



Deliverable title	D7.3 Report on Business Model Evaluation
Deliverable Lead:	UNIVPM
Related Work Package:	WP7. Demonstration of socio-economic benefits of the proposed innovations
Related Task:	T7.3 Business model evaluation
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Dissemination level	PU
Due Submission Date:	30.04.2025
Actual submission:	30.04.2025
Start date of the project	30.05.2022
Duration	36 months
Summary of Deliverable D7.3 – Business Model Evaluation	Deliverable D7.3 represents the final step of WP7, where the consortium moved from consumer insights to the design of viable business models for sea fennel products. Using participatory workshops and an expert validation survey, researchers developed Business Model Canvases (BMCs) and Value Proposition Canvases (VPCs) for two main product groups: sea fennel-based foods and sea fennel-based nutraceuticals. For food products, the strongest value propositions identified were sea fennel's distinct taste, high nutritional value, cultural heritage, and sustainability. Key customer segments include innovative chefs, gourmet consumers, tourists seeking local specialties, and health-conscious buyers. Experts emphasized the importance of specialty shops, online sales, and restaurants as the main distribution channels, with promotional activities such as show cooking events, tastings, and informative packaging with QR codes to build awareness. Success will depend on creative

	marketing teams, contracted farming to guarantee supply, and strategic partnerships with processors, chefs, and research institutions. For nutraceuticals, the focus shifted toward sea fennel's functional health properties: vitamin C richness, anti-diabetic potential, skin and anti-aging benefits, and overall contribution to wellness. Target consumers include healthy food lovers, sportspeople, patients, and women seeking natural products. Distribution channels were identified as online platforms, organic shops, pharmacies, and health centers. Building trust through nutritionists, health specialists, and influencers is key to customer relationships. Here, the critical resources are R&D teams, laboratories for safety and quality testing, and partnerships with pharma companies, nutraceutical labs, and certifiers.
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Versioning and Contribution History:

Version	Date	Authors	Explanation
V1.0	March 2025	E. Ozturk	First draft
V2.0	April 2025	E. Ozturk R. Zanolli O. Karahan Uysal D. Tosun Z. Kenanoglu	Final version

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1 Introduction

Sea fennel (*Crithmum maritimum L.*), a resilient and versatile marine vegetable, has gained growing attention due to its nutritional benefits and potential applications in various fields beyond culinary uses. It holds significant potential for the development of new products, either as food or as nutraceuticals, which require further exploration for sustainable production and consumption. For this purpose, WP7 focused on the socio-economic impact of sea fennel farming along the entire supply chain —from farm to fork— within the framework of a sustainable production approach.

The first task of the WP (Task 7.1) focused on exploring the views of value chain actors regarding the current state of the sea fennel market and the potential of sea fennel products for future market development. Results highlighted that the sea fennel market is underdeveloped, with few products available, and consumer awareness of sea fennel and its products are quite limited. However, the growing preference for natural and local products, along with the nutritional and functional properties of sea fennel, can be a significant advantage for market development. Promoting sea fennel-based products, implementing supportive agricultural and rural policies, and investing in research and development are recommended to accelerate future growth.

Following this, consumer attitudes and acceptance of sea fennel products were assessed under Task 7.2. The results revealed that if consumers are unfamiliar with the product, they will have hardly any relevant purchase intention. Furthermore, while purchase intention is influenced by individual attitudes, the perceptions of others are even more influential. Effective communication of product benefits and leveraging social networks are suggested to improve awareness and encourage purchasing behaviour.

This report is on the last step of WP7, which involves evaluating alternative business models for developing the sea fennel supply chain (Task 7.3). It is aimed to identify the best business models for sea fennel products using a participatory approach with the participation of the stakeholders' platform.

2 Material and Methods

2.1 Business Model Canvas (BMC) and Value Proposition (VP)

Alternative business models for the sea fennel supply chain were evaluated using Osterwalder's Business Model Canvas (BMC) and Value Proposition Canvas (VPC) (Osterwalder et al., 2014; Osterwalder & Pigneur, 2009), with a participatory approach to integrate stakeholder insights. These tools are essential for sustainable product development as they provide a structured approach to understanding and designing business strategies.

According to Osterwalder and Pigneur (2009), a business model (BM) outlines the rationale for how an organization creates, delivers, and captures value. They describe BM through nine fundamental building blocks that illustrate the logic of how a company plans to generate revenue. These nine blocks include four primary areas of a business: customers, offerings, infrastructure,

and financial viability. They are presented in a one-page tool known as the BMC. Similar to a painter's canvas, it enables the visualization of new or existing business models. It is possible to work together with different partners on the BMC to generate, refine, and enhance business ideas or to organize diverse data in alignment with specific business goals. See Figure 1 for the BMC together with the details of each block.

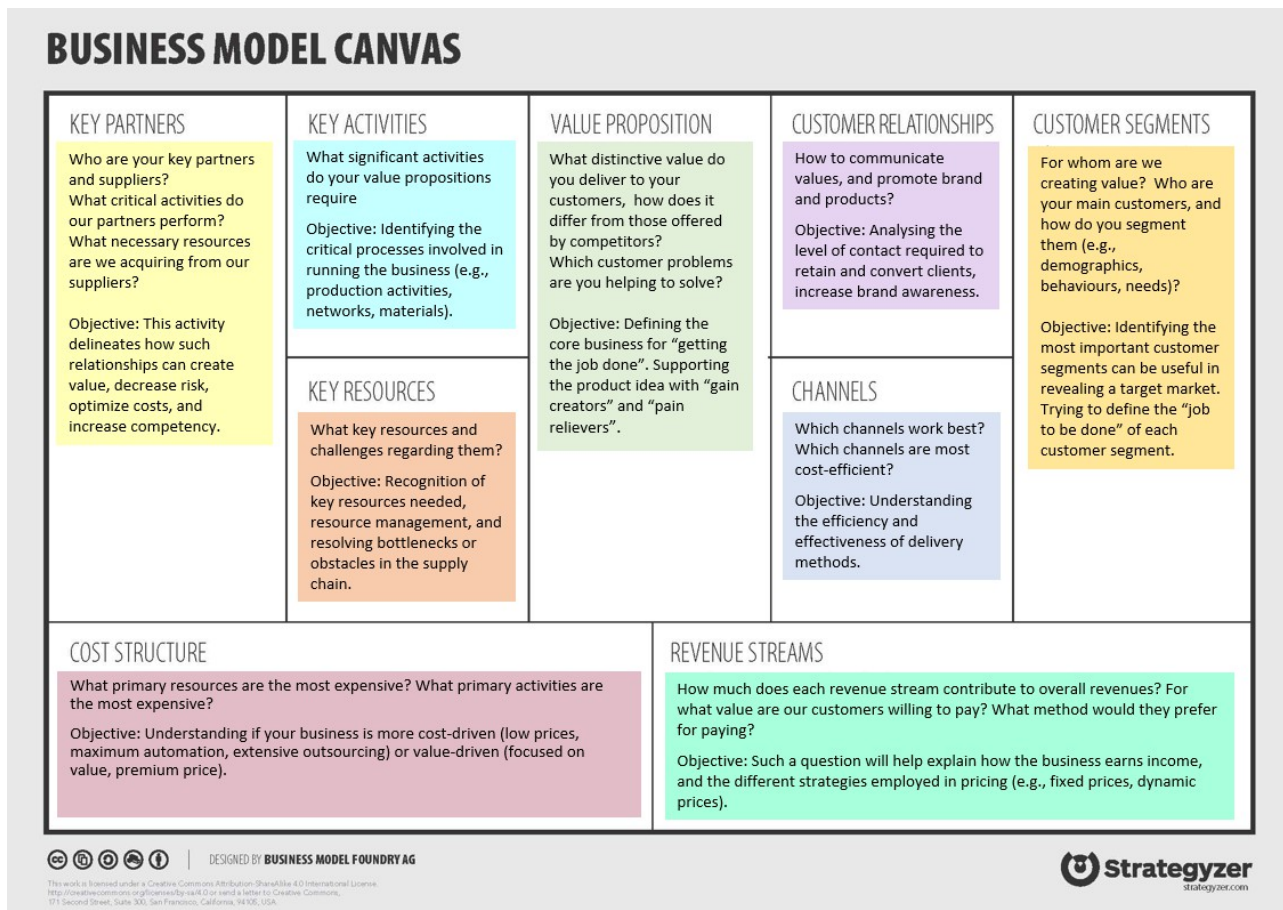
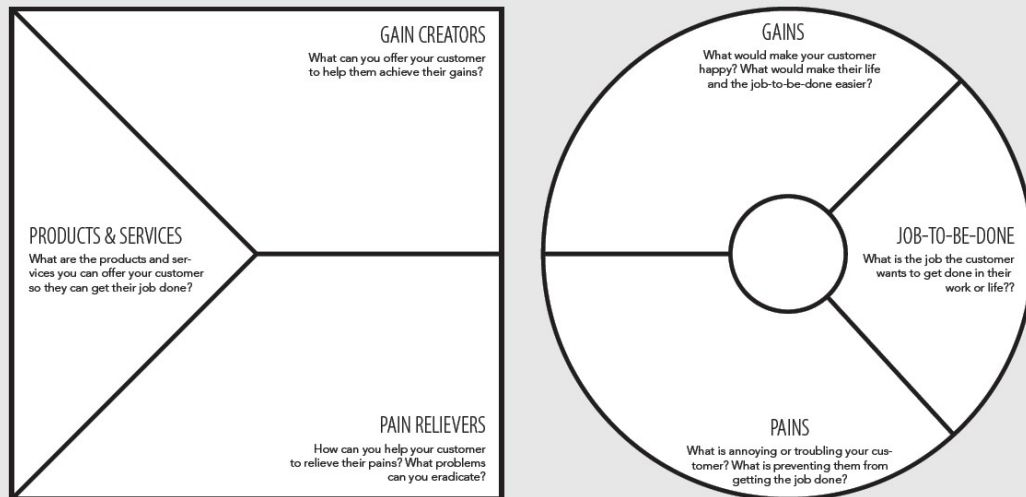


Figure 1. Business Model Canvas (Osterwalder & Pigneur, 2009; strategyzer.com)

To design products or services for customers, it is recommended to begin planning the business model from the value proposition. The value proposition emphasizes delivering unique benefits to customers. To support and facilitate this process, the Value Proposition Canvas (VPC) was developed (Osterwalder et al., 2014). The VPC consists of two components: the Value Map and the Customer Profile. The Value Map provides a structured and detailed illustration of the key attributes of a value proposition, breaking it down into products and services, pain relievers, and gain creators. On the other hand, the Customer Profile focuses on a specific customer segment, offering a detailed breakdown of the customer's jobs, pains, and gains (see Figure 2).

VALUE PROPOSITION CANVAS



BUSINESS MODEL FOUNDRY AG

Strategyzer
strategyzer.com

Figure 2. The Value Proposition Canvas (Osterwalder, et al. 2014; strategyzer.com)

The BMC and VPC together guide businesses in developing products that align with customers' expectations. In this study, both tools were used for data collection and outlining the business strategies for sea fennel products.

2.2 Data collection

Data collection was carried out in two phases: **expert workshops and a stakeholder validation survey**. The first phase involved two separate workshops, each with the participation of 10-12 experts, with a focus on two types of sea fennel-based product development:

1. **Sea fennel-based food products:** This workshop focused on the potential of sea fennel in developing new food products and exploring its consumer acceptance.
2. **Sea fennel-based nutraceuticals:** This workshop brought together experts to explore the potential of sea fennel in the nutraceutical market, discussing its health benefits, formulations, and applications in supplements.

In each workshop, a moderator and an assistant were engaged to guide the discussion according to the components of BMC and VPC. Participants were asked to express their opinions verbally, and all ideas were captured on canvases using post-it notes (See Figure 3). Except for *Cost Structure* and *Revenue Streams*, all blocks of BMC were discussed.



Figure 3. Images from expert workshops

The **second stage** included the stakeholder validation survey. The question form used in this survey was prepared based on the information gathered during the workshops (See Annex 1 for the survey questions). Each question in the survey corresponded to one of the building blocks of the business model – except Cost Structure and Revenue Streams- and all items to be rated or ranked under the questions reflected the results of the workshops. The aim was to validate the findings from the workshops, ensuring that the proposed ideas and market potential for each concept were aligned with stakeholders' views. A total of thirteen stakeholders, including various experts such as farmers, public administrators, certifiers, retailers, and academics, responded to the survey.

3 Results

3.1 Sea fennel-based food products

The BMC for sea fennel-based food products, derived from workshop results and validated through the expert survey, is presented in Table 1. Answers are listed according to their level of importance within each block of the BMC. Quantitative results of the survey are given in Annex 2 in detail.

Table 1. BMC for sea fennel-based food products

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
✓ Processors ✓ Scientists and research institutions ✓ Promoters/Advertisers ✓ Farmers/Collectors ✓ Packaging companies ✓ Restaurants and/or chefs ✓ Distributors for delivering final products ✓ Certifiers for product verification ✓ Retailers for reaching targeted customers ✓ Schools ✓ Transporters	✓ Consumer education/product promotion ✓ Crop production ✓ Processing sea fennel into finished food products ✓ Promoting sea fennel products to chefs and restaurants ✓ Permanent supply of sea fennel through contracted farming ✓ Distribution of sea fennel food products ✓ Managing a professional website for online sales ✓ Planning and management of the collection of wild sea fennel ✓ Transportation of sea fennel	✓ Distinct taste and flavour ✓ High nutritional value (e.g., vitamin C) ✓ Healthy product ✓ A cultural value ✓ A sustainable food option	✓ Promotions through show cooking events ✓ Websites of companies with recipes and nutritional information of sea fennel ✓ Promotional events in supermarkets and gastronomies offering free tastings of sea fennel-based products ✓ Product labels with QR codes linked to websites providing information ✓ Newsletter campaigns ✓ Online assistance for ordering sea fennel products	✓ Chefs looking for innovative dishes ✓ Tasters of delicacies interested in niche/artisanal products ✓ Tourists interested in local foods ✓ Consumers interested in local foods ✓ Young consumers interested in healthy foods ✓ Middle-aged consumers interested in healthy foods ✓ Consumers interested in sustainable products ✓ Vegetarian and vegan consumers
	Key Resources		Channels	
	✓ Creative marketing teams ✓ Specialized teams for product development ✓ Resources for primary production ✓ Educational teams		✓ Specialty/healthy food/delicatessen shops ✓ Online sale ✓ Restaurants ✓ Shops located in tourist areas ✓ Supermarkets ✓ Food fairs ✓ Shops/kiosks in airports or harbours	

	about sea fennel ✓ Dedicated experts for e-commerce ✓ Laboratories ✓ Sensory panel to test proposed recipes ✓ Packaging materials			
Cost Structure			Revenue Streams	
-			-	

Value propositions: The most significant value propositions of sea fennel validated by experts were its distinct taste and flavour, high nutritional value (e.g., Vitamin C content), and potential as a healthy product. Additionally, the cultural value of sea fennel, reflecting traditional and local uses, and its promise as a sustainable food option, were highlighted among the key attributes.

Customer segments: Experts ranked chefs seeking innovative dishes and tasters of delicacies interested in niche/artisanal products as the top customer segments that can be interested in sea fennel-based food products. Tourists interested in local foods and consumers focused on locally

sourced products followed them. Additionally, young consumers and middle-aged consumers were mentioned by the experts, highlighting the demand for healthy products. Consumers interested in sustainable products and vegetarian/vegan consumers were the last groups indicated as potential consumer segments. These groups can be interested in sea fennel food products due to their prioritization of sustainability and plant-based choices.

Channels: The importance of channels varies across customer segments, but specialty/healthy food/delicatessen shops and online sales were ranked as the top two channels overall. Specialty/healthy food/delicatessen shops were deemed particularly important by chefs seeking innovative dishes and customers looking for local, healthy, and sustainable food options. Restaurants were considered important, especially for segments such as chefs, tourists, and tasters of delicacies. Supermarkets and food fairs were identified as key channels for middle-aged and young consumers interested in healthy foods, as well as vegetarian and vegan consumers. Shops and kiosks in airports or harbours were rated as less important channels.

Customer relationship: According to expert ratings, the most effective customer relationship included promotions through show cooking events, followed by websites offering recipes and nutritional information. Promotional events in supermarkets and gastronomies providing free tastings were also highly rated. While product labels with QR codes linked to informational websites were considered significant, other methods, such as newsletter campaigns and online assistance for ordering products, received lower ratings.

Key resources: Creative marketing teams for promoting sea fennel products and specialized teams for product development were ranked as the most crucial key resources for sea fennel-based food products. Resources needed for primary production (e.g., land, labour, and capital) and educational teams providing information about sea fennel followed them. Dedicated experts for e-commerce, laboratories for analysing and certifying nutritional content, and sensory panels for testing recipes were also mentioned as essential resources. Although packaging materials are necessary for preserving and presenting products, they are considered less important compared to other resources.

Key activities: Experts ranked consumer education and product promotion to consumers as the most important key activities for sea fennel-based food products. This was followed by crop production (involving growing and harvesting of sea fennel) and the processing of sea fennel into finished food products. Promoting sea fennel products to chefs and restaurants is also considered highly important. Other key activities, according to level of importance, are as follows: Ensuring a permanent supply of sea fennel through contracted farming, distributing products to various sales points, managing a professional website for online sales, planning and managing the collection of wild sea fennel, and transportation of sea fennel.

Key partners: The most important key partners were processors for transforming sea fennel into final products and scientists and research institutions for product optimization. Promoters and

advertisers, including food influencers and bloggers, were considered important for reaching consumers. Following, farmers and collectors, who source the sea fennel, were ranked as the other most important key partners. Packaging companies ensuring proper packaging, laboratories testing products, and transporters were ranked as less important compared to other partners, but remained important for the operational aspects of the business.

3.2 Sea fennel-based nutraceuticals

Similar to the previous section, the results obtained from the workshop and the survey were given in the BMC for sea fennel-based nutraceuticals (Table 2). Answers are listed according to their level of importance within each block. See Annex 3 for the detailed survey results.

Table 2. BMC for sea fennel-based nutraceuticals

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
✓ Food processors ✓ Farmers/Collectors ✓ Scientists and research ✓ Seed producers ✓ Pharma companies ✓ Nutraceutical labs ✓ Certifiers ✓ Cosmetic companies ✓ Packaging/capsul companies	✓ Product formulation (research & development) ✓ Certification (e.g., organic, health claims) ✓ Quality control ✓ Intellectual property (IP) protection of formulation ✓ Packaging	✓ The organic and sustainable production of sea fennel ✓ Vitamin C content ✓ Anti-diabetic properties ✓ Providing nourishment for healthy skin ✓ Anti-aging properties ✓ Weight loss benefits of sea fennel	✓ Providing guidance through nutritionists ✓ Informing consumers through health specialists ✓ Promotion of the product benefits by influencers or brand ambassadors ✓ Online communities or forums where consumers can share experience ✓ In-store consultations by health professionals or experts	✓ Healthy food lovers ✓ Sports people interested in improving their performance/recovery ✓ People suffering from illness ✓ Food innovators interested in new tastes/ingredients ✓ Women interested in healthy products
	Key Resources		Channels	

	✓ Production in suitable areas (e.g., regions with the right climate and land ✓ Qualified workers with expertise ✓ Laboratories for testing product quality and safety ✓ Seed production ✓ Processing facilities with adequate equipment (e.g., evaporators, freeze dryers		✓ Online sale ✓ Organic and other specialized shops ✓ Pharmacists ✓ Women communities ✓ Health centres ✓ Yoga centres ✓ Beauty/hair salons	✓ Mothers supporting their children's health ✓ Students seeking quick and affordable supplements
Cost Structure		Revenue Streams		
-		-		

Value propositions: The results highlighted several key benefits of sea fennel as a nutraceutical, with the most valued properties being organic and sustainable production, which can align with consumer demand for environmentally responsible and natural ingredients in nutraceutical products and high vitamin C content. Experts emphasized that sea fennel nutraceuticals can be

promoted for a healthier and more youthful lifestyle. Its anti-diabetic properties and skin-care abilities were mentioned as important value propositions. Additionally, its anti-aging and weight loss benefits were also pointed out.

Customer segments: Healthy food lovers were indicated as the potentially most interested consumer segment for sea fennel-based nutraceuticals, followed by sports enthusiasts focusing on their performance and recovery. In addition, individuals suffering from illness, food innovators seeking new ingredients, and women interested in healthy products were ranked among the key groups. While mothers supporting their children's health and students seeking quick, affordable supplements are also relevant, they were ranked less important in the validation survey.

Channels: Online sales and organic or specialized shops were rated as the most crucial channels for all customer segments. However, for consumers suffering from health conditions, pharmacists emerged as the primary channel, followed by online sales and health centres. Although other channels, including women's communities, yoga centres, and beauty/hair salons were considered as significant channels during the workshops, they were ranked less important during the expert validation.

Customer relationships: The results revealed that nutritionists and health specialists can help build strong customer relationships and effectively market sea fennel as a nutraceutical. Detailed information on the product's benefits, ingredients, and personalized recommendations provided by experts was considered crucial to build a trust-based customer relationship. Promotion of product benefits by influencers or brand ambassadors was rated next, as they effectively engage with a wide audience and build brand credibility. Although online communities or forums, where consumers can share experiences, and in-store consultations by health professionals or experts were mentioned as important, they received lower ratings compared to other options in the expert survey.

Key resources: The most important key resource for sea fennel-based nutraceuticals included production in suitable areas, such as regions with the right climate and land, ensuring optimal growth conditions. Qualified workers with specialized expertise were ranked in the second place as they are needed for the product development and process. Additionally, laboratories for testing product quality and safety were mentioned in key resources to ensure that the final product meets necessary standards. Despite their lower ranking in the survey, seed production for the sustainable growth of the sea fennel market and processing facilities equipped with advanced equipment, such as evaporators and freeze dryers, were also considered among the key resources.

Key activities: Product formulation (research and development) and certification were ranked as primary activities to ensure high-quality, safe, and regulatory-compliant sea fennel-based nutraceuticals. These are followed by quality control and intellectual property (IP) protection of formulations to maintain a competitive advantage. Product packaging was ranked as less important compared to other activities.

Key partners: Food processors, who transform the sea fennel into final products, and farmers/collectors, who source the raw material, were determined as the most important key partners in developing sea fennel-based nutraceuticals. They are followed by the scientists and research institutions contributing to product optimization. Additionally, seed producers can ensure a consistent, high-quality seed supply, and pharma companies can play a key role in distributing nutraceuticals. Finally, nutraceutical labs for testing, formulating, and optimizing products, certifiers ensuring product quality and compliance with standards, cosmetic companies developing beauty and skincare products, and packaging/capsule companies responsible for ensuring proper packaging were mentioned among the other key partners.

4 Conclusion

In this study, BMCs and VPCs for both “sea fennel-based food products” and “sea fennel-based nutraceuticals” markets were generated based on the findings of stakeholder workshops. In addition, these preliminary models are revised through an online expert validation survey.

Sea fennel has a distinctive taste and flavour with high nutritional value. It is a healthy product containing valuable compounds. These properties should be considered as principal value propositions for attracting the attention of different consumer segments and gaining an advantage in the food market. The target consumer groups for sea fennel-based food products include innovative chefs, health-conscious consumers, gourmet enthusiasts, and tourists. Distribution channels like specialty/health food shops, online platforms, and restaurants will increase visibility and stimulate demand. These products are expected to be most effectively promoted to consumers through show cooking events, free tasting opportunities, creation of websites containing recipes and nutritional information, and informative packaging such as those with QR codes. Successful development of the sea fennel-based foods market requires raising consumer awareness, laboratory testing, and agricultural partnerships to ensure supply chain reliability. Addressing the existing awareness gap through creative marketing and forming strategic partnerships along the supply chain, from primary crop production to final product optimisation, will be essential for the development of the sea fennel market.

Concerning the nutraceutical market, the most prominent value proposition of sea fennel is its organic and sustainable production. Therefore, maintaining and improving these properties of sea fennel production as well as communicating this information to consumers are of crucial importance to align with consumers' increasing demand for environmentally responsible and natural ingredients in nutraceutical products. Furthermore, the high vitamin C content, anti-diabetic properties, skin care abilities, anti-ageing, and weight loss benefits of sea fennel should be highlighted in product development and promotion. Although sea fennel-based nutraceutical products appeal to different consumer segments, potential consumers of these products include those who prioritise health and wellness. Distribution should focus on organic or specialized stores, online channels, and pharmacies. Information on the product's benefits and ingredients, as well as personalized recommendations given by the nutritionists and health specialists, can help



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build strong customer relationships. An adequate supply of sea fennel in terms of quantity and quality, qualified staff, and quality and safety testing laboratories are essential for the business. The formulation of products (R&D) is of great importance for the success.

References

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<https://www.strategyzer.com/library/the-value-proposition-canvas> (last visit 23/04/2025)

Annex 1. Expert validation survey question form

Dear Participant,

We invite you to a short survey evaluating the Business Model Canvas (BMC) for innovative sea fennel products. The BMC is a strategic tool that helps visualize key components to describe, design, and communicate the business logic. In this survey, we ask for your feedback on the key success factors for introducing sea fennel into the market as a food and/or nutraceutical product. Each question corresponds to a component of the BMC. You will find pre-defined options based on results from previous expert workshops. Please indicate your opinion for each question. Thank you for your valuable contribution!

1st Part Food

Welcome to the first part of the survey. Please answer each question in the context of sea fennel FOOD products.

What makes sea fennel valuable for producing food products? Please rate your level of agreement with the following value propositions for sea fennel food products.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Sea fennel has a distinct taste and flavor					
Sea fennel has high nutritional value (e.g., vitamin C)					
Sea fennel is a healthy product					
Sea fennel has a cultural value					
Sea fennel is a sustainable food option					

In your opinion, who are the current/potential customers of sea fennel food products? Please rank the following customer segments based on their potential interest in sea fennel food products. Select and then rank them by clicking the arrows to move each item up and down, with the top option being the most important segment.

- _____ Tourists interested in local foods
- _____ Tasters of delicacies interested in niche/artisanal products
- _____ Chefs looking for innovative dishes
- _____ Middle-aged consumers interested in healthy foods
- _____ Young consumers interested in healthy foods
- _____ Consumers interested in local foods
- _____ Vegetarian and vegan consumers
- _____ Consumers interested in sustainable products

Which marketing channels will be the best to reach tourists? Please choose the two most suitable channels for distributing sea fennel food products to the tourist segment.

- ☐ Specialty/healthy food/delicatessen shops
- ☐ Shops located in tourist areas
- ☐ Shops/kiosks in airports or harbors
- ☐ Online sale
- ☐ Supermarkets
- ☐ Food fairs
- ☐ Restaurants

Which marketing channels will be the best to reach tasters of delicacies? Please choose the two most suitable channels for distributing sea fennel food products to the tasters of the delicacies segment.

- ☐ Specialty/healthy food/delicatessen shops
- ☐ Shops located in tourist areas
- ☐ Shops/kiosks in airports or harbors
- ☐ Online sale
- ☐ Supermarkets
- ☐ Food fairs
- ☐ Restaurants

Which marketing channels will be the best to reach chefs? Please choose the two most suitable channels for distributing sea fennel food products to the chefs segment.

- ☐ Specialty/healthy food/delicatessen shops
- ☐ Shops located in tourist areas
- ☐ Shops/kiosks in airports or harbors
- ☐ Online sale
- ☐ Supermarkets
- ☐ Food fairs
- ☐ Restaurants

Which marketing channels will be the best to reach middle-aged consumers? Please choose the two most suitable channels for distributing sea fennel food products to the middle-aged consumer segment.

- ☐ Specialty/healthy food/delicatessen shops
- ☐ Shops located in tourist areas
- ☐ Shops/kiosks in airports or harbors
- ☐ Online sale
- ☐ Supermarkets
- ☐ Food fairs
- ☐ Restaurants

Which marketing channels will be the best to reach young consumers? Please choose the two most suitable channels for distributing sea fennel food products to the young consumer segment.

- ☐ Specialty/healthy food/delicatessen shops

- ☐ Shops located in tourist areas
- ☐ Shops/kiosks in airports or harbors
- ☐ Online sale
- ☐ Supermarkets
- ☐ Food fairs
- ☐ Restaurants

Which marketing channels will be the best to reach consumers interested in local foods? Please choose the two most suitable channels for distributing sea fennel food products to the consumers interested in local foods.

- ☐ Specialty/healthy food/delicatessen shops
- ☐ Shops located in tourist areas
- ☐ Shops/kiosks in airports or harbors
- ☐ Online sale
- ☐ Supermarkets
- ☐ Food fairs
- ☐ Restaurants

Which marketing channels will be the best to reach vegetarian and vegan consumers? Please choose the two most suitable channels for distributing sea fennel food products to vegetarian and vegan consumers.

- ☐ Specialty/healthy food/delicatessen shops
- ☐ Shops located in tourist areas
- ☐ Shops/kiosks in airports or harbors
- ☐ Online sale
- ☐ Supermarkets
- ☐ Food fairs
- ☐ Restaurants

Which marketing channels will be the best to reach consumers interested in sustainable products? Please choose the two most suitable channels for distributing sea fennel food products to consumers interested in sustainable products.

- ☐ Specialty/healthy food/delicatessen shops
- ☐ Shops located in tourist areas
- ☐ Shops/kiosks in airports or harbors
- ☐ Online sale
- ☐ Supermarkets
- ☐ Food fairs
- ☐ Restaurants

What types of relationships should be established or maintained with targeted customer segments? Please rate your level of agreement with the following customer relationship strategies for sea fennel food products.

	Strongly	Somewh	Neither	Somewh	Strongl
					y

	disagree	at disagre e	agree nor disagre e	at agree	agree
Promotional events in supermarkets and gastronomies offering free tastings of sea fennel- based products					
Promotions through show cooking events					
Online assistance for ordering sea fennel products					
Newsletter campaigns					
Websites of companies with recipes and nutritional information of sea fennel					
Product labels with QR codes linked to websites providing information					

In your opinion, what are the key resources needed to deliver the value proposition of sea fennel food products? Please rank the following resources based on their importance for the production and marketing of sea fennel food products. Select and then rank them by clicking the arrows to move each item up and down, with the top option being the most important resource.

- _____Resources for primary production (e.g., land, labor, and capital)
- _____Packaging materials for preserving and presenting final products
- _____Creative marketing teams for promoting sea fennel products
- _____Educational teams to provide information about sea fennel
- _____Specialized teams for product development
- _____Laboratories to analyze and certify the nutritional content
- _____Sensory panel to test proposed recipes (e.g. taste. texture)
- _____Dedicated experts for e-commerce

In your opinion, what key activities are needed to deliver the value proposition of sea fennel food products? Please rank the following key activities based on their importance for the successful production, processing, and distribution of sea fennel food products. Select and then rank them by clicking the arrows to move each item up and down, with the top option being the most important activity.

- _____Crop production (growing and harvesting sea fennel)
- _____Permanent supply of sea fennel through contracted farming
- _____Planning and management of the collection of wild sea fennel
- _____Transportation of sea fennel from one site to another
- _____Processing of sea fennel into finished food products
- _____Distribution of sea fennel food products to various sales points



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_____Consumer education/product promotion to consumers

- _____ Promoting sea fennel products to chefs and restaurants
 _____ Managing a professional website for online sales

In your opinion, who are the key partners? Please rank the following key partners based on their importance in the production and distribution of sea fennel food products. Select and then rank them by clicking the arrows to move each item up and down, with the top option being the most important partner.

- _____ Farmers/Collectors for sourcing sea fennel
 _____ Processors for transforming sea fennel into final products
 _____ Packaging companies for ensuring proper packaging
 _____ Certifiers for product verification according to relevant standards
 _____ Transporters for delivery of sea fennel
 _____ Distributors for delivering final products
 _____ Retailers for reaching targeted customers
 _____ Restaurants and/or chefs for introducing sea fennel products
 _____ Promoters/Advertisers for reaching consumers (e.g. food influencers, bloggers)
 _____ Scientists and Research institutions for product optimization
 _____ Laboratories for product testing
 _____ Schools for promoting sea fennel food products to students and their families

2nd Part Nutraceuticals

Welcome to the second part of the survey. Please answer each question in the context of producing NUTRACEUTICAL products derived from sea fennel.

Definition: "*Nutraceutical is a term coined from 'nutrition' and 'pharmaceutical', being defined as parts of a food or a whole food that have medical or health benefits including the prevention and treatment of disease*" (source: <https://www.sciencedirect.com/topics/food-science/nutraceutical>).

What makes sea fennel valuable for producing nutraceutical products? Please rate your level of agreement with the following value propositions for nutraceutical products derived from sea fennel.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Anti-aging properties					
The weight loss benefits of sea fennel					
Anti-diabetic properties					
Vitamin C content					
Providing nourishment for healthy skin					
The organic and sustainable production of sea					



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fennel

In your opinion, who are the current/potential customers of nutraceutical products derived from sea fennel? Please rank the following customer segments based on their potential interest in nutraceutical products derived from sea fennel. Select and then rank them by clicking the arrows to move each item up and down, with the top option being the most important segment.

- _____ Food innovators interested in new tastes/ingredients
- _____ Sports people interested in improving their performance/recovery
- _____ Healthy food lovers
- _____ Women interested in healthy products
- _____ Mothers supporting their children's health
- _____ Students seeking quick and affordable supplements
- _____ People suffering from illness

Which marketing channels will be the best to reach food innovators? Please choose the two most suitable channels for distributing nutraceutical products derived from sea fennel to the food innovators segment.

- ☐ Organic and other specialized shops
- ☐ Online sale
- ☐ Pharmacists
- ☐ Health centers
- ☐ Beauty/hair salons
- ☐ Yoga centers
- ☐ Women communities

Which marketing channels will be the best to reach sports people? Please choose the two most suitable channels for distributing nutraceutical products derived from sea fennel to the sportspeople segment.

- ☐ Organic and other specialized shops
- ☐ Online sale
- ☐ Pharmacists
- ☐ Health centers
- ☐ Beauty/hair salons
- ☐ Yoga centers
- ☐ Women communities

Which marketing channels will be the best to reach healthy food lovers? Please choose the two most suitable channels for distributing nutraceutical products derived from sea fennel to the health food lovers segment.

- ☐ Organic and other specialized shops
- ☐ Online sale
- ☐ Pharmacists
- ☐ Health centers
- ☐ Beauty/hair salons
- ☐ Yoga centers
- ☐ Women communities

Which marketing channels will be the best to reach women consumers? Please choose the two most suitable channels for distributing nutraceutical products derived from sea fennel to the women consumer segment.

- ☐ Organic and other specialized shops
- ☐ Online sale
- ☐ Pharmacists
- ☐ Health centers
- ☐ Beauty/hair salons
- ☐ Yoga centers
- ☐ Women communities

Which marketing channels will be the best to reach mothers? Please choose the two most suitable channels for distributing nutraceutical products derived from sea fennel to the mother consumer segment.

- ☐ Organic and other specialized shops
- ☐ Online sale
- ☐ Pharmacists
- ☐ Health centers
- ☐ Beauty/hair salons
- ☐ Yoga centers
- ☐ Women communities

Which marketing channels will be the best to reach students? Please choose the two most suitable channels for distributing nutraceutical products derived from sea fennel to the student consumer segment.

- ☐ Organic and other specialized shops
- ☐ Online sale
- ☐ Pharmacists
- ☐ Health centers
- ☐ Beauty/hair salons
- ☐ Yoga centers
- ☐ Women communities

Which marketing channels will be the best to reach people suffering from illness? Please choose the two most suitable channels for distributing nutraceutical products derived from sea fennel to the consumers suffering from illness.

- ☐ Organic and other specialized shops
- ☐ Online sale
- ☐ Pharmacists
- ☐ Health centers
- ☐ Beauty/hair salons
- ☐ Yoga centers
- ☐ Women communities

What types of relationships should be established or maintained with targeted customer segments?
Please rate your level of agreement with the following customer relationship strategies for nutraceutical products derived from sea fennel.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Providing guidance through nutritionists					
Informing consumers through health specialists					
Online communities or forums where consumers can share experiences					
Promotion of the product benefits by influencers or brand ambassadors					
In-store consultations by health professionals or experts					

In your opinion, what are the key resources needed to deliver the value proposition of sea fennel? Please rank the following resources based on their importance for the production and marketing of nutraceuticals derived from sea fennel. Select and then rank them by clicking the arrows to move each item up and down, with the top option being the most important resource.

- _____ Seed production
- _____ Production in suitable areas (e.g., regions with the right climate and land)
- _____ Qualified workers with expertise
- _____ Processing facilities with adequate equipment (e.g., evaporators, freeze dryers)
- _____ Laboratories for testing product quality and safety

In your opinion, what key activities are needed to deliver the value proposition of sea fennel? Please rank the following key activities based on their importance for the successful production, processing, and distribution of nutraceuticals derived from sea fennel. Select and then rank them by clicking the arrows to move each item up and down, with the top option being the most important activity.

- _____ Product formulation (research & development)
- _____ Quality control
- _____ Certification (e.g., organic, health claims)
- _____ Intellectual property (IP) protection of formulations
- _____ Packaging

In your opinion, who are the key partners? Please rank the following key partners based on their importance in the production and distribution of nutraceuticals derived from sea fennel. Select and then rank them by clicking the arrows to move each item up and down, with the top option being the most important partner.



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_____Farmers/Collectors for sourcing sea fennel

- _____ Food processors transforming sea fennel into final products
- _____ Packaging/capsule companies for ensuring proper packaging
- _____ Certifiers for verifying product quality and compliance with standards
- _____ Seed producers for a consistent and high-quality seed supply
- _____ Scientists and research institutions for product optimization
- _____ Nutraceutical labs in testing, formulating, and optimizing products
- _____ Pharma companies for distributing nutraceuticals
- _____ Cosmetic companies developing beauty and skincare products

Annex 2. Survey results for sea fennel-based food products

1. Ratings for value propositions of sea fennel

Options	1	2	3	4	5	Mean	Std. Deviation
Sea fennel has a distinct taste and flavor	-	-	1	3	9	4.62	0.65
Sea fennel has high nutritional value (e.g., vitamin C)	-	-	1	5	7	4.46	0.66
Sea fennel is a healthy product	-	-	-	7	6	4.46	0.52
Sea fennel has a cultural value	1	-	-	9	3	4.00	1.00
Sea fennel is a sustainable food option	-	2	1	9	1	3.69	0.86

Strongly disagree (1), Somewhat disagree (2), Neither agree nor disagree (3), Somewhat agree (4), Strongly agree (5)

2. Ranking of customer segments based on their potential interest in sea fennel-based food products

Options	1st	2nd	3rd	4th	5th	6th	7th	8th	Total Score*
Chefs looking for innovative dishes	2	3	-	3	3	2	-	-	70
Tasters of delicacies interested in niche/artisanal products	3	1	2	3	2	-	1	1	69
Tourists interested in local foods	2	3	2	-	2	1	1	2	64
Consumers interested in local foods	2	1	3	1	-	3	2	1	60
Young consumers interested in healthy foods	-	3	1	1	5	1	-	2	57
Middle-aged consumers interested in healthy foods	1	2	2	1	1	2	2	2	55
Consumers interested in sustainable products	1	-	2	3	-	2	3	2	49
Vegetarian and vegan consumers	2	-	1	1	-	2	4	3	44

*Sum of ranks reversed

3. Best marketing channels according to customer segments

Options	Tourists interested in		Tasters of delicacies interested in		Chefs looking for		Middle-aged consumers interested in		Young consumers interested in		Consumers interested in local foods		Vegetarian and vegan		Consumers interested in sustainable		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Specialty / healthy food/ delicatessen shops	2	14.3	2	16.7	4	44.4	1	10.0	2	25.0	3	27.3	2	40.0	2	33.3	18	24.0
Online sale	2	14.3	3	25.0	1	11.1	3	30.0	2	25.0	2	18.2	1	20.0	2	33.3	16	21.3
Restaurants	4	28.6	3	25.0	3	33.3	1	10.0	1	12.5	1	9.1	-	-	-	-	13	17.3
Shops located in	4	28.6	2	16.7	-	-	2	20.0	-	-	2	18.2	-	-	-	-	10	13.3

tourist areas																		
Supermarkets	-	-	1	8.3	-	-	1	10.0	2	25.0	1	9.1	1	20.0	2	33.3	8	10.7
Food fairs	1	7.1	1	8.3	1	11.1	2	20.0	1	12.5	1	9.1	1	20.0	-	-	8	10.7
Shops/kiosks in airports or harbors	1	7.1	-	-	-	-	-	-	-	-	1	9.1	-	-	-	-	2	2.7
Total response	14	100	12	100	9	100	10	100	8	100	11	100	5	100	6	100	75	100

4. Ratings of customer relationship

Options	1	2	3	4	5	Mean	Std. Deviation
Promotions through show cooking events	-	-	-	7	6	4.46	0.52
Websites of companies with recipes and nutritional information of sea fennel	-	1	-	6	6	4.31	0.86
Promotional events in supermarkets and gastronomies offering free tastings of sea fennel-based products	-	-	2	6	5	4.23	0.73
Product labels with QR codes linked to websites providing information	1	-	2	4	6	4.08	1.19
Newsletter campaigns	-	1	4	4	4	3.85	0.99
Online assistance for ordering sea fennel products	-	-	7	2	4	3.77	0.93

Strongly disagree (1), Somewhat disagree (2), Neither agree nor disagree (3), Somewhat agree (4), Strongly agree (5)

5. Ranking of key resources based on importance

Options	1st	2nd	3rd	4th	5th	6th	7th	8th	Total Score*
Creative marketing teams for promoting sea fennel products	4	2	3	-	3	1	-	-	79
Specialized teams for product development	3	3	4	1	-	1	1	-	79
Resources for primary production (e.g., land, labor, and capital)	2	4	1	-	1	1	1	3	62
Educational teams to provide information about sea fennel	2	1	1	3	1	3	1	1	60
Dedicated experts for e-commerce	1	2	1	2	2	1	-	4	53
Laboratories to analyze and certify the nutritional content	-	-	3	2	3	2	2	1	51
Sensory panel to test proposed recipes (e.g. taste. Texture	1	-	-	2	2	3	4	1	44
Packaging materials for preserving and presenting final products	-	1	-	3	1	1	4	3	40

*Sum of ranks reversed

6. Ranking of key activities based on importance

Options	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	Total Score*
Consumer education/product promotion to consumers	2	2	1	2	3	2	-	1	-	78
Crop production (growing and harvesting sea fennel)	5	1	-	2	-	-	1	3	1	75
Processing of sea fennel into finished food products	-	4	3	1	2	-	-	2	1	74
Promoting sea fennel products to chefs and restaurants	1	2	2	2	1	1	2	-	2	68
Permanent supply of sea fennel through contracted farming	3	-	1	1	-	4	2	2	-	66
Distribution of sea fennel food products to various sales points	-	-	3	1	5	1	3	-	-	65
Managing a professional website for online sales	1	-	3	3	1	-	1	2	2	62

Planning and management of the collection of wild sea fennel	-	3	-	1	1	2	3	1	2	56
Transportation of sea fennel from one site to another	1	1	-	-	-	3	1	2	5	41

*Sum of ranks reversed

7. Ranking of key partners based on importance

Options	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	Total Score*
Processors for transforming sea fennel into final products	1	3	3	-	3	2	-	-	-	1	-	-	116
Scientists and research institutions for product optimization	2	5	-	1	1	-	1	1	1	-	1	-	113
Promoters/Advertisers for reaching consumers (e.g. food influencers. bloggers)	3	-	1	1	3	1	3	1	-	-	-	-	109
Farmers/Collectors for sourcing sea fennel	3	1	3	1	-	1	1	-	-	1	1	1	105
Packaging companies for ensuring proper packaging	-	1	1	1	-	4	-	4	-	2	-	-	84
Restaurants and/or chefs for introducing sea fennel products	1	-	2	1	1	-	2	1	2	-	1	2	78
Distributors for delivering final products	1	1	1	2	-	-	-	1	3	1	2	1	76
Certifiers for product verification according to relevant standards	1	-	-	1	1	2	1	1	3	2	1	-	74
Retailers for reaching targeted customers	-	1	1	2	1	-	-	2	1	1	3	1	71
Schools for promoting sea fennel food products to students and their families	1	1	-	-	-	2	2	-	2	2	1	2	67
Laboratories for product testing	-	-	1	1	1	1	1	2	1	-	2	3	61
Transporters for delivery of sea fennel	-	-	-	2	2	-	2	-	-	3	1	3	60

*Sum of ranks reversed

Annex 3. Survey results for sea fennel-based nutraceuticals

1. Ratings for value propositions of sea fennel

Options	1	2	3	4	5	Mean	Std. Deviation
The organic and sustainable production of sea fennel	-	-	2	6	5	4.23	0.73
Vitamin C content	-	-	3	5	5	4.15	0.80
Anti-diabetic properties	-	-	5	5	3	3.85	0.80
Providing nourishment for healthy skin	-	-	5	5	3	3.85	0.80
Anti-aging properties	-	1	4	5	3	3.77	0.93
Weight loss benefits of sea fennel	-	1	5	5	2	3.62	0.87

Strongly disagree (1), Somewhat disagree (2), Neither agree nor disagree (3), Somewhat agree (4), Strongly agree (5)

2. Ranking of customer segments based on their potential interest in sea fennel-based nutraceuticals

Options	1st	2nd	3rd	4th	5th	6th	7th	Total Score*
Healthy food lovers	3	3	3	3	-	-	1	67
Sports people interested in improving their performance/recovery	3	3	1	2	1	3	-	61
People suffering from illness	4	1	-	2	4	1	1	57
Food innovators interested in new tastes/ingredients	1	2	5	-	1	3	1	54
Women interested in healthy products	2	-	3	3	4	-	1	54
Mothers supporting their children's health	-	1	-	3	2	5	2	36
Students seeking quick and affordable supplements	-	3	1	-	1	1	7	35

*Sum of ranks reversed

3. Best marketing channels according to customer segments

Options	Food innovators interested in		Sports people interested in improving their performance/recovery		Healthy food lovers		Women interested in healthy		Mothers supporting their		Students seeking quick and		People suffering from		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Online sale	7	43.8	6	46.2	6	37.5	4	40.0	1	50.0	3	42.9	3	30.0	30	40.5
Organic and other specialized shops	6	37.5	4	30.8	6	37.5	3	30.0	1	50.0	3	42.9	1	10.0	24	32.4

Pharmacists	3	18.8	2	15.4	1	6.3	-	0.0	-	0.0	-	0.0	4	40.0	10	13.5
Women communities	-	0.0	1	7.7	2	12.5	1	10.0	-	0.0	1	14.3	-	0.0	5	6.8
Health centres	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	2	20.0	2	2.7
Yoga centers	-	0.0	-	0.0	1	6.3	1	10.0	-	0.0	-	0.0	-	0.0	2	2.7
Beauty/hair saloons	-	0.0	-	0.0	-	0.0	1	10.0	-	0.0	-	0.0	-	0.0	1	1.4
Total response	16	100	13	100	16	100	10	100	2	100	7	100	10	100	74	100

4. Ratings of customer relationship

Options	1	2	3	4	5	Mean	Std. Deviation
Providing guidance through nutritionists	-	-	1	3	9	4.62	0.65
Informing consumers through health specialists	-	-	1	3	9	4.62	0.65
Promotion of the product benefits by influencers or brand ambassadors	-	-	-	5	8	4.62	0.51
Online communities or forums where consumers can share experiences	-	-	2	7	4	4.15	0.69
In-store consultations by health professionals or experts	-	-	3	6	4	4.08	0.76

Strongly disagree (1), Somewhat disagree (2), Neither agree nor disagree (3), Somewhat agree (4), Strongly agree (5)

5. Ranking of key resources based on importance

Options	1st	2nd	3rd	4th	5th	Total Score*
Production in suitable areas (e.g., regions with the right climate and land)	7	3	-	2	1	52
Qualified workers with expertise	2	4	2	4	1	41
Laboratories for testing product quality and safety	-	4	4	2	3	35
Seed production	3	-	4	1	5	34
Processing facilities with adequate equipment (e.g. evaporators, freeze dryers)	1	2	3	4	3	33

*Sum of ranks reversed

6. Ranking of key activities based on importance

Options	1st	2nd	3rd	4th	5th	Total Score*
Product formulation (research&development)	8	-	2	3	-	52
Certification (e.g., organic, health claims)	2	6	1	3	1	44
Quality control	2	4	5	-	2	43
Intellectual property (IP) protection of formulations	1	2	2	4	4	31
Packaging	-	1	3	3	6	25

*Sum of ranks reversed

7. Ranking of key partners based on importance

Options	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	Total Score*
Food processors transforming sea fennel into final products	1	5	1	4	-	1	-	-	1	85
Farmers/Collectors for sourcing sea fennel	5	-	2	1	1	-	-	4	-	78
Scientists and research institutions for product optimization	1	1	4	1	-	3	2	1	-	71
Seed producers for a consistent and high-quality seed supply	3	1	2	1	1	1	-	-	4	68
Pharma companies for distributing nutraceuticals	-	2	2	1	1	3	2	1	1	62
Nutraceutical labs in testing, formulating, and optimizing products	-	2	1	1	3	1	3	2	-	61
Certifiers for verifying product quality and compliance with standards	1	1	-	1	3	2	2	1	2	56

Cosmetic companies developing beauty and skincare products	1	1	-	3	-	1	3	3	1	55
Packaging/capsule companies for ensuring proper packaging	1	-	1	-	4	1	1	1	4	49

*Sum of ranks reversed