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Herb Sector in Greece: Training Needs and Perspectives

Aikaterini Paltaki[1]*, Evropi-Sofia Dalampira[1], Dimitra Lazaridou[1], Anastasios Livadiotis[2], Smaragda Nikouli[2], Anastasios Michailidis[1], Sona Telunts[3], Tamar Sargsyan[3], Oxana Paladiciuc[4], Roman Curca[4], and Natia Gelashvili[5]

[1]Department of Agricultural Economics, Aristotle University of Thessaloniki, Thessaloniki, Greece
[2]Development Association of Halkidiki S.A., Poligiros, Halkidiki, Greece
[3]Center for Agribusiness and Rural Development (CARD) Foundation, Yerevan, Republic of Armenia
[4]Organization for small and medium enterprises sector development (ODIMM), Moldova
[5]Georgian Farmers' Association, Georgia

Abstract.

The Greek flora is rich in native herbaceous plants and due to the Mediterranean climate, there are optimal climatic and soil conditions for their cultivation. Herbs play a very important role in the Greek rural economy and facilitate change in the national agro-food sector as it is still developing. In recent years, this sector has become an area of interest. Many farmers changed their old crops into new cultivations like herbs. This development requires investments, training programs, new studies, and projects in order to enrich the knowledge and skills of all the participants involved in the value chain. HEGO is a Black Sea Project, funded by the European Union, and one of its main goals is the modernization of enterprises associated with the cultivation, production, and promotion of diversified, sustainable, value-added herb products, as well as the enhancement of cross-border trade opportunities for local herb enterprises in participating Black Sea Basin countries (Greece, Moldova, Georgia, and Armenia). This paper explores the current situation of the herb sector in Greece regarding the cultivation, processing legislation, managerial issues, and the trade value of herb products. More specifically, its purpose is to investigate the current skills and expertise in herbs of the participants in Greece. Additionally, this paper explores the future training needs in relation to the above mention topics. Descriptive statistics, SWOT, and PEST analysis were performed. The main results of this research revealed the lack of knowledge of wildcrafting practices and trading. The importance of further training was highlighted, especially in marketing and trading skills. These findings can be used to develop training curricula and courses in order to cope with potential threats in the herb sector in Greece.

Keywords: herbs, Greece, training needs, skills, knowledge

jel CLASSIFICATION codes

I2, O13, Q1

Corresponding Author: Aikaterini Paltaki; email: apaltaki@agro.auth.gr

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1. INTRODUCTION

Recently farmers are shifting towards new alternative crops, environmentally friendly while consumers search for products with valuable properties and sustainable production methods. Herbs are a new trend gaining more and more interest from people [10].

The healing properties of herbs have been extensively described across history and cultures [2]. The use of herbs in Greece has its roots in ancient times. During the Hippocratic Corpus (5^{th} – 2^{nd} century B.C., Greece), almost 380 medicinal herbs useful for various illnesses were recorded [12]. Greece has a long ethnopharmacological tradition derived from the extended use of aromatic plants throughout the country in a wide range of habitats. The Mediterranean Basin is considered a "Global biodiversity hotspot" and the largest of the world's five Mediterranean-type climatic regions [15]. The geographical position of Greece, its geomorphology, and the coexistence and interaction of biotic and non-biotic factors have marked Greece as a country of high plant diversity and endemism [16]. The growth of aromatic plants is supported by the high local plant diversity and the Greek landscape with many mountainous and insular systems [6]. Aromatic and medicinal plants offer therapeutic and environmental benefits but also have an important role in the Greek rural economy [15].

The flora of Greece comprises more than 6,600 taxa (species and subspecies) [4] and 20% of these are aromatic-medicinal plants (1,300) [10]. Greece has 1,490 endemic plants of which, 15% are endemic species of aromatic-medicinal plants [10]. The most important plant family of aromatic-medicinal plants in Greece is the Lamiaceae. It includes many known species such as sages, thymes, lavenders, mountain teas, and oreganos [3]. According to the Greek Ministry of Rural Development and Food, the crops with the largest cultivated areas in Greece are mastic trees, origanum, lavender, and mountain tea. Table 1 presents those areas and their changes during the period 2015-2018.

TABLE 1: Aromatic-medicinal plants and their cultivated areas in Greece during 2015-2018.

Aromatic-Medicinal Plants	**Cultivated Area (ha)**			
	2015	2016	2017	2018
Mastic Trees	6,188	6,082	6,080	6,124
Origanum	7,299	8,702	11,986	12,360
Lavender	2,984	3,628	5,431	6,464
Mountain Tea	2,496	3,007	4,084	4,285

Source: http://www.minagric.gr/index.php/el/the-ministry-2/statistikes-tekmhrioshs/8510-statistika-ekt-parag-fytikonproionton

Greek oregano is regarded among the best in the world and it is very popular in the European markets for food [15]. Moreover, among the oregano herbs, there is a species *Origanum onites* L. which can be found only in three countries and Greece (southern Greece and Crete) is among them [17]. It is a very popular herb and is traded as a spice for culinary purposes. It is distinguished from other oregano herbs because of the very high carvacrol content (90% of the total essential oil) and considerable amounts of borneol [18].

Sideritis scardica is an endemic species of the Central Balkan Peninsula and its distribution is restricted to Greece, Bulgaria, North Macedonia, Albania, Serbia, and Turkey [11]. In Greece, the species is distributed mostly to the North and North-Eastern parts of the country. A comparison between the Greek Sideritis scardica from Mountain Olympus and the Bulgarian from the Pirin Mountains and Slavyanka revealed that the populations from Olympus Mountain had better characteristics [1]. This herb is used to relieve sinus congestion, sore throats, pains, and virus infections. It has many activities such as antimicrobial, antioxidant, analgesic, sedative, stomachic, and antispasmodic [13].

The culture and production of aromatic plants are influenced by the developments in Common Agricultural Policy (CAP) during the period 2007-2013, as a great number of farmers shift their crops to growing herbs. Herbs are low-maintenance crops, which appear to be of low demand for their irrigation and are favoured by the Mediterranean climate conditions of Greece and the Greek biodiversity [16].

The traded parts of herbs are mainly dried plant parts, leaves, roots, flowers, seeds, bark, and even the whole plant [7] or sometimes calyces and styles [12]. The traded plant material that is not or little processed is generally much cheaper than those that have been processed, like rubbed, powdered, or extracted (essential oils) [7]. Many herb shops can be found in the markets of Greek cities. Nowadays the trade of herbs in Greece is held in different market spots such as,

1. Traditional shops that exist since the 15^{th} century. These shops are mostly a family business and the owners are traders, but they may collect some of the herbs. They are able to suggest specific herbs for common ailments. Their primary suppliers are professional collectors. Traditional shops are usually old and they sell not packaged herbs but stored in big fabric bags.

2. Modern shops have opened more recently in the last decade due to the increased demand for natural products and health care. The owners' knowledge and information about herbs come from the company suppliers or modern textbooks. These shops are modernly decorated. The herbs are displayed in attractive packages.

3. Stalls in open-air markets take place once a week in different spots of the city. Stall keepers usually collect all the herbs and they can recommend tips for herbal medicine based on empirical experience and tradition. Herbs are sold in bunches or crushed in small pouches [5].

Aromatic and medicinal plants represent the largest natural resource used for their properties, in the continuously developing international market of plant-based cosmetics, spices, medicine, and health products [3]. According to Barata et al. [2], 60,000 species of aromatic and medicinal plants are used globally and more than 500,000 tons of materials from those species are traded every year. One of the main concerns in Greece and globally is the uncontrollable harvest of wild herbs which results in a severe decrease in the population of these species [7]. According to Schippmann et al. [14], 15,000 species are endangered due to overharvesting. If this situation continues the number of endangered species will be uncontrollable.

This paper is part of one of the main Deliverables of the project's first work package: Market Research for the current situation and training needs in the herb sector. The main aim of this study is to describe the current situation of the herb sector in Greece and to identify the training needs of end-users from several target groups (farmers, advisors, collectors, SMEs, public authorities, organizations, etc.). This research has been performed under the Deliverable "Market Research Surveys' Integrated Database" and aims at providing the final common findings, conclusions, and suggestions/recommendations on the training needs of herb products in Greece.

The remainder of this paper is organized as follows. The methodology section describes the research on data collection, the designer of the questionnaire, as well as the methodology followed. The next section presents the results of the analysis. Finally, there are the conclusions of the study.

2. Methodology

This research is one of the main deliverables of the HEGO project's first work package (WP): Market Research for the current situation and training needs in the herb sector.

Market Research Survey has been performed, one in each Project country, with stakeholders from several target groups (farmers, advisors, collectors, SMEs, public authorities, organizations, etc.). In this paper, there will be presented the Greek survey. Its goal was to identify: (a) the current situation in Greece regarding the collection/cultivation, processing, and promotion practices used for herb products, (b) the current skills and expertise towards herbs of the Greek participants, and (c) the specific future training needs of end-users of Project Outputs in relation to the above-mentioned topics.

During this research, both quantitative and quantitative instruments have been performed [8]. The research in Greece was conducted from March 17^{th} till April 5^{th} 2021. The questionnaire was developed and completed by 30 responders.

The collection method was face-to-face/personal interviews with closed format questions and pre-defined, prompted possible answers, rated on a 5 Likert scale. The qualitative analysis for this deliverable will be descriptive statistics (frequencies, percentages, and mean values), SWOT analysis, and PEST analysis. The collected national data were gathered in data excel files and were statistically analyzed using the SPSS for Windows (ver. 27). The survey instruments were based on a previous work of [19].

3. results

Survey's two main target groups were farmers and herb collectors who comprised 60% of the total sample. The remaining 40% belongs to the other target groups shown in Figure 1.

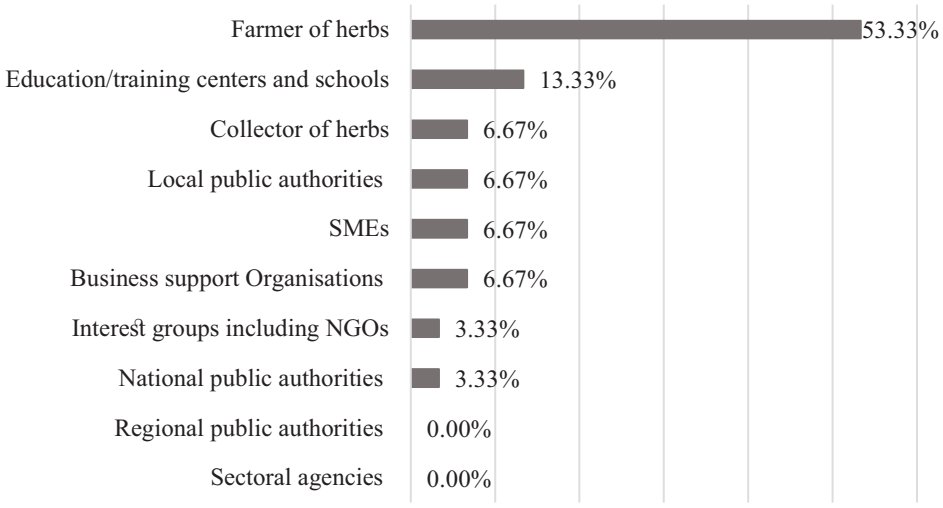

Figure 1: Distribution of the survey sample.

According to all participants, current skills and expertise in herbs are higher in the knowledge of cultivation needs, cultivation practices, and processing techniques, with mean values of 3.87, 3.57 and 3.50 respectively. On the contrary, their skills are lower in wildcrafting practices and trading, with mean values of 2.83 and 3.03 respectively. Table 2 presents the mean values and standard deviation of different skills and expertise.

Table 2: The current level of skills and expertise in herbs.

Skills and expertise	Mean Value	St. deviation
Cultivation practices (planting, irrigation, fertilization, weed and pest control, harvesting, propagation)	3.57	1.07
Knowledge of cultivation needs (from planting to harvesting)	3.87	1.22
Wildcrafting practices (do you implement these methods of harvesting?)	2.83	1.34
Knowledge of ethical wildcrafting (improve the process, follow regulations and make it more sustainable and environmental- friendly)	3.37	1.30
Knowledge of the biodiversity conservation of endemic herb plant species (do you know that many endemic herb plants are forbidden to harvest as they are protected, and red-listed?)	3.47	1.33
Knowledge about the ecology and sustainable management methods of herb species	3.37	1.45
Processing techniques (drying herbs, herbal mixtures, distillation, extracts, food products etc.)	3.50	1.38
Technological expertise (like value chain, precision agriculture, innovations, application of technology in the cycle of production etc.)	3.13	1.22
Trading skills (marketing skills, certification etc.)	3.03	1.27
Business management skills (value chain development, legislative expertise, finance etc.)	3.17	1.42

Figure 2 visualizes the results with a word cloud. The higher the mean value a variable has the bigger it appears in the word cloud. The majority of the participants agree that they prefer the cultivation over the collection of herbs ("collection of herbs" refers to the collection of herbs from the wild/nature). They agreed that the cultivation of herbs protects endangered species while the collection of herbs threatens the sustainability of the environment. It is worth mentioning that there is an absolute agreement that the cultivation of herbs requires relevant education and training.

Future needs in training towards herbs should target the gain of managerial-commercial skills (4.15 mean value) and legislative skills (3.81 mean value), whereas cultivation practices skills were graded as a lesser necessity (3.19 mean value) (Figure 3). The next figure summarizes the averages of those mean values in ascending order.

Figure 2: Word cloud about the cultivation over the collection of herbs from the wild/nature.

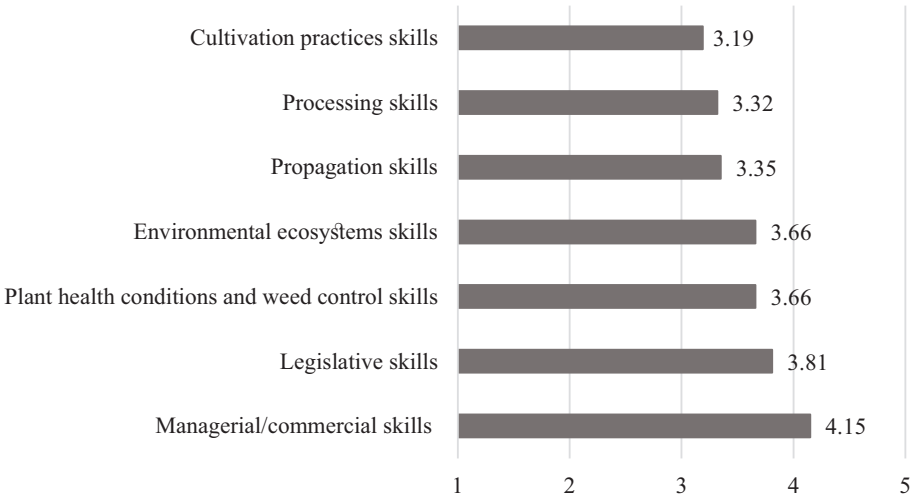

Figure 3: Future needs in herbs training (mean values, 1:not important, 5:extremely important).

A more in-depth analysis of future training needs for each skills category presented in Figure 3, is shown in Table 3.

Moreover, the most important training needs, with a mean value greater than 4, that need to be developed are marketing, trading, cooperating internationally, evaluating market demand, technological management, and innovation management (Table 4). All six major training needs of Greek responders are included in the broader category "Training for managerial/ commercial skills".

Regarding the efficiency of training methods, it was found that on-site and more active methods were noted as more efficient than passive ones which are more ancient media. In particular, the most efficient methods involved field demonstrations and practical courses, with mean values of 4.13 and 4.07 respectively while the less efficient was

Table 3: Future training needs for each skills category.

Training needs	Mean Value	St. deviation
a. Training for cultivation practices skills		
On planting process	3.20	1.30
An on-site selection like soil composition, pH level, drainage	3.40	1.28
On fertilizing	3.00	1.41
On irrigation	3.00	1.49
On relevant equipment and tools for cultivation and wildcrafting practices	3.37	1.33
b. Training for plant health conditions and weed control skills		
On identification of plant health problems	3.83	1.42
On weed control	3.47	1.33
On pest control	3.50	1.46
On disease control	3.83	1.34
c. Training for propagation skills		
On establishing and operating a herb nursery	3.23	1.33
On selection of propagation methods and materials (growing structures, cuttings, seed, separation, division)	3.30	1.37
On knowledge of each method's characteristics	3.53	1.36
d. Training for processing skills		
On harvesting	3.03	1.45
On storage/ post-harvest practices	3.13	1.50
On distillation techniques	3.57	1.48
On drying techniques	3.53	1.50
e. Training for legislative skills		
On understanding legislation for products, cultivation, propagations, taxes etc.	3.97	1.16
In dealing with bureaucracy	3.83	1.21
On regulations and fines about wildcrafting	3.40	1.40
On regulations about certifications	3.97	1.33
On organic certification	3.87	1.38
f. Training for environmental ecosystems skills		
Knowledge about the biodiversity conservation of endemic herb plant species	3.57	1.36
Knowledge about the ecology and sustainable management methods of herb species	3.60	1.19
New sustainable cultivation practices	3.97	1.30
New sustainable wildcrafting practices	3.50	1.53
g. Training for managerial/ commercial skills		
On business management	3.90	0.88
On innovation management	4.10	0.88
On technological management	4.13	1.07
On marketing	4.33	0.96
On trading	4.30	0.99
On evaluating market demand	4.13	1.01
On cooperating internationally (language, trade terminology)	4.17	1.09

Table 4: Most important training needs (mean values, 1:not important, 5:extremely important).

Training needs	Mean Value
On marketing	4.33
On trading	4.30
On cooperating internationally (language, trade terminology)	4.17
On evaluating market demand	4.13
On technological management	4.13
On innovation management	4.10

broadcasted on the radio and television, with mean values of 2.30 and 2.50 respectively (Table 5).

Table 5: The efficiency of training methods (1:not efficient, 5:extremely efficient).

Training methods	Mean Value	St. deviation
Field demonstrations	4.13	0.97
Short-term seminars	3.67	0.76
Practical courses	4.07	0.78
Online courses	3.53	1.31
Personalized education	3.80	1.03
On-line communication with an expert scientist	3.93	1.01
Creating newsgroups	3.50	1.31
Broadcasts on radio	2.30	1.09
Television broadcasts	2.50	1.28
Information material like brochures	2.87	1.43
Articles in newspapers	2.63	1.27
Scientific journals	3.10	1.56

The development of herb products trading requires improvements in the trade value of the products. All improvements in herb products' trade value seem to be very important, according to Table 6. More specifically, better value addition, reduction in the number of intermediaries, and better product presentation were rated very important, with 4.47 mean values for both of them.

In the SWOT type analysis that was performed, strengths/weaknesses and opportunities/threats were analyzed. According to the responders' answers and the demonstration of spider graphs (Figures 4 & 5), we conclude that there is a continuum of strengths/weaknesses. The analysis shows that if a variable is closer to 1, it reveals a weakness and if it is closer to 5, it reveals a strength. In that case, in the internal environment of a herb business, the strength is "product quality" with a mean value of 4.37 and the weakness is "mechanical harvesting" with a mean value of 3.37 (Figure 4).

Table 6: Improvement in the trade value of herb products (1:not important, 5:extremely important).

Trade value improvements	Mean Value	St. deviation
Certification documents	4.10	1.03
Ensure quality of the products, ISO	4.27	0.91
Better labelling (more details about the product)	4.10	0.80
Better product presentation	4.47	0.82
Controlled post-harvest handling	3.77	0.90
Undertake a more in-depth global review of the demand and supply of herb	4.33	0.84
Reduction in the number of intermediaries	4.47	0.86
Better value addition	4.47	0.86
Products traceability	4.23	0.97
Cheaper raw material	3.50	1.36
Modern and cost-effective machinery	4.20	1.00

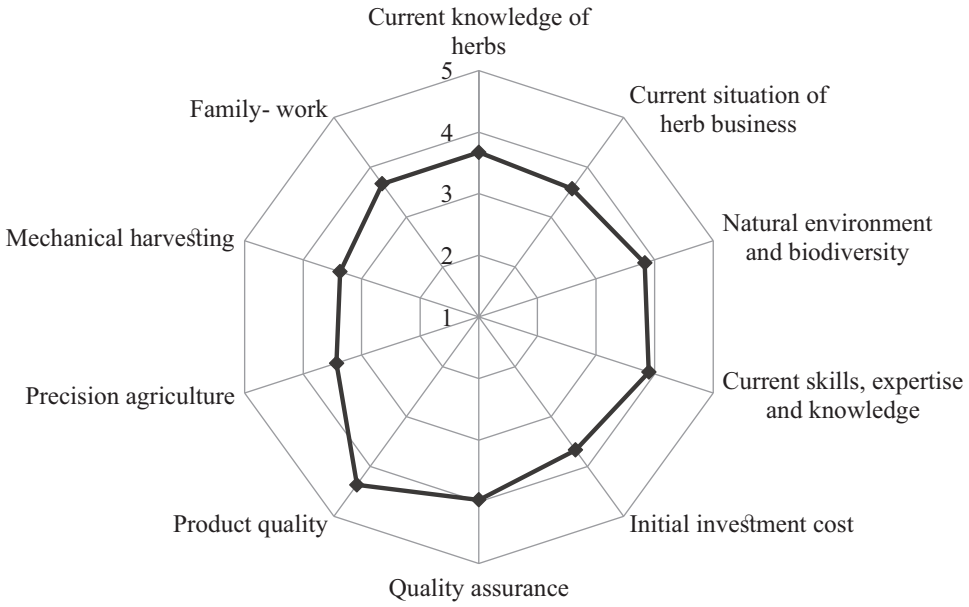

Figure 4: SWOT Analysis: Internal environment of a herb business (strengths/weaknesses, mean values)

The same applies to the continuum of opportunities/threats, if a variable is closer to 1, it reveals a threat and if it is closer to 5, it reveals an opportunity. In the external environment of a herb business, the opportunities are “trend of consumers” and “products with high nutraceutical value” with mean value 4. On the contrary, the threat is “farm size” with a mean value of 3.03 (Figure 5).

PEST analysis tool was used to analyze the Political, Economic, Socio-Cultural, and Technological changes in the business environment. According to the responders’ point of view, spider graphs present that the greatest impact on the political environment was the “legislation” (3.87 mean value) (Figure 6). In the economic environment, the greatest impact was the “production cost” (4.13 mean value) (Figure 7). In the social environment,

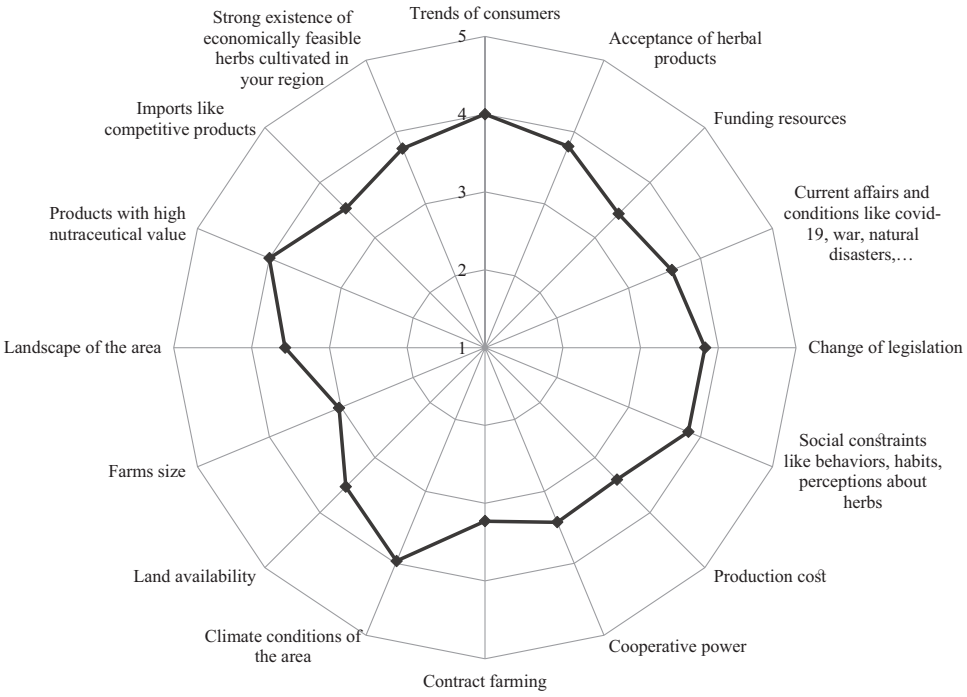

Figure 5: SWOT Analysis: External environment of a herb business (opportunities/threats, mean values).

the greatest impact was the “product quality” (4.27 mean value) (Figure 8), and finally in the technological environment the “innovations in herb businesses” (3.97 mean value) (Figure 9).

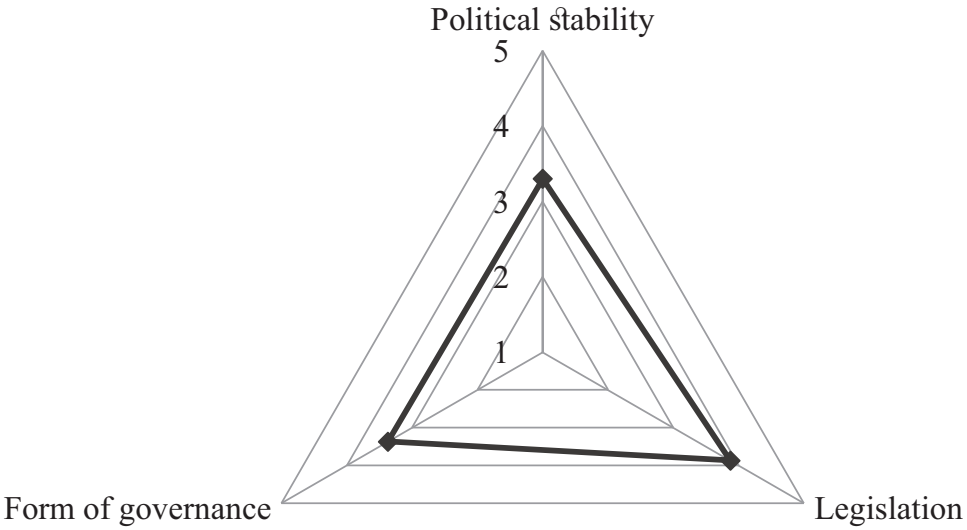

Figure 6: PEST Analysis: Political environment of a herb business (mean values)

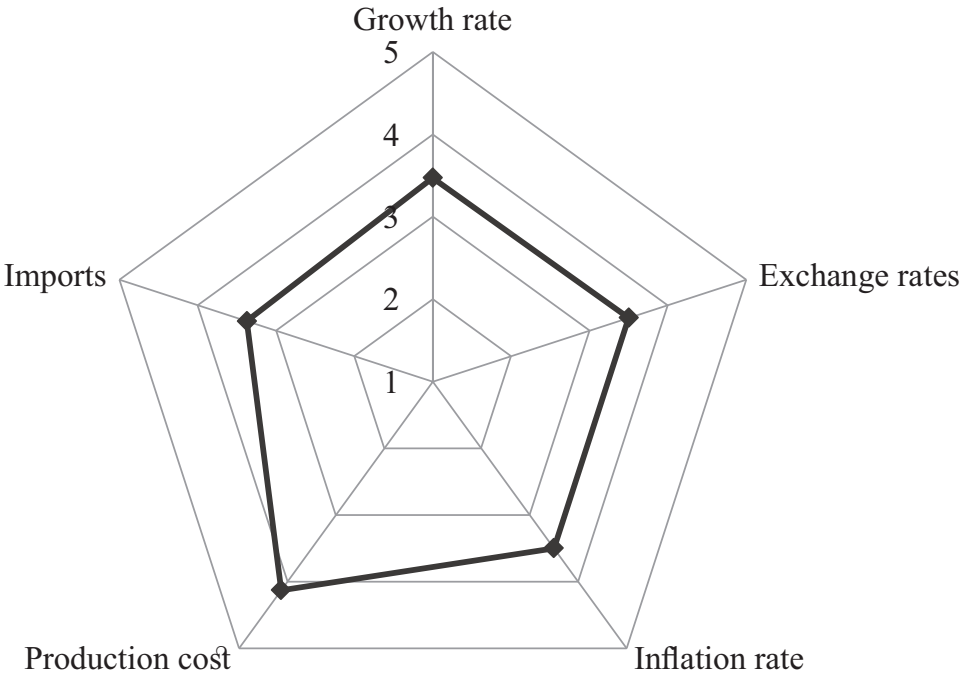

Figure 7: PEST Analysis: Economic environment of a herb business (mean values).

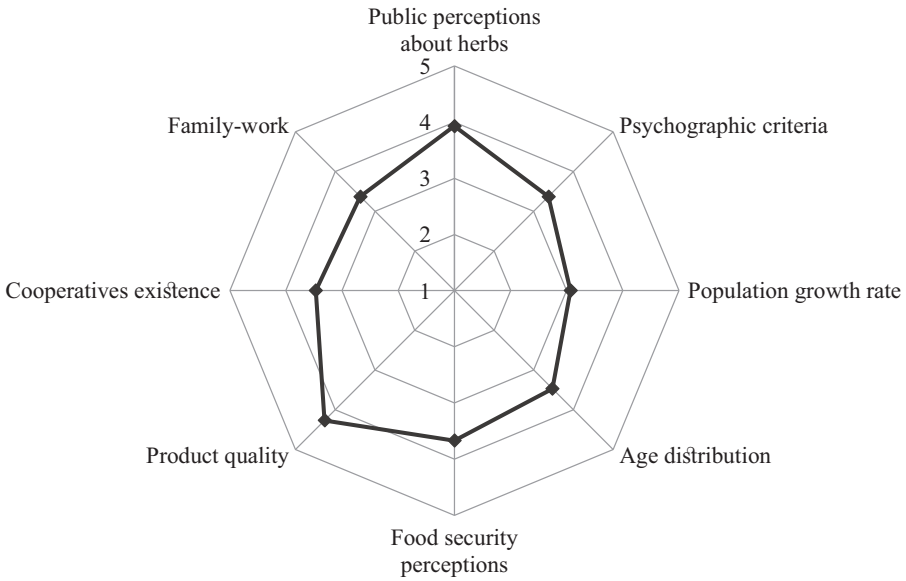

Figure 8: PEST Analysis: Social environment of a herb business (mean values).

4. CONCLUSIONS

This paper's contribution to the research field of herbs is really important, as it helps bring the sector of herbs a step closer to all different target groups that participated in the survey as well as reducing their training gap. The main results of this paper can be correlated with those of [9]. Results support that there is a lack of knowledge

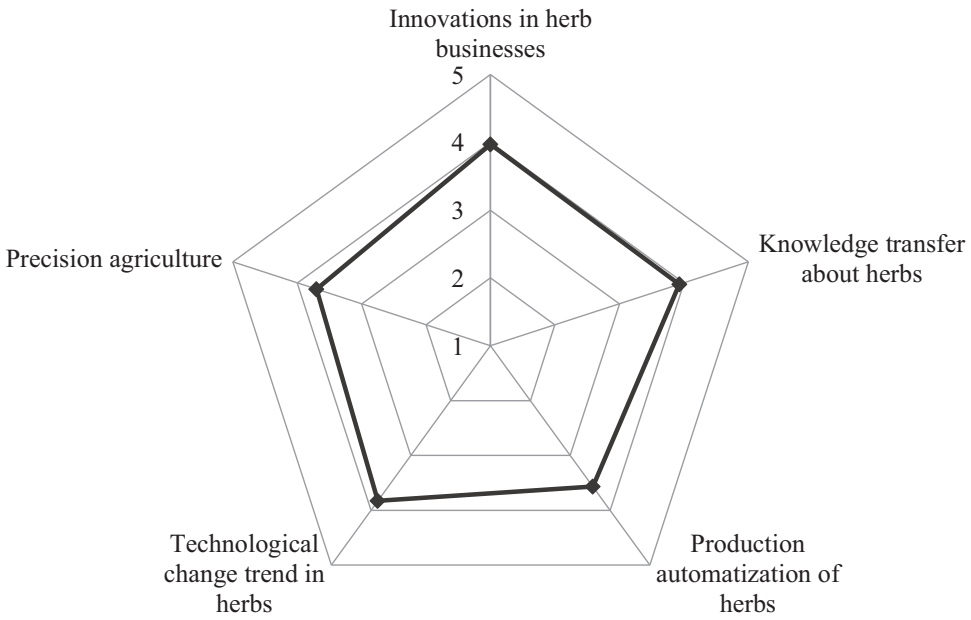

Figure 9: PEST Analysis: Technological environment of a herb business (mean values).

about herbs. The most important knowledge gap detected was in wildcrafting practices and trading, among survey participants. Moreover, there was an agreement that the cultivation of herbs requires more training and education. Future training should focus on gaining managerial/commercial skills. More specifically, the major future training needs are on marketing and trading. Field demonstrations and practical courses can bring the best results in training, according to participants' points of view. The development of herb businesses can be succeeded through the improvement of herb products' trade value like better product presentation, better value addition, and reduction in the number of intermediaries. It is also highlighted that the internal environment of a herb business is affected more by the product quality while the external environment is affected by both the "trend of consumers" and "products with high nutraceutical value".

Based on the results, we conclude with the following recommendations which can be the basis to design a common training programme in order to deal with potential threats in the herb sector:

1. Training on new sustainable cultivation practices.
2. Training on the identification of plant health problems and disease control.
3. Training on the characteristics of each propagation method.
4. Training on distillation and drying techniques.
5. Training on legislative skills, specifically on understanding legislation and regulations.

6. Training on managerial/ commercial skills, specifically in marketing and trading.

7. Training on improving the trade value of the products, like presentation, the value chain, and the value addition.

It seems that the field of herbs has to receive the attention of researchers. It is necessary to further intensify research in this direction, attempting a deeper content analysis. Training programs, innovations, and knowledge developments will contribute to the sustainability of agriculture in the future. The significant positive impact of the HEGO Project, as well as this study, will be the change of the production model for herb products in all Project countries, which will lead to a positive effect on improving the economic and business performance of the herb sector and indirectly on contributing to the biodiversity conservation of endemic herb plant species, with the sustainable utilization in Project countries.

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