, and sites with frost hazard were avoided, particularly after the mid-seventies, in accordance with a nationwide topo-climatological survey implemented by the Meteorological Service of Israel. However, temperatures in some avocado areas have dropped to - 2° - 4°C, and in some low pockets have fallen down to -7°C in certain years.

Severe damage to fruit and trees occurred under such conditions. A more serious threat to avocado crops is the adverse weather conditions which occur occasionally in April and May, a season of flowering and fruit-set: Hot spells ("Hamsins") of 40°C, and in rare cases even 46°C (accompanied by very low relative humidity), have caused severe crop failures, particularly when they lasted several days and when they occurred just after the end of bloom. This has happened on a nationwide level in 1970, 1980 and 1988.

Table 1: Mean daily maximum and minimum temperatures per month (C.) in Bet Dagan and Deganya Alef.

Month	Bet Dagan		Deganya Alef	
	Minimum	Maximum	Minimum	Maximum
January	6.6	17.9	8.4	17.6
February	6.8	19.2	8.8	19.6
March	8.6	21.5	10.4	22.5
April	11.6	24.6	13.0	26.8
May	13.6	26.7	16.3	31.7
June	17.7	29.3	16.3	34.9
July	19.3	30.6	19.0	36.0
August	19.6	30.9	22.0	36.1
Septembe:	18.1	28.0	20.6	34.6
October	14.8	26.9	17.5	30.5
November	11.2	24.2	13.7	25.0
December	8.2	19.4	9.9	19.1

Note: Bet Dagan represents the coastal plain; Deganya Alef represents the hot valley of the Sea of Galilee (Alttude 200m. below sea-level).

Soils:
Three-quarters of the total avocado areas in the country are planted on various types of Grumusols, heavy-textured soils containing 8-20% lime ($CaCO_3$), with pH 7.8 - 8.2 and with fair internal drainage. In the coastal plain, some orchards are planted on loamy sends with no lime (pH 7-7.3) or, in the south-west, with 5-10% lime.
In the Sea of Galilee Valley, some orchards are planted on very calcareous soils (40% $CaCO_3$), with trees grafted on specific adaptable rootstocks (see para. "Rootstocks").

Irrigation Water: All avocado orchards are regularly irrigated throughout the dry hot season. Most of the water in Israel is supplied by a state owned company, and allocated by the State Water Authority according to quotas linked to land tenure. Water is either pumped from underground reservoirs, containing 50-400 ppm Chlorine, or supplied from the National Water Carrier, starting at the Sea of Galilee, which contains 190-250 ppm Cl. Water price is determined by the government (presently - 18 US cents per 1 m^3).

REGIONAL DISTRIBUTION OF ORCHARDS

Out of the 7,800 Ha of avocado in the country (1995), 5,600 (about 72%) are grown along the coastal plain, mostly in its northern and central parts (including 3% in the "Western Negev" in the south). Another 1,600 Ha, about 20%, are spread in the interior valleys of Huleh (in the north), Sea of Galilee and in the Valley of Jezre'el. The remaining 600 Ha, about 8%, are planted in the Southern

Lachish region and at the foothills of Judea's mountains. Orchards with high production can be found in all the above regions. However, the coastal plain north of Acco (known as "Western Galilee") was notable for years for its higher average yields, resulting probably from factors like favorable climate, suitable soils and low salinity in irrigation water. In addition, the percentage of 'Hass', the most productive CV in the country for a long period, was higher there than in other regions.

The above regional yields have dropped in recent years, partly due to increasing salinity of the local irrigation water and also due to the decrease in average yields of 'Hass', a national phenomenon which has yet to be fully explained. The aforementioned is demonstrated in table no 2.

70% of the total avocado area in the country is cultivated by Kibbutzim (cooperative settlements), 30-100 Ha each. The rest consist mainly of small family orchards of 1-3 Ha. Table no.2 represents an area of 1,500 Ha of orchards belonging to Kibbutzim. The data was provided with the courtesy of the "Miluot" regional packing house. Note: The table should not be misinterpreted: it does not represent national averages.

Table No. 2: Yields by cultivars in various periods, in the "Western Galilee" (T/Ha, rounded off)

Cultivar	Average of 10 seasons 1970/1-1980/1	Average of 4 seasons 1983/4-1986/7	Average of 6 seasons 1988/9-1993/4
Ettinger	13.0	16.5	10.5
Fuerte	8.5	12.5	7.5
Hass	15.0	15.5	8.0
Nabal	14.0	17.0	13.0

THE DEVELOPMENT OF THE INDUSTRY - A BRIEF HISTORY

The first grafted avocado trees were introduced to Israel in 1924 (to Mikveh-Israel Agricultural School). Research was initiated in the early thirties. (Introductions and observation plots). Small avocado nurseries were established in the mid-forties. Planting on a commercial scale started in the fifties and in 1960 the total avocado area reached 300 Ha. The success in the initial export of avocado on a commercial scale encouraged further planting and in 1970 the area grew to 2,100 Ha, of which 1,000 Ha were already bearing and produced 7,200 tons (of which 4,400 were exported). In the course of the next 13 years the area expanded rapidly, reaching its peak of more than 11,000 Ha (55% at bearing age). In 1983 production was almost 60,000 tons, of which 80% were exported.

The fast growth was induced by a combination of several factors, mainly:

a) High profitability in the sixties and the seventies due to adequate yields (average of 10 T/Ha), and very high export prices: 2000-2800 US$/T (adjusted to present $ value), F.O.B. Israel. Those prices were obtained in Europe owing to very intensive - and expensive - promotion activities.

b) Financial support by the government (20% allowance plus 50% loan on establishing costs) and by other national funds, for planting of export fruit crops.

c) Relatively low labor requirements compared with other fruit crops. This trait has been particularly important to kibbutzim, who tried to avoid hired labor. The sixties and the seventies were noted for the intensive research and extension activities in avocado, carried out by the Ministry of Agriculture, with very active participation by grower's organizations and individual growers.

In the early eighties, the situation changed for the worse. The following factors were responsible for this change:

1) Since 1982/83, growers experienced several successive seasons of poor return per ton, partly due to unfavorable exchange rates, particularly in the 1984/5 season. (See table no. 3).

2) The season of 1986/7, with an unprecedented bumper crop of 127,000 tons, was followed by a succession of several years with low yields. This resulted from a coincidence of extreme alternate off-season in 1987/8, followed by the disastrous 1988/9 season (85% crop failure due to a rare heat-wave), and this was followed by the severe freeze of Feb. 1989.

Disappointing production also took place in the seasons of 1992/3 and 1993/4, in which weather factors could have played a partial role.

3) The widespread planting in the late seventies and early eighties expanded to marginal climatic and soil sub-regions. In addition, resort to poor saplings, sometimes with rootstocks which were unsuitable to local soil types and salinity of irrigation water, was not uncommon at that time.

4) The gradual increase in salinity of irrigation water in considerable areas has probably caused a decrease in yields, particularly in orchards planted originally on Mexican rootstocks (which are susceptible to salinity).

5) A series of drought years brought about a reduction in quotas of water for agriculture in the early nineties, including avocado groves. Many growers cut their irrigation by 20-25% for 2-3 years until 1994,

when the quotas were increased.

Table no. 3 demonstrates the downfalls in the Israeli avocado production. Since the late eighties, erratic and low crops have shaken the dominant position of Israel as the main stable supplier of avocado to the European markets. Meanwhile, the growing demand for avocado in those markets has attracted offers by other countries. All the above problems brought new planting practically to a standstill and induced a trend of neglect and uprooting of avocado orchards. Presently, the planted area is estimated at 7,800 Ha of which 10% are new topgrafts, or new planting, which has resumed gradually in 1992, mainly by experienced growers.

CULTIVARS

In 1970, with a total avocado area of 2,100 Ha, the percentage of the main cultivars was: 'Fuerte' - 43%, 'Ettinger' - 20%, 'Hass' - 17% and 'Nabal' - 10%. This proportion was based on the accumulated experience and on the preference of the export markets at that time. The recommendations on cultivars were set by the Subtropical Fruit Governing Board and by the Extension Service. The Board has guided the research and development of the avocado industry in the country from 1960 until 1989. It included representative from research, extension services, growers and the exporting body. The above proportion of cultivars has changed considerably during the last fifteen years, and in 1995 the situation is: 'Fuerte' - 25%, 'Ettinger' - 25%, 'Hass' - 30%, 'Nabal' - 4% and 'Reed' - 6% (Estimated).

Following are some remarks on the main commercial avocado cultivars, all introduced to Israel from California, except the first one.

'Ettinger': A local selection of a chance seedling. Parentage is unknown, but it contains certain traits of the Mexican race such as tolerance to low temperatures (4 hours of -6°C in a mature tree) and thin skin. Harvest season is early but short: mainly October through November. Bright green skinned, with good commercial size. High internal quality. Yields are good to medium. A potent pollinizer to 'Hass' and 'Pinkerton' (and perhaps additional cultivars).

'Fuerte': Apparently several clones were introduced to Israel, some of them not productive. The practice of girdling, applied in some orchards (mainly in the seventies) did not solve the problem of average low and erratic yields of this cultivar. Therefore, it lost its dominance in the orchards and was uprooted or top- worked to more productive cultivars in many orchards. This trend has recently slowed down in view of encouraging results of Paclobutrazol

applications in stabilizing its yields. The main harvest season is November through February.

'Hass': The most productive commercial cultivar until 1987/8; suffered since from a downfall in average yields (see table 2), until 1995. This cultivar suffers from average small fruit size, a phenomenon which is aggravated in older plantations, due to worsening of soil aeration (increased compaction) and under conditions of increase in salinity of water. All of the above are common events in the industry. Harvest season is November through April.

'Nabal': The tree is very sensitive to winter storms (limb breakage and fruit fall), to frost, and to Pyriform Scale (see "Pests and Diseases"). Strongly alternate bearer. Average fruit-size is bigger than desired. Harvest season is mainly March and April.

'Reed': Introduced only in 1969. Precocious and productive tree. Fruits are slightly oversized. The main harvest season for export is April-May, but many growers delay harvest to the summer (June-August) for the local market.

Other cultivars grown on a commercial scale (2-3% each), are:

'Pinkerton': Mainly in the hot interior valleys. Very productive. Picked in December and January.

'Ardith' ("00-28"): Resulted from the breeding program of Dr Berg in UC Riverside. Successful mainly in the coastal plain. Very vigorous tree, relatively productive. Dark green skin. Picked in March-April.

In the older orchards there are still a very small areas of Wurtz, Benik and Horshim (a local chance seedling). Recent new plantings consist of the following cultivars, in the order of importance: 'Reed', 'Pinkerton', 'Ettinger', 'Hass' and 'Ardith'. No other cultivar resulting from the local breeding program, or from introduction, has yet reached a stage of being recommended for commercial planting; new types are tested now on a small experimental scale.

ROOTSTOCKS

In the sixties, the mother-trees for rootstock seeds were hundreds of different seedling trees, mainly of the Mexican race. In addition, seeds were obtained from cultivars: Mexican, like Topa-Topa', 'Northrop' and 'Mexicola'; Guatemalan ('Nabal') and later - West Indians or their hybrids, like 'Lula', 'Winslowson', 'Waldin', 'Fuchs'

etc. At that period, a large-scale field research on avocado rootstocks was initiated. In this unprecedented work, led by Dr A. Ben-Ya'akov, many new orchards were planted with a pre- arranged planting design of various rootstocks, without interfering with the original plan of cultivars in each orchard. A large group of avocado growers actively participated in this program; they collected yield data for every tree in their commercial orchard, which was a common practice in many orchards in the country until the mid eighties (and was aimed at thinning-out of less productive trees). The above "nationwide experiment" included hundreds of different rootstocks and gradually it grew up to 300 different plots with more than 140,000 trees. The above planting continued in the eighties and included also experiments with clonal rootstocks. Notable differences in the effects of the various seedling rootstocks (and later - of clonal rootstocks) were found, with regards to bestowing of fruitfulness, tolerance to high salinity, to high lime content and even to soil aeration. Gradually and consistently, inferior rootstocks were screened out of the list of recommended mother-trees. In the last decade, clonal (vegetative) rootstocks selected locally by Dr Ben-Ya'acov were added to the list, including 'VC 6', 'VC 51', VC 65', 'VC 66' and others. They are already demanded by growers, although still on a limited scale. Recent demands are still mainly for nursery trees grafted on selections of seeded rootstocks, primarily 'Deganya 117' and some 'Ashdot 17', both local West Indian types. In addition, rootstocks grown from seeds of certain West Indian cultivars are also in demand, like 'Waldin' and 'Fairchild'.

CULTURAL PRACTICES

Irrigation:

About 85% of the avocado area in Israel is irrigated by mini-sprinklers (with various outputs and types). In the rest, drip-irrigation is used. No obvious differences between the two methods have been found so far with regard to effect on orchard performance. However, mini-sprinklers - even under the canopy - are considered advantageous as means for partial alleviation of frost or hot-spell damages. Calculation of daily water consumption is based, in many orchards, on regional or local data on evaporation (from 'Class 'A" pan), plus orderly readings of tensiometers. The recent common practice of irrigation is not based on results from the several irrigation experiments conducted in the sixties and the seventies (with sprinkle irrigation covering most of the surface) or in the eighties (with mini-sprinklers). The typical present practice of irrigation during the peak season (July through September) for mature orchards, is the following: Intervals of 2-3 days between irrigations (with mini-sprinklers) and a dose of water calculated to

an index of 0.70 of the evaporation. This means a daily use of 5-5.5mm in the coastal plain (around 8,OOOm^3/Ha per season) and 7 mm in the interior hot valleys (around 10,000 m^3/ Ha per season).

Recent field observations on irrigation, aided by dendrometers, have not yet produced proven results which justify changes in the existing irrigation practice.

Fertilization:

Results of the several experiments in avocado fertilization, carried out in Israel, were not sufficient, so far, to serve as a general guide for recommendations. Present practices in most of the orchards are based partly on results of leaf analysis, but more on local experience and observations, on tree vigor and crop load, and on consulting with the Extension staff or with a regional researcher. The present common practice is "Fertigation" along the whole irrigation season. In some orchards, pre-bloom application of N (1/4 of the annual dose) is practiced.

A common annual dose per Ha of bearing orchards is 200-300 kg N, 50- 70kg P_2O_5 and 200-400kg K_2O. Manuring (with composts) is common in some orchards, mainly in "Bio-organic" plantations (150-200 Ha). Iron-induced chlorosis is widespread in many areas, either due to high lime content in the soil together with past use of susceptible rootstocks, or due to poor soil aeration. Fertilization with Iron Chelates is a common practice for correction.

Zinc deficiency is occasionally observed but rarely treated. Very little attention has been given so far to Boron deficiency because common visual symptoms were practically unobserved. This issue seems to deserve more attention in view of the relatively low level of Boron in many leaf analysis results.

Management of Tree Crowding (pruning, thinning etc):

The common planting density of avocado in Israel, 270-410 trees/Ha (according to cultivar and growing conditions), was planned, in the past, for future thinning- out of trees. This practice was recommended at that time particularly for 'Fuerte' and 'Nabal'; the solution suggested for problems of crowding and shade in 'Hass' was pruning. However, growers were often late with carrying out the thinning, and pruning was light or limited to some topping. The above situation has recently changed and since the end of the eighties, annual hedging and topping (mechanical or manual) became the common practice for management of tree crowding instead of thinning-out of trees.

Orchard Soil Management:

The common practice in young orchards is spraying with pre-emergence herbicides near the trees (on 1-1.5m strip) twice a year, and occasional mowing between rows. In mature orchards, the necessity of weed control greatly decreases due to shading together with the natural mulching with accumulated leaves. Pruned branches are generally shredded and serve as additional mulch.

Pollinizers and Pollinator:

In recent years, local research, supported by isozyme technique, has shown that 'Ettinger' is a potent pollinizer for 'Hass', 'Pinkerton' and perhaps additional cultivars. Application of those findings has already taken place in all new plantings as well as in many bearing orchards where 'Hass' was planted in solid blocks (by top-working 10-15% of the trees to 'Ettinger').

There are still no clear answers regarding the need for cross-pollination of 'Ettinger', 'Fuerte' and 'Reed'. Honey- bees are the main pollinator of avocado in Israel and most growers rent bee-hives for this purpose (around 2-3 per Ha).

PESTS AND DISEASES

Avocado in Israel is not greatly troubled by pests, probably due to several factors:

a) careful conservation of natural biological balance, owing to intensive research and extension, and strict practices of biological control.

b) Being a relatively new crop in a country remote from the centers of origin.

c) Strict quarantine measures taken during introduction of avocado propagation material, and ban on import of avocado fruits.

d) Events of extreme high and low temperatures that may have hindered the development of some avocado pests prevalent in the tropics.

The important avocado pests in Israel are:

Boarmia setenaria: A looper that feeds on fruitlets and fruits, which may cause considerable reduction in yield and damage to fruits if not monitored and controlled in time (by 1-2 sprays with *Bacillus thuringiensis)*. The Pyriform scale *(Protopulvinaria pyriformis)* severely attacks 'Nabal', and has been observed on other cultivars. Control measures are generally spot- sprays with mineral oil, combined with spreading of wasps of the genus *Metaphycus* or of *Cryptolemus montrouzieri.*

The Greenhouse Thrips *(Heliothrips haemorrhoidalis)* may sporadically attack various cultivars. ('Ardith' is particularly susceptible).

The climate in Israel is unfavorable to development of diseases of fruit or canopy of avocado. Avocado Root-rot *(Phytophthora cinnamomi)* was first identified in Israel in 1982. It's spread has been limited, so far, to 40-50 Hectares only, mainly in moist spots of very heavy soils or other sites with poor drainage. Selection of local resistant or tolerant rootstocks is being carried out. Inflorescence Dieback may cause serious damage, in some years, mainly in 'Hass', by considerable reduction of yields of infected trees. The factor responsible for this phenomenon is still unknown.

HARVESTING AND PACKING

Harvesting of avocado in Israel is controlled by the national Avocado Corporation. Nine regional packing houses serve the industry: Two principal ones (20-30% of the total, each), four medium sized (8-10% each) and three small ones (3-4% each). National export standards for fruit maturity and external quality, which are more severe than the EEC standards, are set by a statutory committee, and inspected by the Inspection Service for Agricultural Produce for Export, Ministry of Agriculture.

Detailed crop estimates, by cultivars and regions, are carried out by the Avocado Corporation and a tentative weekly harvest program is formulated for the whole season.

This is planned together with AGREXCO Ltd., the sole exporter - by state law - of avocado and of many other agricultural products.

At the beginning of the season (generally in the last week of September) harvest starts in each region according to criteria of percentage of dry matter (representing oil content) for each cultivar. The above is determined after a repeated systematic sampling survey. Later, harvest continues according to a re-planned weekly program and allocation of quotas by the Corporation headquarters to each packing house. This is based on combined considerations of market demands, size of stocks, availability of produce from each location etc. Selective harvesting (by size) is common. Hundreds of Hydraulic Ladders ("Cherry Pickers"), produced in Israel, are used for picking in tall trees, up to 6.5m.

All exportable avocados are packed in 4kg cartons and exported (Shipped by sea).

Average export percentage for the whole registered crop has been

around 70% in recent years. Almost all the rest is sold fresh in the local market by the Corporation. Rejects and fruits for industry rarely exceed 1-2% of the crop.

PRODUCTION, EXPORT AND PRICES

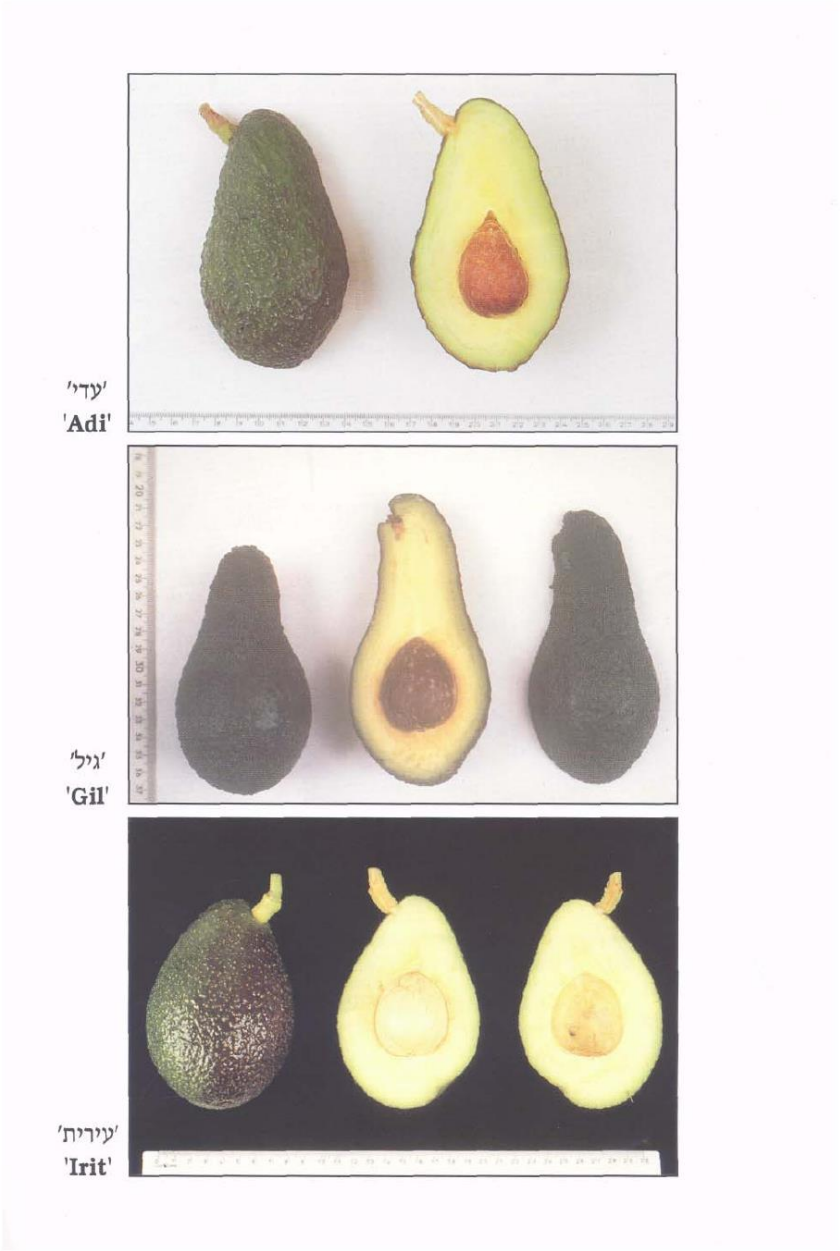
Table 3: Israeli avocado - production and export (in 1,000 tons, rounded off)

Season	Production	Export	F.O.B. Price/T, US$
1979/80	32	26	1,630
1980/81	8[a]	7	2,200
1981/82	40	33	1,400
1982/83	59	49	960
1983/84	52	43	970
1984/85	75	60	760b
1985/86	65	52	1,030
1986/87	127	88	930
1987/88	33	26	1,480
1988/89	17[a]	12	1,840
1989/90	46	35	1,350
1990/91	53	38	1,410
1991/92	74	50	1,160
1992/93	38[c]	27	1,200
1993/94	43[c]	29	1,250
1994/95	51[c]	36	1,230
1995/96 (est.)	80	60	

a= Rare extreme heat-wave in May destroyed most of the crop.
b= Unfavorable exchange-rate for the dollar.
c= Estimated 10% should be added in view of increased non-registered commerce since 1992/3.
Source: Fruit Marketing Board, and the Avocado Corporation.

Table no. 3 presents data on yearly national avocado registered production, exports, and average F.O.B. seasonal average prices, for the last sixteen seasons (each running, practically, from September through May). Unregistered local marketing of avocado has grown in recent years, perhaps due to increasing demand and other reasons. It is estimated that, on this account, 10% should be added to each of the registered crops of the last three years. Therefore, the actual 1994/5 crop, for example, was 56,000 tons (and not as it appears in the table).

The main countries of destination for export of avocado from Israel have been France (50%-60%), Germany (15%) and Great Britain (10%).


'עדי'
'Adi'
'גיל'
'Gil'
'עירית'
'Irit'

MAIN PRESENT PRODUCTION PROBLEMS

1) Average national yield/Ha: This yield has been 7.5 tons for the last six years (including 1995/6 estimate) and can be considered fair when compared to the same averages for California or Spain (particularly in view of the considerable percentage of a poor bearer like 'Fuerte'). Nevertheless, this yield is insufficient for the Israeli producer under the present costs of production and packing, and in view of the avocado trade situation. This insufficiency could even increase in the future. It has been found that considerable differences in yields per Ha exist between orchards with the same cultivar in the same region. This could only be explained by large differences in the level of orchard management, and can demonstrate the unexploited potential of production in the existing avocado area. There is therefore a need for intensifying extension activities, aimed at raising the professional and managerial levels of growers.

An additional reason for the insufficient yields/Ha seems to be the following: Flowering and fruit-set of the main commercial cultivars take place in February - May, a season of very unstable weather with temperatures too high and/or too low for optimal pollination and fruit-set. Major damage to avocado crop has been caused almost always by extreme heat-waves shortly after fruit-set. In addition, there is often very marked reduction in bee activity (pollination) in avocado orchards during the main bloom season of the major cultivars, which coincide with the flowering of very strong competitors, like the vast areas of citrus and of wild vegetation.

In the author's opinion, research, aimed at delaying the bloom of the major cultivars by 2-4 weeks, is required. Bloom should be shifted to a period more favorable for pollination and fruit-set, with stable weather, as well as termination of flowering of competitive plants.

2) Increasing salinity: The salinity of irrigation ground water in major avocado producing regions is gradually increasing, and could be responsible, at least partially, for decreased yields in those areas, particularly where orchards were planted on Mexican rootstocks. Intensifying the research on clonal rootstocks in order to maximize production under conditions of saline water, seems to be needed in order to confront future hazards in this regard.

3) Scarcity of water: Increasing prices and the scarcity of irrigation water may create, in the future, a major constraint to the whole industry. This issue can be identified, perhaps, as the most crucial production problem in the long run.

4) 'Hass': This is the most important cultivar, but it exhibits serious disadvantages like the unexplained reduction in its yields in recent years (excluding 1995/6) or the average fruit- size, which is smaller

than demanded by the trade. It is difficult to forecast whether the intensive (and expensive) breeding program, carried out in Israel for the last two decades, will ever come up with a new cultivar which will be an exact substitute for 'Hass' (or for any other existing cultivar). Nevertheless, the search for new cultivars has to become a permanent project.

Introduction and evaluation of types resulting from foreign breeding programs, have already fruited a commercial cultivar in Israel ('Ardith'), and this activity should also continue, in the authors' opinion.

ECONOMICAL ASPECTS

Economical analysis of the avocado industry in Israel involves many variables which place constrains on simplifying this intricate field. The following information will help, however, in pinpointing the main factors effecting the economical success of the Israeli avocado industry (not including, of course, trade factors, which are not discussed in this article).

1) The average yield of well-cared orchards in the coastal plain has been 10 tons/Ha for a period of 25 years (1961- 1986). At that period, outstanding orchards produced the following average yields: 'Fuerte'[1] - 12 T/Ha, 'Ettinger' and 'Nabal'[1] - 18 T/Ha, 'Hass' - 20 T/Ha. This may demonstrate the potential which was not realized in larger areas due to complex reasons partly discussed in previous paragraphs.

2) The cost of establishing an avocado orchard in Israel is calculated at 15,000 US$/Ha, not including the cost of land.

3) The cost of hired labor in agriculture has been recently 3-5 US$ per hour.

4) The average cost of irrigation water is 18 US cents/1m^3 (1995).

5) The calculated variable costs of production per 1 Ha of avocado in Israel, including 'Ettinger', 'Hass' and 'Reed' in equal parts, are the following: 8,850 US$ at the exit of the packing house, with a calculated yield of 12.3 Ton/Ha. Net grower's profit is 2,850 US$/H. (Source: Division of Agricultural Economics, Extension Service, November 1994).

RESEARCH AND EXTENSION

The Israeli avocado industry has been characterized since its inception by close contacts and rapid flow of information between the Extension Service, the Agricultural Research Organization (the Volcani Center), the Faculty of Agriculture in Rehovot - and the

growers. The first two bodies are a part of the Ministry of Agriculture. In 1995 the Ministry contributed 300,000 US$ to research in avocado, in addition to partially covering infrastructure costs and salaries. The Avocado Growers Corporation invested 200,000 US$ plus an additional contribution of 50,000 US$ by regional organizations of growers.

Main topics of research in avocado are:

1) Breeding of improved and more productive cultivars.

2) Selection of better rootstocks.

3) Improving production by plant growth regulators.

4) Pollination, pollinators and pollinizers.

5) Combination of irrigation and fertilization ("Fertigation").

6) Post-harvest physiology, pathology and technology.

7) Biological pest control.

The Extension staff is comprised of a team of 9 regional Extension Agents specializing in subtropical fruit crops and guided by a nationwide professional coordinator. In addition to their extension activities, they are involved in field experiments and contribute to the inventory of knowledge in avocado production. They are assisted by other extensionists who cover other domains like plant protection, "field service" (i.e.: irrigation and fertilization of crops), agricultural machinery, agricultural economics etc. Those other extension agents are located in the same region or operate on a national level.

In the third decade of this century there were only a few avocado trees in Palestine. Avocado culture grew very slowly during the fourth and fifth decade, but during the last 12 years plantings have increased at a more rapid rate. There are now over 2,000 acres of avocados in the State of Israel. Since 1964 the planting of avocados is subject to the approval of the Fruit Marketing Board and is limited to a total of about 200 acres a year.

THE CLIMATE

The climate of certain regions in Israel is eminently suitable for this fruit crop. The incidence of radiational frosts in these parts is somewhat less than in Southern California. The use of heaters and of wind machines is not warranted even though the temperature inversion on clear nights is very pronounced. In the following table a comparison is given between the monthly minimum and maximum temperatures of a typical avocado area in Israel (Acre) and that of San Diego (in degrees F).

	San Diego* 1875-1930		Acre** 1940-1949	
Month	**Mean Min.**	**Mean Max.**	**Mean Min.**	**Mean Max.**
January	46.6	62.4	49	65
February	47.9	62.9	48	66
March	49.8	63.8	50	68
April	52.5	65.1	54	73
May	55.7	66.2	61	79
June	58.8	69.2	67	82
July	62.4	72.4	71	86
August	63.7	73.9	72	88
September	61.4	73.0	69	85
October	56.7	70.4	63	83
November	51.7	68.2	58	78
December	48.2	64.5	52	68

*U.S. Department of Commerce
**Meteorological Service of Israel 1952

Most avocado orchards in Israel are located in the undulating coastal plain. Two cold spells in the winter of 1963-1964 caused some damage to avocado orchards which taught us the hard way to avoid low-lying spots which are prone to frost damage. However, the recovery in the following spring was very rapid. The lowest temperatures experienced in recent history occurred in 1950, but then avocado culture was still in its infancy.

In recent years a new area has been initiated for avocado culture in the upper Jordan Valley. A narrow strip of land at the base of foothills (a thermal belt) has been found to be sufficiently free of damaging frosts to suit avocados. Another region fairly suitable for avocados is located on the shores of Lake Tiberias, 650 feet below sea level. However, irrigation water is generally too saline in this area for avocados.

SOILS

Avocados are adaptable to a wide range of soils. However, the best soils for avocados are of medium texture and drain quickly of excess moisture. Young avocado trees may, on sandy soils, become chlorotic. On poorly drained, heavy soils avocados may decline sometimes due to a root rot, not caused by *Phytophthora cinnamomi,* which has not yet been found in Israel. Soils suitable for avocados should have over 7% non-capillary pore space and there should not be any perched water table even for a short period within the strata occupied by roots. We are about to introduce the O.D.R. as a criterion for choosing avocado soils.

Avocados are fairly resistant to lime (similar to citrus). Unfortunately, there is no possibility to assess beforehand the influence of lime on the severity of chlorosis. Lime-induced chlorosis and also yellowing of foliage on light soils have been successfully treated with Chelate 138 (ref. 1, 2).

RAINFALL AND IRRIGATION

The rainfall in Israel is limited to the winter months starting usually in October and ending in April. The average rainfall in the coastal plain is 20-24 inches. It is less in the Jordan Valley. Obviously, irrigation has to be resorted to during the remainder of the year. But even in winter, whenever there is a dry spell, avocado trees have to be watered.

Avocados are very shallow rooted; at least 80% of their roots are generally found within the upper two feet. Therefore, frequent and small applications are indicated. They are given in mid-summer at about 10-14 day intervals and about $1^1/_2$ -2 acre inches are applied at each irrigation totaling about 40 acre-inches annually. A heavier application is made at every third watering in order to leach accumulated salts beyond the root zone.

Nearly all avocado orchards (like most other plantings in Israel) are sprinkler irrigated, the usual method being underhead sprinkling at 4-7 degrees from the horizontal.

Avocados are customarily grafted on Mexican stock; on that stock avocados are the most salt sensitive fruit in Israel. Compared to the irrigation water used in Southern California most of the water sources in Israel have a relatively high proportion of

chlorine and it is justified under our conditions to use the chlorine contents as a criterion in judging water quality—120 mgs. per liter of chlorine (about 3.5 M.E.) are considered to be the upper limit. However, some very good avocado orchards are irrigated on well-drained soils with water containing 170-180 mgs. of chlorine per liter (5 M.E.).

Considerable research work is being done with salt resistant West Indian types as rootstocks. However, the degree of salt resistance within the seedling population of one single tree is highly variable. West Indian avocados are being propagated by cuttings in order to obtain a homogeneous clone. This has not yet been utilized commercially. There are some quite satisfactory plantings on nondescript West Indian stock. Fuerte, Duke and Nabal seedlings have been tried as stocks (ref. 3), but have not found acceptance in the industry (they are highly sensitive to lime).

PROPAGATION

Until about eight years ago avocados were propagated almost exclusively by budding Mexican seedlings in the nursery row (ref. 4). The buddings were planted in spring $2^1/_2$ years after sowing the seed in the nursery.

Nowadays seeds are sown in containers in the fall and the young seedlings are tip grafted or side-grafted a few weeks after sprouting. They are ready for planting in situ in fall or in the spring, i.e. 12-18 months after the seed is sown in the nursery. Fall planting (September) is generally preferred because it enables the young plant to strike roots prior to the inception of top growth in spring. We prefer this to planting in spring even though we have to protect the young plant from frosts shortly after planting.

MIXED PLANTINGS

Generally, interplanting two or more kinds of fruit trees is—for various reasons—discouraged. However, it has been found that avocados develop better when planted together with, or in an already existing banana plantation (young coffee plants in Central America do well when grown in the shade of banana plants). Planting bananas and avocados together provides the grower with an income before the avocados come into bearing (the fourth year after planting). The cost of establishing an avocado orchard (which is about $1600 an acre) may be cut thereby into half.

The usual planting distance is 21 x 21 feet (6x6 m), i.e. 112 trees per acre. Sometimes the planting distance is wider, 21 x 26 feet (6x 7.5 m). The objective is to thin out the orchard after the trees start crowding each other when they are 8-12 years old. As a matter of fact, very few orchards have been thinned according to plan. The close planting ensures heavier crops during the early bearing stage, and reduces wind damage and the cost of weed control.

VARIETIES

Many California varieties have been introduced to Israel and, as a result, the choice of commercial varieties resembles that of California. There is only one local selection,

Ettinger, which has become prominent. In most recent plantings in Israel there are no more than five varieties. In the near future this number will be reduced in certain areas to three. Here follows a brief description of our standard varieties in their order of ripening:

1. *Ettinger:* This Mexican- type variety is picked from the middle of October until December. The fruit resembles slightly the Fuerte, but does not reach its quality. It is the most cold and wind resistant variety grown commercially in Israel. The tree is very vigorous and upright, and has the same tendency as the Fuerte to produce at times seedless fruits ("cukes"). It is a heavy, bearer and has been in many orchards the most profitable variety. We are trying now to limit its plantings in order to ensure a more evenly supply of avocados throughout the season. It has a rather short optimum picking season.

2. *Fuerte:* Fuerte is also in Israel the ideal variety from the consumers' point of view. However, it has a number of drawbacks: it is in many orchards not bearing satisfactorily and it suffers also at times from partial non-softening. It has been found that there is a high correlation between low yields and non-softening. Another contributing factor is late picking (ref. 5, 6). Therefore, low yielding trees should be picked early. The ripening season extends from November until March. Due to the selection of budwood from consistently high yielding trees, Fuerte has been more productive in most of the more recent plantings. The present recommendation for future plantings includes a high percentage of Fuerte (at least two-thirds).

3. *Nabal:* This Guatemalan variety has a greater tendency to alternate bearing than other commercial varieties, but it is a good yielder. Its fruit is generally bigger than optimum size. In windy areas (all interior districts as well as the north coast), it is very much subject to shedding when nearly ripe, and to wind scars. It is the most frost-sensitive variety grown. Its picking season is from February to April.

4. *Benik:* This variety is grown to some extent in order to cross-pollinate the Nabal.

5. *Hass:* This is the only variety which has in recent years been added to the recommended list. It is a heavy producer. The fruit tends to be small and hand-thinning may be justified in some instances. Some trees bearing a heavy crop have not enough foliage to protect the fruit from sunburn. The Hass carries well to distant markets and tops even the Fuerte in quality, but its well known drawback is its black and warty surface. It reaches good eating quality before January, but its marketing season may extend until May. The degree to which this otherwise excellent variety should be planted is a debatable subject.

SOME MANAGEMENT PROBLEMS

Young avocado trees need some protection against the direct rays of the sun and against the wind. The latter is very important during the winter months of their first year. Avocados raised in banana plantations do not need such protection.

Some of the upright varieties (especially Ettinger and Nabal) have their terminal growth cut back from time to time in order to produce a more spreading tree. This is done several times during each of the first three or four growing seasons. Some growers here

are bending branches and tying them down instead of cutting them back. They achieve the same result—a more spreading tree.

The need for cross-pollination has not yet been experimentally proven, although there is observational evidence in its favor. The varieties Nabal and Benik are grown together for that purpose and some claim that it is advantageous to grow Fuerte and Hass side by side.

There is an abnormally high percentage of "cukes" with Fuerte and Ettinger this year (1965), which we are trying to relate to adverse climatic conditions during the flowering season. Lack of available moisture during the flowering season may reduce the set considerably.

Due to the shallow rooting habit of the avocado any kind of cultivation may do damage to the root system. Avocado orchards are kept, therefore, under a system of non-cultivation. Old groves are dense enough to prevent weeds from growing. Roots are often found in the top soil.

Nitrogen is the only element applied to most avocado groves. It is also customary to add small amounts of organic manure. Heavy applications of chicken manure have caused certain deficiencies such as Fe and Zn—to appear, as well as marginal leaf burn. Avocado leaf analyses have been studied (ref. 7, 8).

YIELDS

Compared with citrus, avocados are intrinsically a low yielding crop. It seems that any fruit tree producing a crop which contains oil as the elaborated material (in contrast to sugars) is limited in its yielding capacity. Furthermore, avocados may produce as many as 10,000 flowers per one fruit set and this heavy flowering may be a bigger drain on the reserves of the tree than the actual crop. Some of these heavily flowering trees may drop their entire foliage during the flowering season (a similar situation obtains with profusely flowering male carob trees). No one has yet attempted (to our knowledge) to limit this excessive bloom.

As a result of all the above-mentioned factors an annual average yield of three and one half to four tons per acre is considered a fan-average. However, there are some orchards in Israel which average six tons per acre. It is our belief that most orchards under good management and environmental conditions should be able to maintain that level of average production.

There are quite a number of orchards planted in too heavy or too light soils, which will never produce satisfactory crops. It is estimated that about one third of all groves may become marginal as soon as prices drop below the present level of 15-20 cents a pound.

MARKETING

All avocados in Israel are at present sent to three packing houses, where the fruit suitable for exports is packed for shipment abroad and all the remainder of the fruit sold

locally. Since most of the plantings are young, the total yield has not yet reached 2000 tons.

Some research work has been done on the storage of avocados (ref. 9, 10).

PESTS AND DISEASES

a. *Sunblotch virus:* This disease has apparently been brought to Israel by one of the very early avocado introductions. Due to the selection of mother trees as sources of budwood, it is hoped that the incidence of this disease in the newer plantings will be negligible.

b. *Sudden wilt:* Trees on heavy soils are sometimes subject to a sudden wilt which resembles the Verticillium wilt in California. The causal agent has not yet been found. Trees recover sometimes by making growth from the scaffold branches.

c. *Stem end rot:* Certain varieties (especially Anaheim) are subject to stem end rot, which may be caused by a number of fungi. It has been suggested that, when picking avocados, about one-half a cm. of the fruit stalk be left protruding.

All other pests and diseases are of no general importance. Avocado groves are not sprayed in order not to disturb the biological equilibrium.

FUTURE PROSPECTS

The prospects for avocado culture in Israel are strictly limited by nature (quality of irrigation water, topo- and macro-climate, soils). Due to these limiting factors it is not expected that avocados will be in the course of the next five to six years increase in acreage by more than 1.000 acres.

The European market may absorb one-half to two-thirds of the crop. It is suggested that the countries supplying Europe with this new fruit should get together and plan and finance a joint promotion program.

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