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Olive Oil, Medicinal and Aromatic plants, and Tomatoes in North-West Tunisia: A Roadmap to Developing Competitive Advantage on Strategic Markets

Jade Salhab, Michael Weber, Tindaro Paganini, Faten Khamassi,
Siheem Bellagha, Housseem Bel Hadj, and Fatma Laabidi



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Jade Salhab, Michael Weber, Tindaro Paganini, Faten Khamassi, Sihem
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¹ For more information, see: “*Background report on the value chain and cluster development capacity building program*” authored by Henri Varlet and Sonia Sanchez Quintela under this activity.

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RELATED PUBLICATIONS:

1. Value Chain Development for Jobs in Lagging Regions: Let's Work Program in Tunisia: Overview of the approach, impact, and findings
2. Olive Oil in the North-West of Tunisia: Findings from a Value Chain and Jobs survey
3. Medicinal and Aromatic Plants in the North-West of Tunisia: Findings from a Value Chain and Jobs survey

Publications for the Value Chain Development for Jobs in Lagging Regions: Let's Work Program in Tunisia (P157321) package can be downloaded on [the World Bank Group Jobs and Development Publications Website](#).

Content

EXECUTIVE SUMMARY	9
1. CONTEXT AND OBJECTIVES OF WORLD BANK GROUP SUPPORT	14
1.1 INTRODUCTION.....	14
1.2 THE VALUE CHAIN DEVELOPMENT TRAINING PROGRAM	15
1.3 ACTIVITIES IN SUPPORT OF FUTURE WORLD BANK GROUP OPERATIONS	15
1.4 METHODOLOGY	16
2. HOW TO ENHANCE COMPETITIVENESS AND JOB CREATION FOR OLIVE OIL VALUE CHAINS IN THE NORTH WEST OF TUNISIA	18
2.1. MAIN FINDINGS	18
2.2 OLIVE OIL GLOBAL OVERVIEW AND SECTORAL TRENDS	19
2.3 NATIONAL OVERVIEW.....	27
2.4 CLUSTER ANALYSIS.....	31
2.5 STRATEGIC MARKET SEGMENTATION	34
2.6 OPPORTUNITIES IN THE GOURMET OLIVE OIL MARKET AND MISSING LINKS	37
2.7 WHAT IT WOULD TAKE TO SEIZE THIS OPPORTUNITY.....	39
3. HOW TO ENHANCE COMPETITIVENESS AND JOB CREATION FOR TOMATO VALUE CHAINS IN KAIROUAN AND SIDI BOUZID.....	43
3.1 MAIN FINDINGS	43
3.2 TOMATO GLOBAL OVERVIEW AND SECTORAL TRENDS	44
3.3 NATIONAL OVERVIEW.....	55
3.4 CLUSTER ANALYSIS.....	59
3.5 STRATEGIC MARKET SEGMENTATION	60
3.6 OPPORTUNITIES IN OFF-SEASON FRESH TOMATO FOR DEMANDING CONSUMERS	62
3.7 WHAT IT WOULD TAKE TO SEIZE THIS OPPORTUNITY.....	63
4. HOW TO ENHANCE COMPETITIVENESS AND JOB CREATION FOR VALUE CHAINS OF MEDICINAL AND AROMATIC PLANTS	66
4.1. MAIN FINDINGS	66
4.2 MEDICINAL AND AROMATIC PLANTS GLOBAL OVERVIEW AND SECTORAL TRENDS	66
4.3 THE CASE OF ROSEMARY IN TUNISIA	73
4.4 STRATEGIC MARKET SEGMENTATION	76
4.5 CONSTRAINTS ON ROSEMARY - AND MAPS AT LARGE	78
4.6 WHAT IT WOULD TAKE TO SEIZE THIS OPPORTUNITY.....	79
ANNEX A: FIVE FORCES METHODOLOGY USED FOR THE MARKET SEGMENTATION EXERCISE	82

ANNEX B: A VALUE CHAIN AND CLUSTER DEVELOPMENT TASKFORCE IN LAGGING REGIONS	83
ANNEX C: HYPOTHETICAL EXAMPLE OF POSSIBLE ENTERPRISE SUPPORT SERVICES FOR VALUE CHAIN UPGRADES IN TUNISIA	85
ANNEX D: LIST OF THE MOST IMPORTANT MEDICINAL AND AROMATIC PLANTS (MAPS).....	86
ANNEX E: MAPS IN TUNISIA.....	87
ANNEX F: TUNISIA EXPORT OF ESSENTIAL OIL, CONCRETE OR ABSOLUTE (QUANTITY: KG)	91
ANNEX G: A STRATEGY FOR MAPs.....	93
BIBLIOGRAPHY	95
FURTHER READING	98

Acronyms and abbreviations

Acronym	Definition
APIA	Agence de Promotion des Investissements Agricoles (Agricultural Investment Promotion Agency)
CAGR	compound annual growth rate
DCT	double concentrate tomato
FAO	Food and Agriculture Organization of the United Nations
GDA	Groupements de Développement Agricole (Agricultural Development Groups)
GDP	gross domestic product
GICA	Groupement des Industries de Conserves Alimentaires (Tunisian Canned Food Industries Group)
GIL	Groupement Interprofessionnel des Legumes (Interprofessional Grouping of Vegetables)
ILO	International Labour Organization
IOC	International Olive Council
ITC	International Trade Centre
ONH	Office National d'Huile (National Office of Oil)
PPD	public-private dialogue
PPP	plants or parts of plants
REF	Régie d'Exploitation Forestière (Forest Management Board)
SAE	Service d'Appui aux Entrepreneurs (Entrepreneur Support Services)
SWOT	strengths, weaknesses, opportunities, and threats
TVET	technical and vocation education and training
WAEMU	West African Economic and Monetary Union
WDI	World Development Indicators
WHO	World Health Organization
WPTC	World Processing Tomato Council

EXECUTIVE SUMMARY

Economic development in Tunisia has been characterized by significant regional imbalances, as coastal regions develop faster and interior regions lag. Together, Tunisia's North West (NW) and Center West (CW) regions are home to about 47 percent of the poor. Agriculture provides the bulk of employment and income opportunities in these two regions, and income levels remain low. Well-paying jobs and other income opportunities are limited, and overall economic prospects are threatened by unsustainable agricultural and natural resource management practices, as well as by climate change.

The World Bank Group (WBG) aims to support structural change in the Tunisian economy, particularly in the lagging regions. The approach capitalizes on the concept of value chain and cluster development to increase competitiveness as well as employment opportunities. The ultimate objective is to create more and better jobs in small and medium-size enterprises that are competitive in a diversified range of markets. Efforts are therefore not restricted to the largest players but aim to offer fair competition-based opportunities to local actors and smallholders.

This report is part of a technical assistance² (TA) delivered by the World Bank to identify some of the most binding constraints on job creation within targeted value chains and lagging regions. The analysis is based on the notion that in value chains, as a given product or service moves through the different stages of production, value is added and jobs are created. Market and institutional failures, however, can constrain the development of value chains as they reduce investments, preclude links, and thereby lessen the potential for job creation. The TA informs relevant World Bank lending projects to help tackle these constraints.³

A Value Chain Development Training Program, designed and delivered by a World Bank team, constituted a central element of the capacity building component of the TA. The objective was to build strategic capacities in value chain analysis within the Tunisian public administration, support private sector development, and focus on competitiveness and jobs in lagging regions. The training was offered to 25 civil servants and took place between April 2016 and November 2016. The value chains chosen for the training were mainly in agribusiness, but medical tourism was also covered to include a value chain in the services sector. The pilot lagging regions of focus, North West and Center West, were chosen in consultation with the government and in coordination with other World Bank projects.

Tutors complemented and deepened the analysis of the trainees in the cases of the value chains for olive oil, tomatoes, and rosemary. This report aims to summarize the main findings of trainees and their tutors, particularly on those three value chains. The objective was to (a) illustrate the kind of expected outputs from this approach and (b) inform the design of potential World Bank lending operations through the use of a value chain and cluster development approach to accelerate job creation – especially for low-skilled youth – and reduce inequalities between the leading and the lagging regions of Tunisia.

² Value Chain Development for Jobs in Lagging Regions—Let's Work Program in Tunisia

³ The TA is part of the Let's Work program coordinated by the World Bank Group for more and better private sector jobs in countries like Tunisia, Bangladesh, and Mozambique. Let's Work is a global partnership that unites organizations to provide effective solutions to the global job crisis by harnessing the potential of the private sector to help create more and better jobs, in a vision that seeks fairness and inclusiveness (see <https://www.jobsanddevelopment.org/lets-work/>).

OLIVE OIL

Tunisia occupies a prominent place on the olive oil market as it holds 4.4 percent of world production. In 2017 Tunisia ranked as the 6th largest producer of olive oil (100,0 metric tons). Cultivation of olive trees provides income to more than 309,000 farmers, who represent 65 percent of all farmers in Tunisia. More than 70 percent of the production is of extra virgin quality, and 40 percent of olive-growing areas are organic. Tunisia exports 75 percent of its olive oil production. Main destinations are the European Union, which took around 70 percent of the exported olive oil, and North America (16 percent).

The North West region represents 41 percent of Tunisia's production of organic, virgin, and extra virgin olive oil, with an average volume of 90,000 metric tons per year. Compared with Central and South Tunisia, the North West records the highest yields, given its high rainfall, higher planting density, and young age of olive trees.

The strategic market segmentation exercise completed by trainees and tutors identified gourmet olive oil as the segment with the highest “attractiveness” for farmers in the North West. Porter's 'Five Forces' analytical tool (see Annex A) was used to assess industry attractiveness and identifying the actors within the industry with the most bargaining power. In particular, gourmet olive oil segment is associated with the concept of the highest organic olive oil quality, on sale in specialty shops and luxury restaurants. The product is a highly differentiated, with strong value added, few surrogates, and entry barriers that are high because of the product differentiation. The global trend in consumption of gourmet olive oil is mainly motivated by the need for a healthy diet, as well as the value of a specific flavor and taste. Consumers and buyers of this product are more demanding than for the other olive oils. The high differentiation of the product ensures producers a strong bargaining power and, consequently, a higher margin, awarding high attractiveness to the segment.

To promote success of local producers in this attractive segment, three broad categories of strategic interventions were identified:

Production. Gourmet olive oil requires sophisticated controls in terms of cultivation and technology. Actors in the chain need to be informed and educated about how to improve production, align it to international standards, and reinforce the capacity of the workforce, rural women in particular.

Post-harvest. The olive oil transformation process needs to comply with the highest requirements in terms of hygiene and quality. These standards have to be met from the transport of the olives to the conditioning of the oil, so that the olive oil retains its properties without any alteration. Quality standards should be controlled by a specialized institution at every stage of the process.

Marketing. The product is brought on the international market in a volume and in packaging that meet the demands of consumers, through ad hoc marketing, aimed at increasing visibility.

Trainees proposed an action plan for the development of the gourmet olive oil value chain structured around seven axes: (a) improve the legal and institutional framework to enhance market access; (b) implement a market development strategy for gourmet (high-end) products based on knowledge of customers' preferences in high-value markets and on the creation of a brand image for olive oil of Tunisian origin; (c) improve logistics of the value chain—from the harvest to oil mills—to ensure the quality of the oil; (d) develop agricultural production technologies and improve olive yields per hectare; (e) develop export promotion by optimizing the various existing export supports and strengthening the coordination between support organizations; vi) introducing financial products accessible to the various actors; vii) improving applied economic research.

The most critical of these actions were considered business strategy advice, coaching and access to common services (quality control, packaging, gourmet marketing...) that today are not even available

in Tunisia, and even less in the Northwest. And more important the need to rally farmer-entrepreneurs to go for that new segment and work together to achieve the economies of scale necessary to access those common services and engage in a productive sector specific public private dialogue.

TOMATOES

Tunisia holds 0,7 per cent of tomatoes world production. In 2017, the country was the 16th largest producer of tomatoes in the world (with 1,28 million metric tons of production) and second in the Middle East and North Africa region, after the Arab Republic of Egypt (7,29 million metric tons). Tunisia uses 75 percent of its production for processed tomato—double concentrate tomato (DCT)—in comparison with the 30 percent worldwide, and 35 percent in Morocco. As diets in developed countries become increasingly oriented toward fresh and natural products, the consumption and trade of fresh tomatoes—as opposed to processed tomato products—is becoming increasingly predominant.

A market-oriented shift might be necessary to sustain the competitiveness of the Tunisian tomato industry. Exports of Tunisian DCT have fallen during the past decade (60 percent), and more drastically since 2010 (75 percent). Exports of DCT from Tunisia amounted to 12,853 metric tons in 2016. Traditionally targeted markets (Algeria and Libya) have reduced their imports from Tunisia, and DCT prices on the international market have been declining because of the entry of China and India as major producers. Despite this trend, there is little evidence of a policy shift to consider alternatives. Although exports of fresh tomato increased from 2,481 metric tons in 2001 to 13,500 metric tons in 2016, they still represent less than 2 percent of total tomato production. Most exporters are locally established and vertically integrated foreign firms. Similarly, less than 7 percent of tomato production is processed into dried tomatoes.

In their diagnostics exercise, trainees focused on Kairouan and Sidi Bouzid and revealed that those two governorates account for almost 30 percent of Tunisian tomato production. An area of 4,500 hectares is devoted to seasonal tomatoes, with yields well above the Tunisian average: between 70 and 75 metric tons per hectare result in 190,000 metric tons per year. However, cultivation areas have begun to decrease because of the decline in DCT production and exports.

To explore a better alignment between global market trends and local production, trainees and their tutors conducted a segmentation exercise and concluded that the most attractive segment for the Sidi Bouzid/Kairouan cluster is fresh tomato for demanding consumers. In this market segment, largely concentrated in Western Europe but also covering Russia, consumers and buyers are more demanding in terms of quality, freshness, and flavor of the fruits. A differentiated and more complex production process requires more selection and upstream research, quality control, and very efficient logistics. It seems to be the most attractive segment because producers that are able to meet the demand for quality and freshness (maximum delay of 72 hours to market) have more price margin and bargaining power. In addition, there are high entry barriers with few substitutes and competition is lower than in the previous segments. Finally, the segment is growing because consumers increasingly demand healthy products with high nutritional value and abundance of antioxidants.

To succeed in this international market, fresh tomatoes must meet precise and very different consumption needs: tasty and authentic varieties, freshness, color, shape and gauge, homogeneity and symmetry, robustness of the skin, flexible and differentiated packaging that communicates freshness and superior quality, traceability of packaging units, and refrigerated transport after harvest.

To help Tunisian producers meet such standards, participants highlighted the critical need to stimulate investments to develop the supply (and particularly the cold) chain. This effort translates into investments not only in the agricultural sector, but also in the services sector. The scheme also has potential positive externalities on the region's entire production of fruits and vegetables. Trainees

proposed a series of strategic actions that relate to different stages of the value chain: production, workforce skills, transport, post-harvest activities, distribution, sales, and promotion.

The exercise concluded with the recommendation that an initiative to develop value chains that lead to higher added-value markets should be structured around the following actions: i) Improve the supply logistics system; ii) Develop tomato production technologies; iii) Put in place a strategy to promote and connect the fruit and vegetable distribution platforms in Europe (tomato could be a linchpin to the larger fresh fruit and vegetable market); iv) Create a research program on tomato varieties and capacity building for farmers, technicians, and engineers; v) Provide incentives for investments in packaging; vi) Offer incentives to invest in off-season tomato production.

MEDICINAL PLANTS—ROSEMARY

Medicinal and aromatic plants (MAPs) are botanical raw materials primarily used for therapeutic, aromatic, and culinary purposes as components of cosmetics, medicinal products, health foods, and other natural health products—and the world market for them seems to be growing. Although detailed data are lacking,⁴ available information indicates that the world market for MAPs continues to grow. An estimated 50,000–70,000 medicinal and aromatic species are harvested from the wild. The total of MAPs in international trade has been estimated around 2,500 species. Moreover, the annual global export value of pharmaceutical plants alone was over US\$3.1 billion in 2016, with an increase of 18.5 percent in the period from 2012 to 2016.⁵ Consumers increasingly demand organic, natural, ethnic, and traditional products, and those obtained through fair trade.

Tunisia has a high diversity of plants because of its varied topography, climate, and edaphic conditions; its flora includes more than 2,000 species, which grow in various bioclimatic zones. Most Tunisian MAPs grow in rain-fed conditions and are highly dependent on environmental factors. About 800,000 hectares of forestland in the north and 4.700 million hectares of rangeland in southern Tunisia are suitable for spontaneous production. Almost 80 percent of forest cover is rosemary and myrtle. Planted varieties are estimated at 20 kinds of plants and occupy an area of almost 1,400 hectares. MAPs contribute 0.8 percent to the value of agricultural production and 1.0 percent to agricultural exports.

Training participants determined that a shift from an industry that supplies simple commodities to one that supplies higher value-added product lines is needed to address the strong pressure exerted on the existing aquifers of rosemary, and the strong demand of the international markets. The strategic market segmentation conducted by the trainees indicated that the segments in which Tunisian products would have the most competitive advantage are (a) fresh rosemary for gastronomy, (b) fresh rosemary as a functional food and natural health product, and (c) the natural extract of rosemary as a functional food and natural health product.

Major constraints identified for the development of value chains linked to the most attractive segments are (a) a lack of access to natural resources, (b) a lack of development of cultural practices and processing methods, (c) a national regulatory framework that does not follow international standards, (d) a lack of working capital for small and medium enterprises to enter the sector, (e) failure

⁴ It is a key challenge to measure the size of the sector: there are multiple classifications whereby the same plant can be considered both an aromatic and medicinal species, as is the case of thyme and rosemary. The inconsistency arises because there is no comprehensive and exhaustive list of harmonized tariff codes for MAPs. Many countries struggle with the lack of specificity of their tariff schedules and look to add more specific 8- and 10- digit codes for their most important botanical imports and exports.

⁵ International Trade Centre, Trade Map dataset, <http://www.trademap.org/stDataSources.aspx>.

of logistics for cold storage and transport, (f) a lack of marketing and market visibility, and (g) the absence of coordination among the main players.

The combination of spontaneous and cultivated rosemary with an increase in certified organic areas seems the best way to sustainably achieve the objectives of the new strategic direction. An increase of rosemary cultivations should enable Tunisia to meet international demand and facilitate certification, while it also alleviates pressure on naturally harvested rosemary.

The analysis led to an action plan structured around six strategic areas: (a) reform of the forests code, (b) better access to strategic markets, (c) transformation and innovation, (d) domestication of spontaneous MAPs and planting of cultivated MAPs, (e) coordination of producers and collaboration with industries, and (f) improved access to financing,

1. CONTEXT AND OBJECTIVES OF WORLD BANK GROUP SUPPORT

1.1 INTRODUCTION

Economic development in Tunisia has been characterized by significant regional imbalances, as coastal regions develop faster and interior regions lag. North West (NW) and Center West (CW) regions together are home to about 47 percent of the poor. They have the lowest regional development indicators in education, employment, and health and the highest unemployment rates for university graduates.

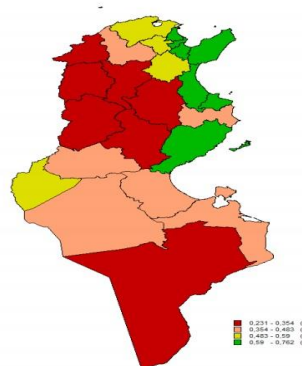
Agriculture (crops, forestry, and livestock) dominates the economy in the NW and CW regions. The two regions account for 50 percent of Tunisia's agricultural land and 82 percent of forests. Agriculture provides the bulk of employment and income opportunities in these two regions and income levels remain low. Well-paying jobs and other income opportunities are limited, poverty levels are high, and overall economic prospects are threatened by unsustainable agricultural and natural resource management practices, as well as by climate change. Recent analytical work and field engagement by World Bank teams during project preparations point to four broad constraints that hamper access to higher value-added markets and, more generally, the sustainable development of Tunisia's North West and Center West regions:

- Limited availability of key common services necessary for the development of competitive businesses, such as advanced logistics, business intelligence services, research and development, and financial services
- National policies that fail to foster the sustainable development of agriculture and competitive agribusiness activities
- Fragmented institutional support and centralized administrative approaches to local development that result in a lack of effectiveness and efficiency
- Limited infrastructure and public services (including transportation, education, health, water supply, and sanitation)

The World Bank Group (WBG) approach aims to promote structural change in the Tunisian economy, particularly in the lagging regions. The approach capitalizes on the concept of value chain and cluster development to determine how to improve market access and increase productivity, employment, and competitiveness. The ultimate objective is to create more and better jobs in small and medium enterprises (SMEs) that are competitive in a diversified range of markets. Efforts are therefore not restricted to the largest players but aim to offer fair competition-based opportunities to local actors and smallholders.

Creating more and better jobs for all citizens—women and men—is essential for sustainable and resilient growth across the world. Moreover, it is intrinsic to the WBG's twin goals: reducing poverty

2015 Regional Development Index Map



Source: African Development Bank -Tunisia
Country Strategy Paper 2017-2021

and promoting shared prosperity. The approach would help (a) orient public investments to maximize the effect on the business environment and job creation in disadvantaged regions; (b) maximize synergies through private-private and public-private dialogues that are based on market-oriented analytics; and (c) improve coordination and build capacity among existing institutions that support micro, small, and medium enterprises (MSMEs) through an integrated value chain development offering, and thus allow the approach to be replicated with other value chains and clusters and in other regions of Tunisia.

1.2 THE VALUE CHAIN DEVELOPMENT TRAINING PROGRAM

The objective of this technical assistance (TA) project, the “Value Chain Development for Jobs in Lagging Regions—Let’s Work Program in Tunisia,” is to identify some of the most binding constraints that hamper the creation and productivity of jobs within targeted value chains in lagging regions of Tunisia and to inform relevant World Bank lending projects currently in preparation to help tackle these constraints.⁶

The Value Chain Development Training Program, designed and delivered by a World Bank team, is a central element of the capacity building component of the TA. The objective was to build strategic capacities in value chain analysis within the Tunisian public administration to help them support private sector development for jobs creation and competitiveness, with a focus on lagging regions.

The training was offered to 25 civil servants grouped in seven teams and took place between April and November 2016. It comprised five in-class training weeks (five learning modules) in addition to a hands-on exercise for the participants to work on over the training period. Civil servants were nominated to be trainees by participating government institutions. The analysis enabled the trainees to learn about the business relationships that connect a value chain, methods to raise efficiency along the chain, and ways for firms to expand their businesses. The training started with a strong focus on market segments that have a potential to foster more jobs and to provide a high return on investment to firms.

The hands-on training helped the participants identify recommendations that could reinforce the competitiveness of companies in a given local economic cluster. This six-month exercise proposed recommendations on how to develop several pilot clusters and value chains. It combined (a) the application of standard change management tools as used in business consulting as well as group psychology with (b) an approach involving 10-distinct steps to identify what has to be modified to make the studied value chain more competitive and create better jobs. The following analyses and recommendations are based on the findings of the exercises.

1.3 ACTIVITIES IN SUPPORT OF FUTURE WORLD BANK GROUP OPERATIONS

⁶ The TA is part of the Let’s Work program coordinated by the World Bank Group for more and better private sector jobs in countries like Bangladesh, Mozambique, and Tunisia. Let’s Work is a global partnership that unites organizations dedicated in the effort to provide effective solutions to the global job crisis by harnessing the potential of the private sector to help create more and better jobs, in a vision that seeks fairness and inclusiveness (see <https://www.jobsanddevelopment.org/lets-work/>).

The value chains chosen for the analysis due to their readiness and relevance for follow up operational engagements, potentially strong and positive effects on targeted social groups, and their complementarity to other World Bank activities. Identified in consultation with the Government of Tunisia and linked to WBG-financed operations under preparation or implementation, the selected value chains were mainly in agribusiness. Only medical tourism was additionally included to represent a value chain in the services sector. The pilot lagging regions of focus, North West and Center West, were also chosen in consultation with the government and in coordination with other World Bank projects and ongoing WBG technical assistance. The regions are among the poorest in the country with some of the lowest regional development indicators and the highest unemployment rate. (According to INS⁷, almost 20 percent unemployment for the regions and 26 percent for the governorate of Kasserine in 2011). In both regions, the most affected demographic groups are young men and women. Even though the proportion of the population that works in agriculture is steadily declining, the sector remains an important provider of jobs, particularly in rural regions (18 percent of the workforce in 2011).

The seven clusters analyzed by participants were the following:

Project #	Location	Industry
Project 1	Grand Tunis	Medical tourism
Project 2	North West (governorates of Jendouba, Béja, Siliana, and Kef)	Olive oil
Project 3	Center West (governorates of Sidi-Bouzyd and Kairouan)	Chili peppers
Project 4	Center West (governorates of Sidi-Bouzyd and Kairouan)	Tomatoes
Project 5	North West (governorates of Jendouba, Béja, Siliana, and Kef)	Myrtle
Project 6	North West (governorates of Jendouba, Béja, Siliana, and Kef)	Lentisk (mastic)
Project 7	Center West (governorates of Kasserine, Gafsa, Sidi Bouzid, and Kairouan)	Alfa (esparto grass)

In the case of three of these value chains (olive oil, tomatoes, and rosemary), the training program’s tutors worked with product experts⁸ to complete and deepen the studies made during the training. This complementary work was introduced to (a) showcase the expected outputs stemming from analysis and (b) inform the design of potential World Bank lending operations using a value chain and cluster development approach to accelerate job creation (especially for low-skilled youth) and reduce inequalities between the leading and lagging regions of Tunisia. This report summarizes the outcomes of these three analyses.

1.4 METHODOLOGY

The analysis of the three value chains started with a background and contextual industry deep dive of the global industry⁹. The research focused on industry dynamics and trends related to the:

⁷ Tunisian National Institute of Statistics.

⁸ In this report, the whole training program’s tutors and product experts will be referred as “the team”.

⁹ This methodology is based on the approach adopted by the World Bank Group Reports on “Global Strategic Segmentation Analysis” on Horticulture Industry, Beef industry, Footwear industry, and Medicinal and Aromatic Plants (2017)

- global supply (including historical reasons for success in certain countries and regions; and ways in which markets are responding to changes in demand),
- evolution in demand (geography and product/service),
- industry cost structure and margins,
- recent evolution in value chain structure (e.g. localization, specialization and integration amongst firms).

The global industry was then “segmented” not only by product but also by the intended market (or user group) for that product. This industry “strategic market segmentation” was based on structural trends and insights gleaned from the global industry deep dive alongside Prof. Michael Porter’s ‘Five Forces’ analytical tool (see Annex A). Porter’s ‘Five Forces’ analytical tool was used to assess industry attractiveness by determining the profitability of the industry and identifying the actors within the industry with the most bargaining power (thereby determining which actors appropriate the bulk of the available profits). For each segment, an analysis of the margins was made (through Porter’s five forces model). A collection of data on the strengths for each segment leads to the identification of the most “attractive” market segments for the target beneficiary of the exercise (reference point).

The analysis considered farmers (as opposed to retailers) as the reference point when assessing the relative strength of Porter’s five forces, since World Bank Group financed projects aim to promote income growth of the bottom 40 percent of the population.

For each strategic segment in each value chain, the proposal of activities involved:

- An ‘Advanced Buyer Purchase Criteria’, to identify the minimum requirements (e.g. quality, volume standards, number of pairs, price, safety standards, transparency, traceability, financial viability) that commercial buyers (both B2B and consumers)¹⁰ would accept.
- An assessment of geographic strategic options, to identify the advantages and disadvantages of targeting a local / global market using a single product offering or regionally-adjust product/brand strategies.
- An evaluation of product and branding strategies, to understand the difference between niche market and global market strategies.
- An identification and qualification of Key Success Factors, to determine the characteristics a firm needs in order to compete successfully.
- A mapping of the ‘ideal’ value chain using the above steps (i), (ii) and (iii) for each strategic segment and identify;
 - the relative “concentration” of each of the activities in the value chain
 - the relative knowledge, capital, labor as well as energy intensity of each value chain and its reliance on natural resources or factor conditions
 - the nature of the “linkage” between each value chain activity in terms of frequency of the exchange of goods, services and information; and also in terms of the speed of delivery of goods, services and information.

¹⁰ Both “business to business” and “business to consumer” customers.

2. HOW TO ENHANCE COMPETITIVENESS AND JOB CREATION FOR OLIVE OIL VALUE CHAINS IN THE NORTH WEST OF TUNISIA

2.1. MAIN FINDINGS

World consumption of olive oil is on the rise: it increased 1.8-fold in volume between 1990 and 2015. Tunisia occupies a prominent place on the olive oil market as, in 2017, held 3,9 percent of world production. In 2017 Tunisia ranked as the 7th largest producer of olive oil (100,0 metric tons).¹¹ Tunisia's olive oil exports accounted for 5.5 percent of world's total exports, placing Tunisia fifth in the world.¹² The North-West region of Tunisia has an average production of 90,000 metric tons per year (41 percent of national production) of organic, virgin, and extra virgin olive oil (Ministry of Agriculture, Water Resources, and Fisheries 2013). The strategic market segmentation for the olive oil value chain identified gourmet olive oil as the segment with the highest “attractiveness.” The segment is associated with the concept of the largest organic olive oil quality and retail focuses on specialty shops and servings in luxury restaurants.¹³ The product is a highly differentiated, with strong value added, few surrogates, and high entry barriers because of the product differentiation. The global trend in consumption of gourmet olive oil is mainly motivated by the need for a healthy diet, as well as the value of a specific flavor and taste. Consumers and buyers of this product are more demanding than for the other olive oils. The high differentiation of the product ensures producers a strong bargaining power and, consequently, a higher margin, awarding high attractiveness to the segment.

Market analysis shows a strong potential for adding value in the gourmet products market through a strategy of differentiation based on product and promotion. As per the analytical findings, the development of the olive oil value chain should be structured around seven strategic axes:

- Improve the legal and institutional framework to enhance market access.
- Implement a market development strategy for gourmet products based on knowledge of customers' preferences and the creation of a brand image.
- Improve the logistics of the value chain, from harvest to oil mills, to ensure the quality of the oil.
- Develop agricultural production technologies and improve olive yields per hectare.
- Improve promotions of the export through optimization of existing export support and better coordination among organizations.
- Introduce more accessible financial products.

¹¹ International Olive Council (IOC), www.internationaloliveoil.org/

¹² International Trade Centre, Trade Map website, www.trademap.org/

¹³ According to the IOC, extra virgin olive oil is the highest quality of olive oil. It is obtained only from the olive, through solely mechanical or other physical means and in conditions—particularly thermal conditions—that do not alter the oil in any way. Extra virgin olive oil has a free acidity, expressed as oleic acid, of no more than 0.8 grams per 100 grams (0.8 percent) and other characteristics that correspond to those fixed for this category in the IOC standards. Organic olive oil meets the same requirements of extra virgin olive oil, but it is made using only certified organic olives. Organic olive oil is only one sign of quality among others, and if it is not accompanied by a strategy of differentiation (high-quality packaging and descriptions of the characteristics specific to the variety of olives and its mode of crushing and history) and its promotion through deli distribution (*épicerie fine*) it cannot be in the gourmet segment, which includes the highest quality of extra virgin olive oil that is highly differentiated and on sale only in specialty shops and luxury restaurants.

- Improve applied economic research.

2.2 OLIVE OIL GLOBAL OVERVIEW AND SECTORAL TRENDS

Olive oil is the main component of the Mediterranean diet, and it has gained popularity in food and beverages because of its many proven health benefits and its culinary usefulness. With Spain, the largest producer and exporter, and Italy, the largest importer, the Mediterranean basin is considered the worldwide hub of olive oil production and related businesses.

At first glance, olive oil might seem of limited importance when viewed in terms of world statistics; it represents only 3 percent of the world market of edible vegetable oils.¹⁴ In terms of product value, however, olive oils have a distinctly larger (15 percent) share of world trade because its unit market values are significantly higher than those of alternative oils (Aparicio and Harwood 2000).

The olive oil sector makes a notable contribution to the economic activity of several countries. In Spain, for instance, over half a million farmers are involved in olive growing, and the sector annually requires 46 million working days. In Tunisia, more than one-tenth of the population earns all or part of its income from olive farming. The sector provides around 30 percent of seasonal employment in agriculture, in addition to permanent jobs (Aparicio and Harwood 2000).

Global Production and Consumption

World production of olive oil was 2,56 million metric tons in 2017. Nearly all—98 percent—of world production is concentrated in the Mediterranean basin. Spain (50.3 percent), Greece (7.6 percent) and Italy (7.1 percent) are the main olive oil producers.¹⁵ Tunisia, with 3.9 percent of world production, ranked seventh. The total area of olive groves is over 11 million hectares in 47 countries. More than 6,700,000 families worldwide have olive trees, 1.67 hectare per family on average.¹⁶

¹⁴ In 2015–16 total production of vegetable oils worldwide amounted to about 185.78 million tons. Palm oil, soybean oil, rapeseed oil, and sunflower oil accounted for around 87 percent of the production (U.S. Department of Agriculture), <https://www.usda.gov/>

¹⁵ The IOC is the world's only international intergovernmental organization in the field of olive oil and table olives. Its current membership members includes the leading international producers and exporters of olive oil and table olives. IOC producer members account for 98 percent of world olive production, located primarily in the Mediterranean region. See the IOC website, <http://www.internationaloliveoil.org>.

¹⁶ IOC website, www.internationaloliveoil.org/

Table 1**Key figures on the world market for olive oils****(Data adopted at the 108th session of the IOC, Madrid, November 19-23, 2018)**

2016/17 crop year - Final balance - (1 October 2016 - 30 September 2017)				
	Production	Imports	Consumption	Exports
	-----	-----	-----	-----
Albania	11.5	1.5	13.0	0.0
Algeria	63.0	0.0	67.0	0.0
Argentina	24.0	0.0	7.5	16.5
Australia	21.0	29.0	45.0	4.5
Brazil	0.0	59.5	59.5	0.0
Canada	0.0	39.5	39.5	0.0
Chile	20.0	1.0	6.0	13.0
China	5.0	39.0	44.0	0.0
E. U./28	1,752.0 a)	90.5 b)	1,402.0	558.0 b)
Egypt	30.0	0.0	22.0	6.5
U.S.A.	15.0	305.0	315.0	8.0
Iran	3.5	2.5	8.0	0.0
Israel	18.0	3.0	21.0	0.0
Japan	0.0	54.5	54.5	0.0
Jordan	20.0	0.0	19.0	0.5
Lebanon	25.0	3.5	20.0	8.0
Libya	16.0	0.0	16.5	0.0
Morocco	110.0	7.0	120.0	9.0
Mexico	0.0	14.0	14.0	0.0
Palestine	20.0	0.0	15.0	6.5
Rusia	0.0	19.5	19.5	0.0
Syria	110.0	0.0	98.0	12.0
Tunisia	100.0	0.0	21.0	89.5
Turkey	178.0	0.0	150.0	45.0
Other countries	19.5	112.5	129.0	5.5
TOTAL	2,561.5	781.5	2,726.0	782.5

Source: IOC 2019

Note: 0 Nil or under 300 tons

- a) Of which: Cyprus (6.0), Croatia (5.0), France (3.3), Greece (195.0), Italy (182.3), Portugal (69.4), Slovenia (0.4), Spain (1,290.6).
- b) Extra Community Trade Only, including inward processing traffic

Table 2**Main olive oil producing countries, 2016–17**

Country	Production (metric tons, thousands)	Percentage of world total	Percentage change from 2006
Spain	1,290,6	50,3	+56,2
Greece	195,0	7,6	-54,0
Italy	182,3	7,1	-71,3
Turkey	178,0	6,9	+58,9
Morocco	110,0	4,2	+46,7
Syrian Arab Republic	110,0	4,2	+10,0
Tunisia	100,0	3,9	-120,0
Portugal	69,4	2,6	+138,5
Algeria	63,0	2,4	+96,9

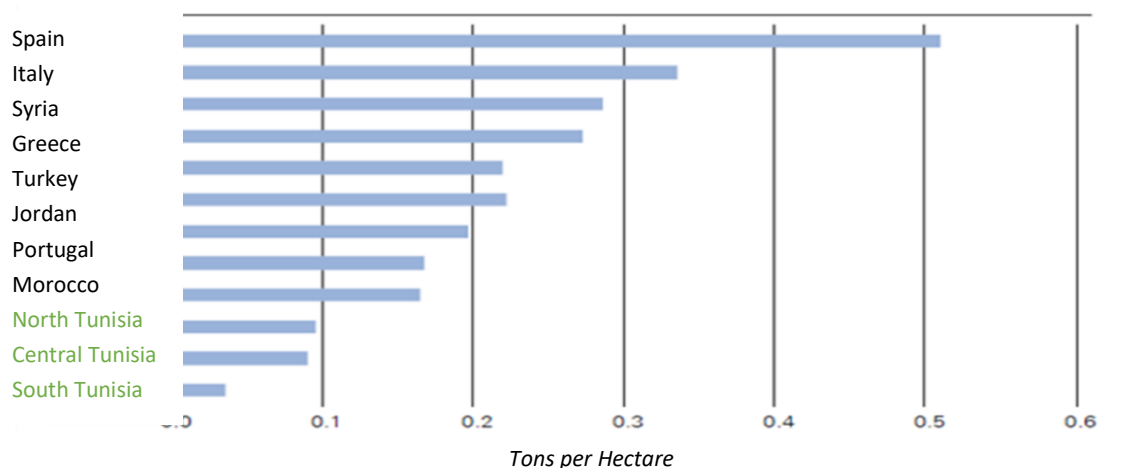
Source : IOC website, 2019

In addition to the traditional olive-producing Mediterranean basin, the cultivation of the olive tree is spreading to other countries, such as the United States and Afghanistan, India, Pakistan, and other Asian countries. Argentina and Chile already produce almost 25,000 metric tons per year (FAO 2015), and much larger production areas are being developed, often through foreign investment from leading traditional countries such as Spain and Italy. It can be expected that, as happened with wine, new producer countries will increase quality and productivity and will become, in the long term, competitors of the Mediterranean area.

Over the past 20 years, the annual average global production of olive oil fluctuated between 2.5 and 3.2 million metric tons. Climatic hazards (drought), the alternation of varieties, and diseases are the main reasons for these variations. For example, the epidemic that ravaged olive harvests in Spain and Italy in 2014–15 led to a drop in world production, which reached 2.444 million metric tons during the season. Tunisia was able to achieve an unprecedented harvest of 340,000 metric tons for the same season, eight times more than the previous season and 54 percent more than in 2012–13 (IOC 2015).

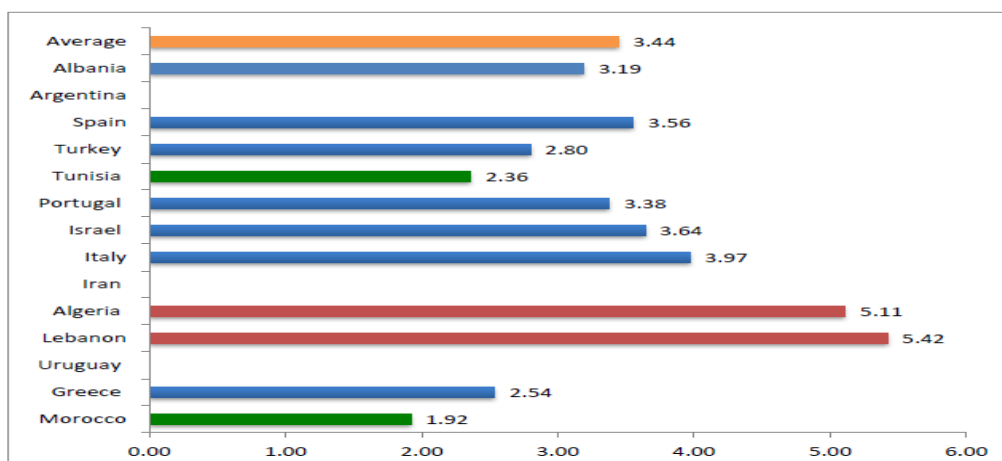
Olive oil's production costs depend on several factors, but the most significant is the production system and technology, which differ from one country to another. Olive yields in Tunisia are among the lowest (Figure 1). Despite that, Tunisia has one of the lowest production costs (€2.36 per kilogram), as far as traditional cultivation systems are concerned, not because of high yields, but because of low investment in production systems and the low cost of labor compared with Europe (Figure 2).

Figure 1
International benchmarking of olive yields, tons per hectar



Source: LMC International, DGPA, 2010-2012

Figure 2
Cost of obtaining one kilogram of olive oil in traditional olive cultivation systems without irrigation (euros).
Plantation density <180 trees per hectar



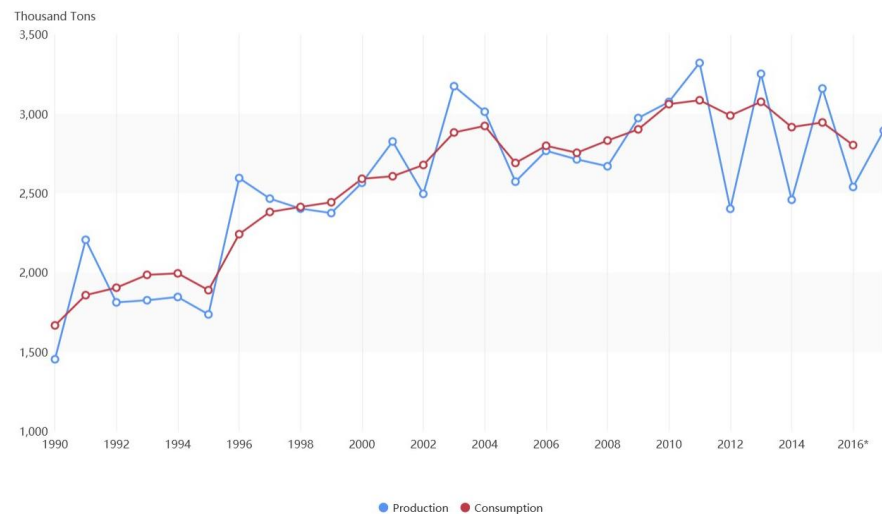
Source: IOC 2015

An important trend in production is the establishment of medium- to high-density groves with mechanized harvesting. Many Mediterranean countries that traditionally had relied on the supply of olives from small groves aggregated into cooperatives increasingly get the bulk of their olives from new high-density groves. These countries already have very high unemployment and face the likelihood that many small producers will lose their competitiveness and eventually their traditional income. Increased production efficiency and mechanization in larger groves marginalize traditional production and increase the gap between small producers and conglomerates. The intensification and mechanization results in reduced production cost. Spanish olive oil producers, with more than 40 percent of the world's production, maintain high volumes of olive oil production and practice an aggressive low price policy. Its olive oil companies acquire competitors to expand the production base into neighboring countries such as Portugal and Morocco. Consumers become familiar with the trademark of the major firms and insist on their products, a pattern that offers a competitive advantage to the selling firm. On the opposite side of the spectrum, SMEs do not have such economic power. To compete, they need to become hyper competitive in terms of volume and price or, alternatively, to implement more selective strategies focused on differentiation, targeted market areas, or both.

World consumption of olive oil increased 1.8-fold in volume between 1990 and 2016–17, according to the IOC. This upward movement has been located primarily in non-IOC member countries,¹⁷ whose share of world consumption climbed from 11 percent to 24 percent between the years of the reporting period (Figure 3). In 2015–16, the global volume of olive oil consumption was at about 4.6 percent higher than in 2014–15. In 2016-17, Global olive oil consumption was down six percent over the same period. Olive oil consumption in EU countries fell by 12 percent with the largest decreases occurring in Greece, France and Italy (Figure 4).

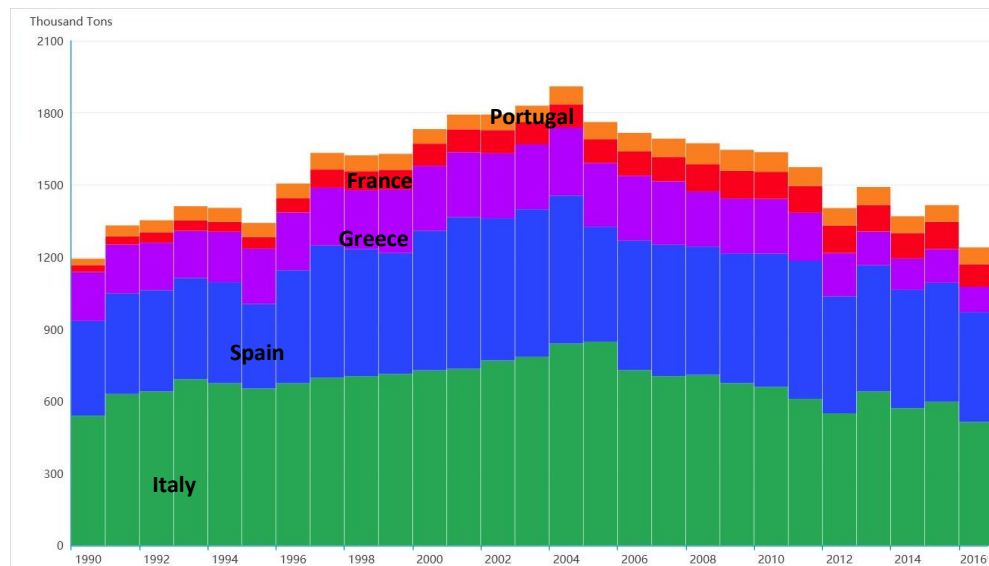
¹⁷ IOC currently has state members, plus the European Union. State members are Albania, Algeria, Argentina, Croatia, the Arab Republic of Egypt, the Islamic Republic of Iran, Iraq, Israel, Jordan, Lebanon, Libya, Montenegro, Morocco, Palestine, the Syrian Arab Republic, Tunisia, Turkey, and Uruguay.

Figure 3
World olive oil production and consumption
(2016/17 production year)



Source: IOC 2019

Figure 4
Trend of olive oil consumption in the European Union
(thousands of metric tons), 1990–91 to 2016–17



Source: Olive Oil Times, Dec. 2017

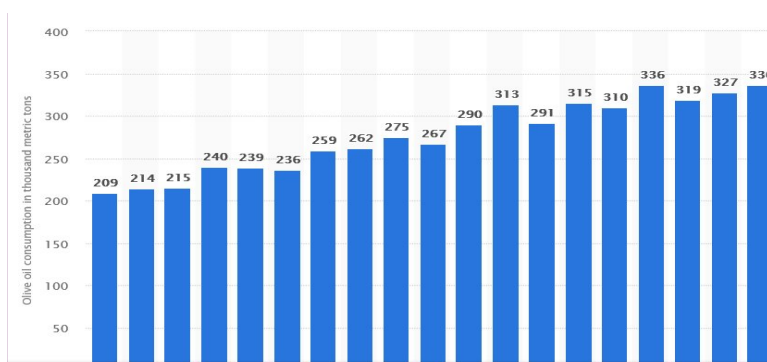
Inside the European Union, most olive oil is consumed in producer countries. Italy (12.8 kilograms of oil per person per year) continues to be the biggest European Union (EU) consumer in volume term although its level of consumption declined heavily until it fell from about 850,000 metric tons in 2005–06 to 514,000 metric tons in 2016–17. Spain (15.8 kilograms per person per year), where consumption has always oscillated, has also seen a decrease since 2005–06, and the volume of consumption has never reverted to earlier levels. Greece (26.4 kilograms per person per year) also has seen its

consumption drop, to 105,000 metric tons. This decrease in Europe coincided with the years of economic crisis and represents a fall of more than 23 percent over the past 20 years. The reduction in consumption is directly linked to the sharp decreases in the levels of production and resulting price hikes. Turning to other IOC members, consumption growth in recent years has been strong in Turkey and Morocco, where output has also risen. Consumption in Tunisia (3.6 kilograms of oil per person per year) fell between 2005–2006 and 2015–16 from 44,000 metric tons to 35,000 metric tons¹⁸.

Although consumption is concentrated in the producer countries, olive oil is starting to be consumed increasingly in the group of other nonproducer countries. Among non-IOC members, the United States has seen the most spectacular growth in total consumption over the past 18 years (+60,8%) even though U.S. per capita consumption in 2014 was only 0.9 kilograms.

Figure 5

Olive oils consumption in the United States from 2000 to 2018 (in 1,000 metric tons)



Source: Statista 2019

Between 2009 and 2016, world consumption substantially grew also in markets such as China (+78 percent), Japan (+80 percent), the Russian Federation (+76 percent), and Canada (+39.5 percent). The IOC estimates that, by 2020, 160 million Chinese households will have the purchasing power to include olive oil in their diets. Growth of world consumption is reflected in the ranking of main olive oil importers (Table 3).

Table 3

Main olive oil importer countries, 2016–17

Country	Import (metric tons, thousands)	Percentage	Percentage change from 2006
United States	305.0	39,05	+31,5
European Union*	90.5	11,52	-52,1
Others nonproducers	60.0	7,68	+44,6
Brasil	59.5	7,60	+128,8
Japan	54.5	6,97	+81,7
Canada	39.5	5,05	+31,7
China	39.0	4,99	**

¹⁸ Source: IOC Website

Australia	29.0	3,71	0
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**Without intra-community trade.*

*** No import of olive oil in China in 2006*

Source: IOC website, 2019

Global Consumption Trends

Olive oil is used in cosmetics, medicine, cooking, and soaps, and was also used as a fuel for traditional lamps. The global market in olive oil is expected to continue to grow at a moderate pace because of the expansion of its end-use segments (the food industry, pharmaceutical industry, and beauty care and cosmetics industry). In particular, the overall demand for olive oil in the food and beverage industry is expected to grow at a rapid rate. Mediterranean cuisine and food culture are increasingly emulated in many emerging economies, thereby driving the global olive oil market.

The increase in global olive oil consumption could be attributed to the rising standards of living in the developing countries and to the opening of their economies to international markets. Thus, residents of developing countries have the economic power to incorporate new products, such as olive oil, into their diets or to change their eating habits and try alternative healthy or healthier foods¹⁹. In particular, consumption has evolved toward high-quality olive oil, with typical tastes and clear origins linked to the history of a territory. Organic olive oil is among the most promising segments (Box 1).

BOX 1: THE MARKET FOR ORGANIC OLIVE OIL

Consumer awareness of the risks associated with the use of chemicals in food production has resulted in a rapid growth in organic farming in the past decade. In 2013, the area dedicated to organic farming worldwide was 43.1 million hectares, registering an increase of 14.9 percent over the previous year. In line with this trend, demand for organic products continues to grow up to 10 percent per year in the health food market (Xerfi Research 2015). The European Union represents an important market for organic food products of €18 billion per year, with Germany being the main market. The U.S. organic market is the world's largest, with sales of nearly US\$27 billion per year. Organic olive oil is no longer restricted to delicatessens but is present in supermarkets to satisfy the increasing demand. The spread of shops that specialize in “organic” products accelerates this trend and facilitates the purchase of premium olive oil, especially gourmet olive oil, the highest quality of organic olive oil, used for high cuisine and available only in specialized shops. Such a luxury olive oil advertises its specialized production with sophisticated packaging and a marketing story that sells emotions with the product. The use of the term “premium” to differentiate oils or the words “first day harvest extra virgin olive oil,” and so on are interesting because they associate olive oil with wines, a product that is better known among consumers. One risk of this strategy is that consumers may not be able to distinguish between the products.

¹⁹ The market offers various types of olive oils, such as extra virgin olive oil, light olive oil, pure olive oil, virgin olive oil, olive pomace oil, and refined olive oil. At present, extra virgin olive oil, with less than 1 percent acidity, is the highest quality olive oil, consumed by a majority of health-conscious customers. Organic extra virgin and extra virgin olive oil are a very similar quality oil, but one comes at a premium due to the organic documentation and certification process required. The olives are grown and the oil is produced in a very similar manner.

The pharmaceutical industry and beauty care and cosmetics industries are other key end users of olive oil. Olive oil is a central component of the so-called Mediterranean diet, which is especially beneficial for cardiovascular health. Studies of olive oil have shown that its consumption in the diet, particularly in the form of extra-virgin olive oil, is associated with lowered risk of cardiovascular disease, diabetes and other diseases. Concerning beauty care, in addition to being a natural, hypoallergenic way to moisturize skin, extra virgin olive oil has the added advantage of providing strong antioxidants, that help repair and renew skin. These nutrients have the natural ability to stimulate cells and return skin to a firmer, smoother, and healthier state. The steady growth of these industries is likely to boost the demand for olive oil. From this point of view, the case of Japan is significant (box 2).

BOX 2: THE CASE OF JAPAN

Japan has the highest olive oil consumption per capita in Asia. Between 2005 and 2015, imports of olive oil grew by 78 percent in Japan. According to a recent study (ICEX 2018), young Japanese women have also increased their interest in the use of olive oil for their skin and hair care. The average Japanese consumer is willing to pay more for products considered beneficial to health. For this reason, the main Japanese customers of olive oil are women over age 55. The main factor of the first olive oil boom in 1997–98 was the health value of the oleic acid in olive oil, but recently Japanese consumers have recognized values such as flavor and taste. Consumers have a deeper understanding of the use of olive oil as seasoning, and the recipes that use olive oil have become more varied. The growing importance of the olive oil taste can be seen through the slowing growth in sales of pure olive oil in contrast to the large growth in sales of extra virgin oil, creating a greater gap. The health benefits of these products, such as the presence of medium-chain triglycerides and omega 3, are expected to contribute to increased sales, especially with young women and the elderly. Although the aging of Japan's population is expected to contribute to growth in sales, the products are expected to remain niche items. Nevertheless, since the positive effects on health will continue to drive growth, rising sales of premium oils and fats are expected to continue, and to contribute to unit price increases.

2.3 NATIONAL OVERVIEW

Tunisia olive production fluctuates considerably from one year to the next, due to the phenomenon of the alternate bearing of olive trees and extremely unpredictable climatic conditions. Average annual production of Tunisian olive oil amounts to 176,000 metric tons per year (on average between 2006 to 2016), according to Tunisia's National Office of Oil (Office National d'Huile, or ONH). In 2014–15, Tunisia experienced a record olive harvest, producing 340,000 metric tons of olive oil, which, in that year, made it the second world producer after Spain. In the same year, Tunisia exported 304,000 metric tons of olive oil and was the largest exporter.

Olive oil production in Tunisia reached 100,000 metric tons in 2017, representing a 28.5 percent reduction from the 140,000 metric tons produced in the 2015–16 crop year. The recent fall in production is due to drought conditions in some olive-growing regions of the country.

According to ONH, cultivation of the olive tree provides some or all of the income for more than 309,000 farmers, who represent 65 percent of the total number of farmers in the country²⁰. The Tunisian olive orchard is spread over approximately one third of the country's crop area, constituting 1.76 million hectares of olive plantations. Ninety-five per cent of olive growing is rain fed in varying climactic conditions. Olive tree numbers in Tunisia are estimated at approximately 60 million (30% in the north, 45% in the centre and 25% in the south). Olive trees are mostly found in single-crop plantations, although they can also be found in combination with other fruit trees.

BOX 3: THE PRODUCTIVITY OF OLIVE TREES IN TUNISIA

In recent years, the average productivity of olive trees in Tunisia has been declining . ONH estimates that yields have decreased by 0.4 percent per year on average since 1990. In terms of yield per hectare, Tunisia ranks last among nine producer countries in the European Union and the Middle East and North Africa region. Yields in northern Tunisia can be compared to average yields in Morocco. However, those in the central region are only half that of Tunisia's international competitors, while yields in the southern region are more than four times lower. It should be noted, however, that in Tunisia olive trees are not only planted for production, but also often as a means to reduce land erosion and maintain gully control. Olive trees planted for that purpose reduce olive productivity per hectare. The main problems that affect yields are (a) weak infrastructure and lack of irrigation (irrigated areas represent only 3.5 percent of the Tunisian olive-growing area); (b) a high percentage of poorly maintained olive trees and poor agronomic practices, as well as low planting density and age of olive trees (ONH estimated that 54 percent of olive trees are 20–70 years old, while 15 percent are more than 70 years old); (c) a low level of mechanization; and (d) limited phytosanitary protection, lack of know-how, and lack of post-harvest investments.

Organic olive growing constitutes 40 percent of the total olive-growing areas in Tunisia and covers 125,000 hectares, the third-largest area in the world, after Spain (168,039 hectares) and Italy (176,000 hectares).²¹ The production of organic olive oil increased by 183 percent between 2006 and 2013 thanks to about 30 Tunisian producers. The export of Tunisian organic olive oil accounts for 12 percent of olive

²⁰ Employment in agriculture (% of total employment) in Tunisia was reported at 11.7 % in 2017, according to the World Bank collection of development indicators, compiled from officially recognized sources.

²¹ According to the International Federation of Organic Agriculture Movements (IFOAM) EU Group. Data refer to 2016.

oil exports, with a 10 percent higher selling price. Because of the traditional way of growing olives in Tunisia, the transition to “organic” cultivation is simple, with the main barrier being the cost of certification.

Currently, more than 70 percent of the production of Tunisian olive oil is of extra virgin quality (DGPA 2016). The quality of olive oil does not depend solely on variety or irrigation. The maturity of the fruit at collection, the collection equipment, the time between harvest and crushing, the processing equipment, the quality of the packaging, and the storage conditions have a direct effect on olive oil quality. Box 4 describes the two varieties that dominate the Tunisian olive crop.

BOX 4: MAIN VARIETIES

Tunisia has inherited a wealth of olive varieties thanks to its location at the intersection of important trading routes between many civilizations of the Orient, Africa, and Europe. Nevertheless, two varieties—Chemlali and Chétoui—make up the bulk of olive growing in Tunisia. The Chemlali variety occupies 80 percent of Tunisian olive groves, mainly in the Sahel, Center, and South. It has a slight bitterness with a sweet almond flavor and sometimes fresh apple. It loses its fruity taste with maturity and during storage. It is characterized by low oleic acid content (53–60 percent) and high palmitic acid content, which result in low oxidative stability and reduced polyphenol content. The Chétoui variety is cultivated in the north of the country and occupies nearly 20 percent of Tunisian olive groves. It has a high oil yield and is very high in polyphenols and tocopherols. Its low content of palmitic acid ensures its stability. Chétoui olive oil is characterized by an ample bitterness; its taste is slightly peppered with a tip of green almond (WBG 2019).

In 2017, Tunisia’s olive oil exports accounted for 5 percent of the world’s total, placing Tunisia fifth. On average, Tunisia exports 75 percent of its olive oil production. In 2017, trade value of Tunisian olive oil were US\$406.6 million, with an increase of 17,6 percent between 2014 and 2017²². More than 80 percent of exports are in the form of extra virgin oil and the rest are virgin or lamp oil. Most of the oil (90 percent) is exported in bulk. Organic olive oil accounts for 12 percent of exports, with a 10 percent higher selling price.²³

Table 4

Export of Tunisian olive oil, value and quantity, 2017

	Value exported in 2017 (US\$, thousands)	Quantity exported in 2017
World	406,640	95,287
Italy	141,807	33,719
United States of America	71,656	16,391
Spain	60,999	15,872
France	45,513	10,352
Canada	19,757	3,776
Portugal	16,111	3,574
Seyschelles	10,845	2,656
Morocco	8,938	2,383

²² ITC, Trade Map website.

²³ ITC, Trade Map website.

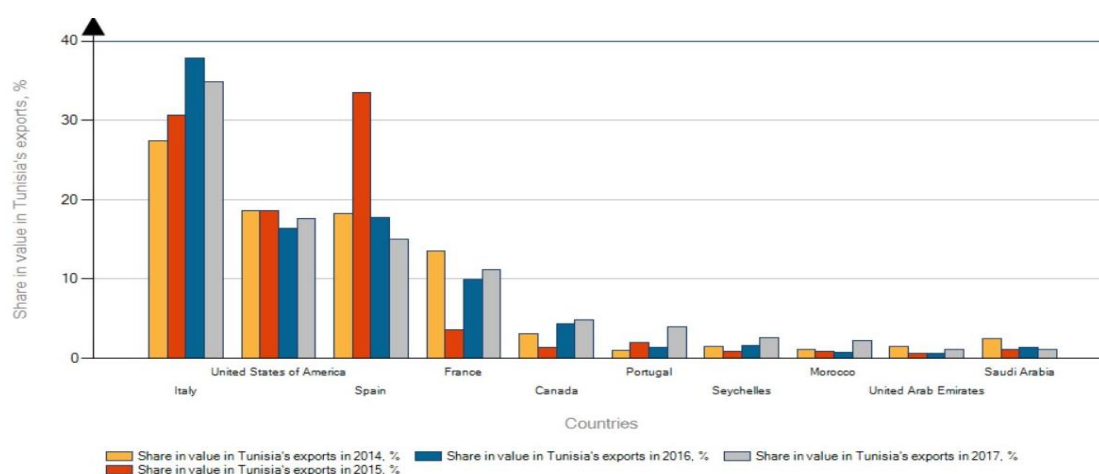
Arab Arab Emirates	4,514	888
Saudi Arabia	4,370	879

Source: International Trade Centre (ITC), Trade Map website, 2019

Main destinations for Tunisian olive oil were the EU, which took around 70 percent of the country's olive oil, and North America (17.2 percent) (Figure 4). Main European importers were Italy (34.8 percent), Spain (15 percent), and France (11.1 percent). Spain and Italy imported in bulk and used the olive oil mainly for re-exporting it using their own brands or for blending with their olive oils to improve certain criteria (such as taste, acidity, and richness in polyphenols).

Figure 6

Main markets of destination for Tunisian olive oil—export share in value, 2014–17



Source: ITC, Trade Map website, 2019

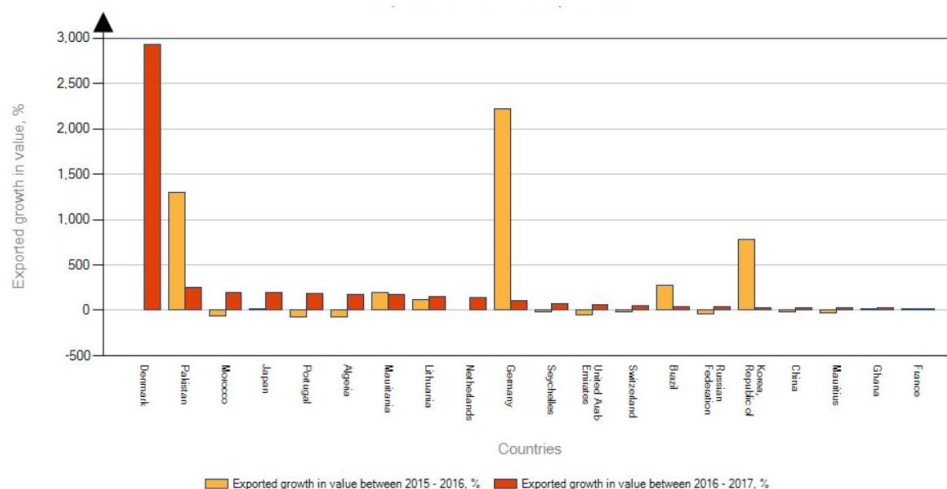
Historically, Europe has been the main destination for Tunisian olive oil exports, accounting for 90 percent or more of the value of exports up to 2006. The EU grants Tunisia an import quota of 56,700 metric tons at a zero rate of customs duty under the EU-Tunisia Association Agreement. In September 2015, the EU opened a supplementary temporary zero-duty tariff quota of 35,000 metric tons in addition to the existing 56,700 metric tons, from January 1, 2016, through the end of 2017.

ONH exports part of Tunisia's olive oil production without holding a monopoly: in March 2016 there were 274 private operators approved for exporting olive oil, mainly small enterprises, as well as two nonresident (offshore) foreign companies (WTO 2016). Some Tunisian exporters have succeeded in marketing gourmet oil (such as HO Domaine Fendri, HO variety Chétoui, and Byrsa). However, this development remains far below the potential and the ambitions set by sectoral and national development plans.

More recently, the government has encouraged export diversification and vertical expansion up the value chain and has promoted packaged exports over the more traditional bulk exports to Europe. This initiative has seen North America emerge as a significant export destination; however, the overall volume of exports from Tunisia remains erratic due to biannual variations in yield and climactic impacts (particularly drought). Concerning new markets, ITC statistics show a consistent increase in the value of exports to Denmark, Germany and Pakistan (Figure 7).

Figure 7

Import markets for Tunisian olive oil—export growth in value, 2015–17

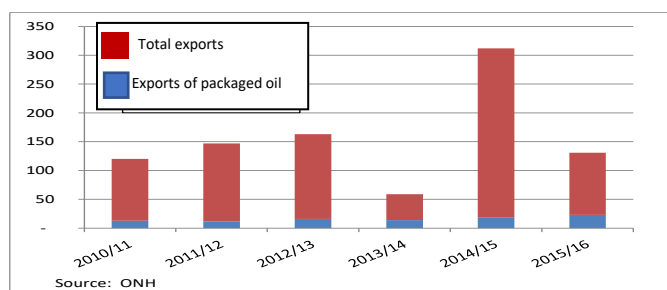


Source: ITC, Trade Map website, 2019

Despite the increase in the number of packing units in Tunisia from 9 in 2006 to 43 in 2011, exports of packaged olive oil represented only 6.5 percent of total exports in 2015 (ONH 2016)(figure 6). The quality of the bottles, the design, the packaging, and the promotion of the product do not yet enable full access to main markets. Logistics and processing techniques are not sufficiently developed: the delay between collecting and crushing olives often exceeds 24 hours, which degrades the quality of the oil. In addition, the fragmentation of land and the lack of organization among producers into production or development structures constrain the ability to increase productivity in the sector. Moreover, the Tunisian glassware company SOTUVER²⁴ is the only manufacturer of glass bottles in Tunisia, and the quality of the bottles does not fully meet the requirements of international markets.

Figure 8

Evolution of packaged olive oil exports in Tunisia, 2010–16 (thousand metric tons)

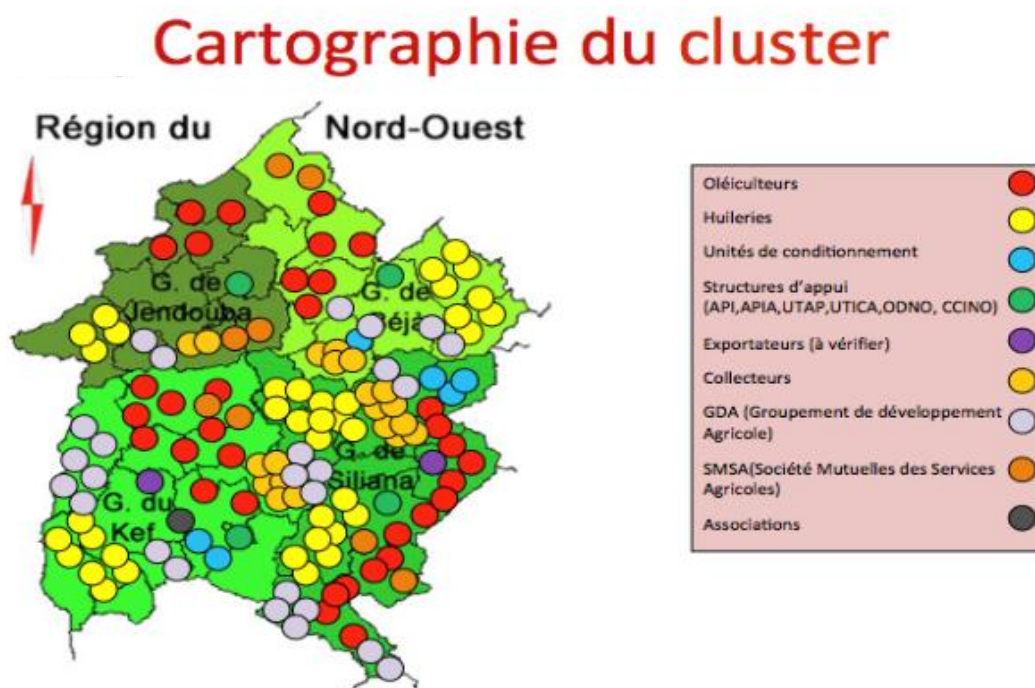


Source: ONH (Office National de l'Huile de Tunisie), 2016

²⁴ SOTUVER (Société Tunisienne de Verreries) became a private society in 1996. It has belonged to Group Bahahi (70 percent interest) since 2008 and has a quasi-monopoly on glass production.

2.4 CLUSTER ANALYSIS

The North West region includes the districts of Beja, Jendouba, Kef, and Siliana and has more than 75 olive mills (4.5 percent of the Tunisian olive mills) and 10 packaging units (25 percent of national units) and employs more than 860 workers. The olive coverage area includes 180,000 hectares (7 percent of the national land), of which 5,600 are organic. Average production is 90,000 metric tons per year (41 percent of national production) of organic olive oil, virgin, and extra virgin olive oil, of which 2,800 metric tons are organic (31 percent of national organic production). Despite the higher productivity and superior quality of the olive oil, only 18 percent of national crushing capacity is located in the North (DGPA 2017).



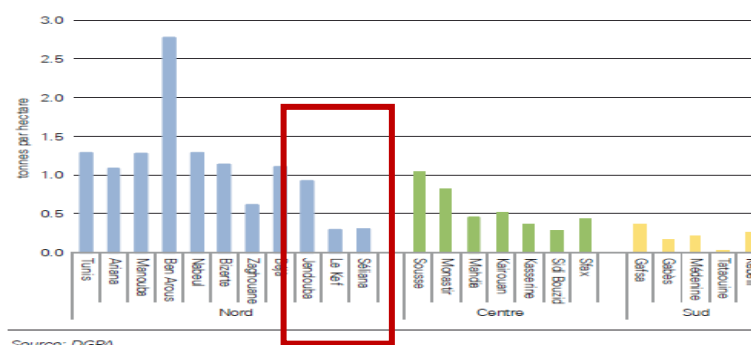
Source: Presentation « Initiative de renforcement de la compétitivité -Huile d'olive Nord Ouest de la Tunisie » prepared by Hela Zghidi – CTAA, Walid Fersi – API Sfax Mohamed Alibi – API SIDI BOUZID and Nadia Gouta - MDICI

In the North West, the density is 100–150 trees per hectare, and 7 percent of the olive grove area is covered with 16 percent of the national total of olive trees. Nearly all—90 percent—of the olive trees belong to the Chétoui variety and 10 percent are Gerboui and Oueslati. The Chétoui variety has some of the highest yields (28 percent in oil) and produces fruity oil, with a predominant aftertaste, that is highly appreciated for its phenolic content and as an antioxidant. Gerboui cultivar produces 25% of oil yield. It produces an oil with a flavor reminiscent of fresh fruit with a tinge of bitterness. Oueslati variety is grown in the Kairouan region. The oil extracted from this variety is well balanced and fruity, with low bitterness and a taste that is reminiscent of almonds. A recent trend is the increasing creation of SMEs and new attention to value chains from several support institutions such as the Commissariat Régional au Développement Agricole or Société Complexe Industriel et Technologique du Kef, as well as development partners such as Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH, L'Agence Française de Développement, the EU, and the World Bank Group.

The North West records higher yields than central and southern Tunisia, aided by high rainfall, high planting density, and the young age of olive trees. Costs per ton are the lowest due to the high density and the low labor costs. The average yield of olive production for the whole country is estimated at 0.8 metric tons per hectare. The yield is 904 kilograms per hectare in the North, 870 kilograms per hectare in the Center, and 650 kilograms per hectare in the South (DGPA 2017).

Figure 9

Yield of Tunisian olive production by district, metric tons per hectare

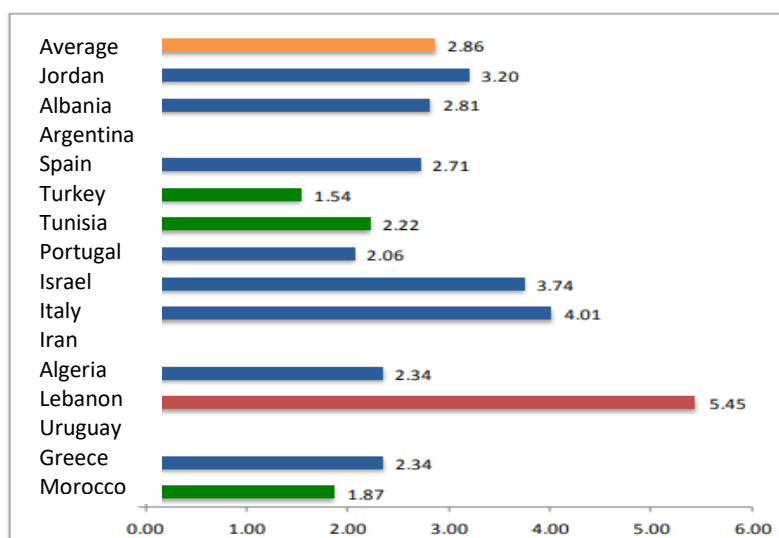


Source: Source: Ministry of Agriculture, Water Resources and Fisheries, DGPA (General Directorate of Agricultural Production).
Note: Red box shows the North-West region.

IOC estimates that, in 2015, in rain-fed conditions, the cost of production of olive oil in Tunisia varies between €2.22 and €2.36 per kilogram, depending on the typology of the ground. Figure 8 shows, for example, production costs in rain-fed conditions and moderate slopes.

Figure 10

Production costs of olive oil, euros per kilogram
(traditional rain-fed conditions on moderate slopes)



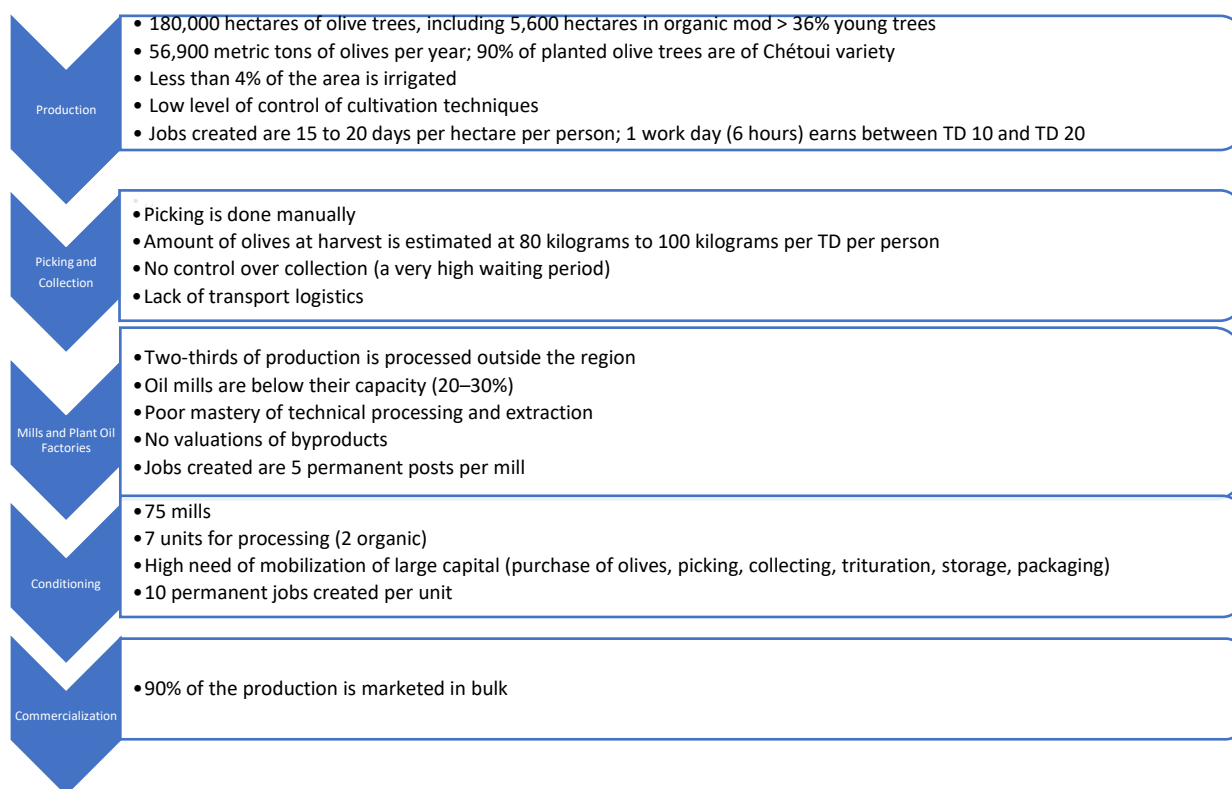
Source: International Olive Oil Production Costs Study, IOC 2015

Yet the North West faces some major constraints. Productivity,²⁵ particularly in Kef and Siliana, is among the lowest in the Mediterranean area (about five times lower than in Andalusia, Spain). Productivity is so low because of the lack of expertise (such as in cultivation techniques and protection of the trees), the small size of the producers, lack of supplemental irrigation, insufficient training and research capacity, and negligence by landowners. Other main constraints to this progress are the aging of olive trees (more than 15 percent of which are probably over 70 years old), lack of access to credit, and the weakness or inadequacy of mechanization (FAO 2015).

On the market side of the value chain, the analysis found that the Chétoui variety has a strong commercial potential which has recently been confirmed by its presence in the high-value European, American, and Japanese markets. However, to exploit this potential, several issues will have to be solved throughout the North-West olive oil value chain (Figure 11). In particular, the various activities along the value chain need to be coordinated to reduce transaction costs and increase value addition at each stage. In the North West, the production system consists of 75 oil mills and 7 packing units. But only 30 percent of this capacity is exploited because most the olives produced (two-thirds) in the North are triturerated in Sfax or in the Sahel (ONH and the analysis of the team).

Figure 11

North West olive oil value chain main features



Source: Value Chain Development Training Program

²⁵ Productivity is measured in metric tons of olives per hectare or in kilograms of olives per olive tree.

2.5 STRATEGIC MARKET SEGMENTATION

A strategic market segmentation determined the most attractive markets and segmented them for further exploration and effective targeting of selected segments.²⁶ Subsequently the product can be clearly positioned within the target market.

The team identified three products (Virgin Olive Oil, Extra Virgin Olive Oil, and Olive Oil Gourmet) and two markets (Seasoning and Cooking). The combination gave rise to three potential segments (table 5).

For each segment, an analysis of the margins was made. Data on the strengths for each segment leads to the identification of the most “attractive” market segments for the North West olive producers.

Table 5

Synthesis of main olive oil markets based on consumption trends

<div>Markets Products</div>	Seasoning	Cooking
Virgin Olive Oil		A
Extra Virgin Olive Oil	B	
Olive Oil Gourmet	C	

Source: Value Chain Development Training Program

- A. **Virgin olive oil for cooking** is an unrefined oil for which no chemicals or heat is used when extracting oil from the fruit. It maintains the purity and taste of the olive, though production standards are not as rigid as for other oils. It is considered a “commodity” that satisfies the basic needs of buyers. Rivalry is strong and availability is wide, with several substitutes (vegetable oils) available and low entry barriers. The buyers’ bargaining power is very high because immense volumes are available that satisfy the quality of the segment and that are relatively easy to attain. Worldwide, 71 percent of production comes from Italy, Spain, and Greece. Competitiveness depends mainly on ultra-high productivity and low price, less on differentiation. *The segment attractiveness is weak for the exercise’s targeted beneficiaries (bottom 40% and small producers in NW).*
- B. **Extra virgin olive oil (seasoning)** is a higher-quality oil. Olive oil must meet specific standards to receive the label “extra virgin.” Because of the way the oil is made, it retains more authentic olive taste and has a lower level of oleic acid (no more than 0.8 percent) than other olive oil varieties. It also contains more of the natural vitamins and minerals found in olives. It is considered an unrefined oil because it is not treated with chemicals or altered by temperature. Availability is wide and competition is very high. The main purchase criterion is price. A current trend is the increasing sophistication of buyers who are interested in more information about organoleptic characteristics and the origin of the product. Intermediaries and distributors hold market information and can buy the product from many suppliers. They have strong bargaining power and good margins, and they

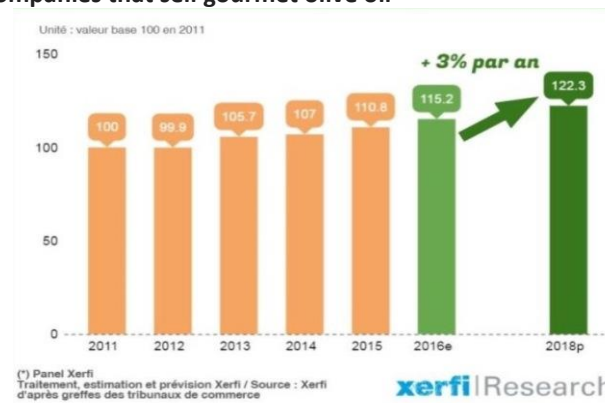
²⁶ The segmentation exercise is illustrated in annex A (“Methodology Used the Segmentation Exercise”).

put pressure on suppliers. *The segment is not attractive because most of the margin goes to intermediaries.*

- C. **Gourmet Olive Oil (seasoning)** is associated with the concept of the highest quality and is on sale in specialty shops and at luxury restaurants.²⁷ “Gourmet” olive oil is a highly-differentiated product, with strong value added, few surrogates, and high entry barriers. Consumers and buyers of this product are more demanding than for the other olive oils. Production is more complex because attention is paid on quality control.²⁸ Marketing strategies are focused on consumer loyalty. Producers have more bargaining power and, consequently, a higher margin. *The segment attractiveness is high.* Xerfi Research 2015 estimated that revenues of the studied companies would increase by an average of 3 percent per year by 2018 (Figure 12).

Figure 12

Evolution of revenues of companies that sell gourmet olive oil



Source: Xerfi Research 2015

Note: The study examined revenues of a panel of companies in the sector.

While olive oil consumption grows steadily in multiple market segments, “gourmet olive oil” is the market segment through which producers of the North West of Tunisia are most likely to develop a durable competitive advantage. In this segment, the North West could also generate large positive externalities and spillovers. The following section will focus on constraints that would prevent local

²⁷ Organic olive oil can be in all three segments as a sign of quality, but if it is not accompanied by a strategy of differentiation (in high quality packaging, characteristics specific to the variety of olives, its mode of crushing, and its history) and promotion through deli distribution (épicerie fine) it cannot be sold in the gourmet segment. According to the report of the Carnets of the BIO Agency in 2016, organic olive groves represent 6.1 percent of the world's olive groves. In 2014, 627,748 hectares of olive groves were certified organic and in conversion (a 2.4 percent increase over 2013). Of these organic olive groves, 78 percent were located in Europe and 20 percent in Africa (mainly in North Africa). Main producers of organic olives are Spain (172,391 hectares), Italy (170,067 hectares), and Tunisia (124,123 hectares). In Italy, 14.8 percent of olive groves were organic in 2014, in Spain 6.9 percent were organic, and in Tunisia, 6.8 percent were organic. France has the largest share of organic olive groves, with 27 percent in 2014 and 28 percent in 2015. Olive oil accounts for about 80 percent of organic exports of Tunisian products in value.

²⁸ As an idea of the potential size of the market and of the number of local producers that can realistically target it, API (Agence de Promotion de l'Industrie et de l'Innovation) estimates (2016) that the national industry has 1,679 oil mills with a theoretical capacity of 43,053 metric tons a day, 40 packaging units with a total capacity exceeding 165,000 metric tons per year, and 100 SMEs registered with API that operate in the packaging and export of olive oil. In the North West there are 30 processing units (in Beja, Siliana, Kef, Jendouba, and Bizerte), 23 percent of the national capacity for crushing olive oil, and a project to extend olive plantations.

producers from targeting this segment and what actions should be taken to capture the opportunities this segment offers for Tunisia in general and for the North-West in particular.

2.6 OPPORTUNITIES IN THE GOURMET OLIVE OIL MARKET AND MISSING LINKS

The global trend in consumption of gourmet olive oil is mainly motivated by the need for a healthy diet, as well as the value assigned to a specific flavor and taste. Valued in France at €5 billion (Les Echos Études 2018), gourmet olive market continues to grow,²⁹ thanks to the expanding interest of the French and other Europeans in “good eating” of “homemade” products from local produce and gastronomy.³⁰

BOX 5: BEST CHEFS IN EUROPE CHOOSE TUNISIAN OLIVE OIL

Some of the best chefs in Europe choose Tunisian olive oil for their culinary creations. During the Olio Nuovo Days, an essential event devoted to olive oil that takes place every winter in Paris, Parisian chefs were introduced to several quality Tunisian olive oils through blind tastings. Star chef Akrame Benallal from Akrame restaurant chose Chétoui oil from the Domaine de Segermès, while other top chefs have selected other high-quality Tunisian olive oils such as Fendri. Chemlali from central Tunisia and Moulins Mahjoub, another Chétoui oil from northern Tunisia, were also favorites. All these extra virgin olive oils are produced organically on family farms that use traditional production methods. Emmanuelle Dechelette, professional olive oil taster and founder of the Olio Nuovo Days, said that Tunisian olive oils inspire chefs: “Before, chefs turned to a neutral oil that goes with everything,” she said. “But now they are looking for oils with more character and even using olive oil as a starting point. Tunisian oils have character and can even inspire a dish. The chefs in France are starting to know them and appreciate the Chétoui oils because they are intense and green while enjoying the oils Chemlali for their fruity nuances.” (Lahmar 2018.)

Consumers increasingly prefer to know about the ethical and environmental conditions of production before they make a purchase. The value of the product is therefore emphasized by its packaging and positioning (sophisticated design of the bottle, storytelling around ethical and emotional value). This is particularly relevant because the high-end segment of olive oil, the “gourmet” product, can speak for the rest of olive oil production and create a country reputation.

To successfully compete in such a market, gourmet olive oil produced by the cluster has to be highly differentiated and meet the level of sophistication requested by demanding consumers. Specific attention should be given to the quality of the product as well as its positioning (including packaging and marketing) to improve customer attraction to Tunisian olive oil from the North West (Box 6). From this point of view, as a permanent member of the International Olive Council, Tunisia already applies quality standards both on the national and international level and respects the use of the certification labels. Indeed, all exported Tunisian olive oils are systematically analyzed to verify their conformity with international standards.

²⁹ Xerfi Research 2015.

³⁰ According to a study being finalized by Echos Etudes, “the market for delicatessen and luxury food products is following a positive growth trend, despite a tense economic environment and low purchasing power. It is a difficult market to understand, because there are no specific statistical codes.” The market was estimated in 2011 at €5.3 billion. Revenues of the panel companies are expected to grow by 3 percent per year. (*Les Echos Etudes 2018*). <https://www.lesechos-etudes.fr/etude/le-marche-du-snacking-2018/>

BOX 6: THE OLIVE OIL DIFFERENTIATION STRATEGY

An olive oil differentiation strategy aims to position the product as unique in a chosen market segment that particularly appreciates its distinctive features and has the purchase power to reward it adequately. Differentiation thus attempts to secure and exploit internal and external attributes that are highly valued by consumers (such as quality, health benefits, geographical region, brand, origin, and production method).

Awareness of exact consumer preferences constitutes the first step in the definition of marketing strategies and related policy choices regarding the product itself, its price, communication, and distribution. Producers should be well aware of where they position themselves in terms of their competitive advantage and should devise their strategies and investment accordingly.

Due to logistical and resource constraints, the training exercise did not allow for a deeper strategy formulation following extended stakeholder consultations. Follow up work , would involve interviews with advanced buyers in destination markets to fully capture market demands. Both technical requirements and contacts with advanced buyers would subsequently be shared with firms that participate in the value chain development exercise.

The gourmet olive oil segment represents an ideal opportunity for Tunisian producers to increase their margin with efforts to further improve the quality of their oil and to focus on sustainable agricultural techniques and inclusive labor practices.

The improvements needed to compete with advanced global players in this market remain a big challenge for Tunisian entrepreneurs (Figure 13). The lack of information on such markets, their specifications, and their players is one of the key aspects a value chain development effort can start to address in order to identify missing services, investments, or regulatory reforms needed to increase competitive advantage in these segments.

In the case of gourmet olive oil, team identified the following weak points in the chain:

- **Production** is mainly based on handpicking of the olives, low levels of irrigation (less than 4 percent of the area) and insufficient control of cultivation techniques and farming operations (olive maturity, yield, irrigation). Consequently the chain has low productivity, worsened by a limited mastery of the sequencing of olive processing stages (a very high waiting period) and lack of transport logistics.
- **Post-harvest** is characterized by two-thirds of production transferred out of production zone. In addition, oil mills are below their capacity (at 20–30 percent); and the chain has insufficient quality control (lacks a certificate of analysis) from food safety standards point of view. Weak storage conditions and inaccurate conditioning complete the main issues identified in the post/harvest phase.
- **Distribution** is based on a traditional distribution network and logistics, lacking a focus on sophisticated clients (luxury restaurants and delicatessens). The product is mainly sold in bulk directly to the client and without the possibility of differentiation. Marketing is not adequately developed and consumers are insufficiently informed about the quality and features of the oil.

Figure 13

The price advantage of specialized olive oil segments



Source: Value Chain Development Training Program

2.7 WHAT IT WOULD TAKE TO SEIZE THIS OPPORTUNITY

To compete in the market of gourmet olive oil, entrepreneurs of the North West region need support and a series of services they currently lack. From the legal and institutional point of view, a managing unit for olive oil could ensure coordination between the various actors in the chain and the different support structures and could focus on a revision of the legal framework to facilitate coordination and operations from production to export. The recently created Value Chain and Cluster Development Taskforce is a step in this direction (see annex B).

The options at the different stages of the value chain can be split into three broad categories: Production, Post-harvest, and Marketing.

Production. Gourmet olive oil requires sophisticated control of cultivation and of the technology used. Actors in the chain need to be informed and educated. It is necessary to provide knowledge and know-how to improve production, align to international standards (for planting, irrigation, size, and harvest), and reinforce producers and workforce capacity (for rural women in particular). The following actions could be taken within a period of six months:

Action 1. Define and realize a training program adapted to the local context, to sensitize and professionalize local growers.

Action 2. Develop and master agricultural production technologies that enable upgrades to agricultural holdings and improvement of olive yields per hectare. The development of production technologies and the establishment of sustainable production systems can be accomplished through the “Olive Tree Institute.”³¹ The dissemination of research findings to all players in the value chain should enable them to harness the findings and improve their products.

Action 3. Establish a team of coaches (guides) to assist in the change of habits in the field. Establish a program of visits to the field.

Post-harvest. The process to transform olives to oil needs to comply with the highest requirements in terms of hygiene and quality. These standards must be met from the transport of the olives to the conditioning of the olive oil so that the product retains its properties without any alteration. The quality standards should be controlled by a specialized institution at every stage of the process. The main actions are

Action 1. Improve the transport modalities of olives to meet the higher standards and to guarantee transport of the olives in time for the trituration of olives within 24 hours (mechanization, sorting, and crating) and to provide a modern supply chain of olives from producers to oil mills. Realize alternative solutions and investments, as needed, to improve the rural road network.

Action 2. Improve processing operations (quality control, packaging) to focus on upgrades to oil processing plants for hygiene and food safety and train the relevant cluster agents to obtain gourmet olive oil (for all stages: washing, decanting, centrifuging, and filtering) and establish quality control and tests performed by specialized organizations.

Marketing: Producers must bring the product to the international market in a volume and packaging that meets the demands of consumers. The potential of gourmet olive oil in North West Tunisia is high,

³¹ The Olive Tree Institute is the Tunisian research and development center on olive trees.

but marketing is needed to increase the visibility of Tunisian olive oil, and North West olive oil in particular,³² with a focus on these activities:

Action 1. Support first-class packaging design at the cluster level to create a perception of Tunisian gourmet olive oil as exceptional. Local talent and resources such as, for example, students and alumni from the Higher Institute of Arts and Crafts in Siliana could be involved in the packaging design.

Action 2. Implement a market development strategy for gourmet (high-end) products that uses knowledge of customer preferences in high-value markets to create a brand image for olive oil of Tunisian origin. An analysis of market trends shows strong potential for value creation in the gourmet market through a strategy of differentiation based on a product (organoleptic characteristics, packaging design, flavors, and so on) and a promotion policy (as health products, for wellness, luxury gastronomy, Mediterranean diet, fair trade) based on innovative and attractive labels.

The key of the strategy will be the identification of distribution networks (controlled by producers) that will target advanced buyers abroad (for specialized boutiques, delicatessens, luxury hotels and restaurants, among others). The activity will be complemented by product presentations at international conventions and fairs, such as the Sousse International Olive Fair, with hundreds of participants from Europe and the Middle East. In addition, other promotional events, such as school visits and gourmet tastings, will be organized to enhance local knowledge of gourmet oil.

Action 3. Introduce financial products adapted for and accessible to the various actors in the sector, through the preparation and development of a specific financing action plan for the olive oil value chain in the North West, in collaboration with financial institutions, with specific attention to young entrepreneurs.

BOX 7: PUBLIC-PRIVATE DIALOGUE

A key instrument of the adopted approach will be **public-private dialogue** (PPD), analytically supported and market-oriented, to map out optimal value chains and identify missing common services. The PPDs will particularly help with:

- **Identification of barriers** through documentation and analysis of existing data; interviews with selected value chain actors to gather information about the local cluster, determine who is involved, and identify who the innovators and champions are; registration of local actors and identification of potential beneficiaries with information to create the baseline (name, telephone number, annual income).
- **Strategic orientation** through travel or visits to meet advanced buyers in the most attractive strategic segment of the value chain and to gather advanced buyers' criteria; strategic group meetings with selected group agents to confirm the new value chain strategy; thematic working groups based on identified lines of action to improve the value chain (such as to improve production and gain access to markets and financing) to confirm ownership of the actions needed for the cluster.
- **Definition and preparation of the activities** through the elaboration of a Value Chain Improvement and Investment Plan that would include specific action lines and a quantified investment plan with relevant ministries and implementing agencies; support to companies and producers who have individual projects aligned with the agricultural policy of destination markets; preparation of investment projects in shared services (development of terms of reference, budgeting, and so on); and application for funding.

³² In June 2016, during the New York International Olive Oil Competition, no olive oil originally from Tunisia was awarded. Even though Tunisia is the fifth-largest producer in the world and among the larger exporters, much remains to be done to meet the international demand for high-quality olive oil. For example, a distinctive story linked to the origin of the olives must be carried out in order to make this product known to consumers in countries where the consumption of olive oil is newly introduced into diets and where strong growth is recorded.

Box 8 provides an example of how other governments have supported olive oil producers in a similar situation in Spain. A hypothetical example of how such an enterprise support service could be implemented in Tunisia, based on a model used by a recent World Bank project, is presented in annex C.

BOX 8: HOW ARAGON HELPED ITS PRODUCERS MOVE TO GOURMET OIL

Twenty years ago, all the olive oil produced in the area of Spain's Lower Aragon was sold in bulk to Italian traders. They would repackage it and sell it as Italian gourmet olive oil or use it to enhance the quality of their own oil. The local producers did not capture the value that their olives were creating. They knew they had a good product—since the time of the Roman Empire, their oil had been exported—but they didn't have the capabilities to sell it well.

The regional government of Aragon stepped in and (a) brought its strategic analysis capabilities to help the farmers identify the "gourmet segment," (b) facilitated access to advanced buyers (by organizing trips abroad), and (c) helped restructure the sector so that it moved beyond the traditional cooperatives to facilitate the creation of a "gourmet" commercialization structure.

A specialized consulting firm designed gourmet packaging and a new brand, "Reales Almazaras de Alcaniz," which was presented at international oil competitions with great success. But there were also great efforts to raise the level of knowledge about olive oil among the local population, including an annual event during the first oil press, a series of school trips to teach students about oils, and the collaboration of the best chefs to diffuse the proper use of gourmet oil to the community.

That effort prompted many other local producers to improve their packaging and marketing to serve the gourmet market. Today multiple small producers compete in this segment and offer products from oil to cosmetics and even oleo-tourism at their farms.

Farmers need much more than agricultural extension services or financing—they need business strategy advice, coaching, and access to common services such as quality control, packaging design, and international marketing. Furthermore, farmers need to rally other farmer-entrepreneurs to pursue the new segment and to work together to achieve the economies of scale necessary to obtain those common services.

To realize the options illustrated here, the team suggested that an initiative for the development of the olive oil value chain in North West of Tunisia be structured along seven strategic axes (Figure 14). The implementation of these actions will be incorporated in upcoming WBG operations.

Figure 14

Strategic axes for the development of the olive oil value chain in the North West of Tunisia

Les axes stratégiques de développement de la CVHO au NO	
1 Cadre juridique et institutionnel	Création d'une Unité de Gestion par Objectif pour l'huile d'olive qui assure la coordination entre les différents maillons de la chaîne et les différentes structures d'appui (ONH, API, CTAA, Packtec, CEPEX...) Révision du cadre juridique pour faciliter la coordination et les opérations de la production jusqu'à l'exportation.
2 Stratégie de développement du marché des produits gourmets	L'analyse des tendances des marchés, montre un fort potentiel de création de valeur sur le marché des produits gourmets. Une stratégie de différenciation basée sur une politique produit (caractéristiques organoleptiques, packaging, design emballage, saveurs,...) et une politique promotion (produits santé, bien être, gastronomie de luxe, diète méditerranéenne, Commerce équitable) avec Labels (Social, Paix, tradition millénaire)
3 Développement de la logistique d'approvisionnement	Développement d'un système de collecte des olives après cueillette pour assurer une trituration rapide ne dépassant pas les 24h. (mécanisation, tri et mise en caisse). Mise en place d'une chaîne d'approvisionnement d'olives des producteurs vers les huileries.
4 Développement et maîtrise des technologies de production agricole	Mise à niveau des exploitations agricoles et amélioration des rendements d'olives à l'ha par le développement des technologies de production et la mise en place des systèmes de production durable.
5 Développement de la logistique d'exportation	Développement d'un système de logistique d'exportation en optimisant les différents supports à l'exportation existants et en renforçant la coordination entre les organismes d'appuis impliqués dans l'opération d'export
6 Produits financiers adaptés et accessibles	Elaboration d'une stratégie de financement spécifique à la chaîne de valeur HO au Nord Ouest, élaboration d'un plan d'action spécifique en collaboration avec les institutions financières.
7 Recherche agronomique appliquée	Dynamisation de la recherche sur l'olivier au niveau du centre de recherche et de Développement sur les olivier, « Institut de l'Olivier » avec une focalisation sur la recherche variétale et l'amélioration de la productivité, Recherche agronomique pour l'amélioration des rendements, Mode Bio certifié

Source: Value Chain Development Training Program

3. HOW TO ENHANCE COMPETITIVENESS AND JOB CREATION FOR TOMATO VALUE CHAINS IN KAIROUAN AND SIDI BOUZID

3.1 MAIN FINDINGS

Tomato is the most produced vegetable in the world (16 percent of total vegetables grown). The amount of tomatoes produced in the world has increased steadily over the period 1994–2017 (FAOSTAT, 2019). As diets in developed countries become increasingly oriented toward fresh and natural products, the consumption and trade of fresh tomatoes—as opposed to processed tomato products—becomes increasingly predominant. In 2017, more than 70 percent of the global production was intended for fresh tomato consumption. Tunisia is the 16th largest producer of tomatoes in the world, but Tunisia uses 75 percent of its production for processing (double concentrate tomato, or DCT) in comparison to the 30 percent being used for that purpose worldwide (DGPA 2016). Tunisia’s production does not align with international trends, a situation that indicates that a market-oriented shift might be necessary to sustain the competitiveness of the Tunisian tomato industry.

The segmentation exercise conducted in the context of the training program concluded that the most attractive segment for the cluster of tomato production in Kairouan and Sidi Bouzid is off season fresh tomatoes for demanding consumers.³³ As part of their diagnostics exercise, the team focused on the two governorates, which account for almost 30 percent of Tunisian tomato production. In the fresh tomato market segment, largely concentrated in Western Europe but also in Russia, consumers are increasingly demanding for quality, freshness, and flavor of the fruits. Producers able to meet the demand for high-quality fresh fruit have a greater price margin and more bargaining power.

The team proposed a series of strategic interventions for different stages of the value chain. Accordingly, production should focus on varieties of tasty and authentic tomatoes, and the development of workforce skills, good farming practices, and agronomic improvements (for the off season) deserve attention going forward. Transport has to be upgraded and needs refrigeration with constant and thorough checks. Post-harvesting requires a system of quality control and traceability through production. Distribution should be in smaller batches and climatic conditions should be controlled as the produce moves to the marketplace. Promotion should be based on a strategy of differentiation and a distribution network focused on sophisticated customers.

The exercise recommended an initiative to develop value chains to tap into markets that demand higher value addition , structured around the following activities: (a) improve supply logistics services to allow better access to markets for small holders and producers; (b) support investment in off-season tomato production for export, in lieu of low value added production (maintaining or even reducing total water use); (c) support related tomato production technologies (d) create a research program on tomato varieties with capacity building for farmers, technicians, and engineers; (e) support investments in packaging; and (f) elaborate and implement a strategy to promote and connect the fruit and vegetable distribution platforms in Europe. Some of these activities address critical coordination failures that individual producer cannot solve, and therefor justify public policy interventions.

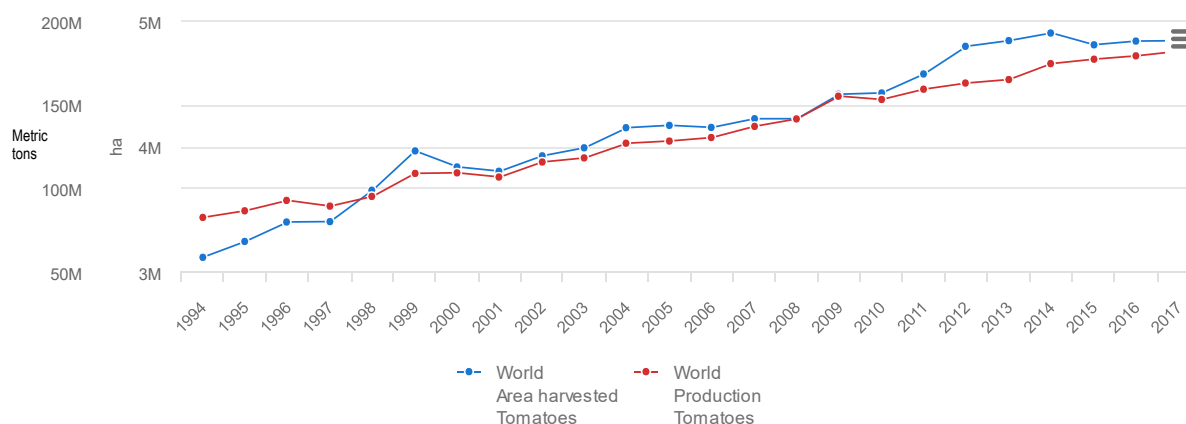
³³ See section 1.4 and Annex A for a synthesis of the methodology adopted in this exercise.

3.2 TOMATO GLOBAL OVERVIEW AND SECTORAL TRENDS

Tomato is the world's leading vegetable produced, and in 2017 the total volume of tomatoes produced worldwide was more than 177 million metric tons. Statistics from the FAO show that the amount of tomatoes produced in the world has increased steadily over the period 1994–2017 (Figure 15).

Figure 15

Production/yield quantities of tomatoes in the world, 1994–2017



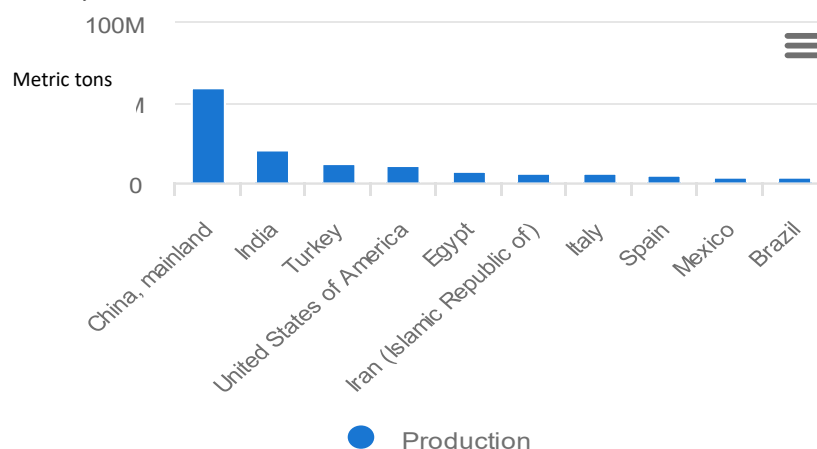
Source: FAOSTAT database, 2019

Note: M = million; ha = hectare.

The largest tomato producers are China (59.5 million metric tons), India (20.7 million metric tons), Turkey (12.7 million metric tons), the United States of America (10.9 million metric tons), the Arab Republic of Egypt (7.2 million metric tons), the Islamic Republic of Iran (6.1 million metric tons), Italy (6 million metric tons) and Spain (5.1 million metric tons).

Figure 16

Main tomato producers, 2017



Source: FAOSTAT database, 2019

The recent rise of China and India as tomato producers has shaken up global tomato production, and countries that have traditionally produced tomatoes have slowed down. Tomato production increased

by almost 40 percent in China and around 100 percent in India between 2008 and 2017, In the United States, It declined by 20,4 percent over the same period (Figure 17).

Figure 17
Evolution of tomato production by country, 2008–2017



Source: FAOSTAT database 2019

More than 70 percent of tomato production is intended for consumption in fresh condition, and the remainder is used for processing as triple and double concentrate (TCT and DCT), coulis, sauces, and ketchup, and—in much smaller quantities—dried tomatoes. Different varietal properties distinguish tomatoes intended for consumption in fresh form from those intended for processing. Fresh varieties are juicier and tastier and are picked before maturity. Tomatoes used for processing are richer in dry matter, grown in open fields, and harvested at full ripeness with a pronounced red color.

As diets in developed countries become increasingly oriented toward fresh and natural products, the consumption and trade of fresh tomatoes becomes increasingly predominant over processed tomato products. Companies leading the fruit and vegetable processing sector (such as Bonduelle, Conserve Italia Group) have expanded their product lines with fourth-range products (fresh, ready-to-use products) to increase their market share. The big distribution brands follow the same trend and offer fresh tomatoes of different varieties, packed in practical and individual packaging. In the processed sector, especially for sauces and ketchup, the originality, taste, and authenticity of the recipe and the societal aspects linked to production are major criteria used by consumers to choose products. The same reasons explain the development of the dried tomato market, though it is still a small one.

Fresh Tomatoes

Between 2003 and 2013, the production of fresh tomatoes increased by almost 50 percent to 130 million metric tons.³⁴ As the consumer's awareness of the health-food relationship and the benefits of the Mediterranean diet increases, a trend in most developed countries moves toward demand for products that are fresh and natural. Moreover, the increasing demand is invariant to seasons which necessitates additional off-season tomato production. In response, a diversification of tomato varieties has emerged. In the Mediterranean basin and Europe, the main tomato-producing countries for fresh and off-season consumption are France, Italy, Morocco, Spain and the Netherlands.

Trade in fresh tomatoes in 2018 amounted to 8,1 million metric tons, worth US\$9,439 billion.³⁵ According to ITC, imports increased by 0,1 percent in value and 8,9 percent in quantity between 2014 and 2018 (table 6). The period of high demand is the off season—that is, from November to May.

Table 6

Main importers of fresh tomatoes, 2014–18 (US\$, thousands)

Importers	Imported value in 2014	Imported value in 2015	Imported value in 2016	Imported value in 2017	Imported value in 2018
World	9,425,883	8,589,099	8,760,213	9,170,358	9,439,219
United States of America	2,055,036	2,030,230	2,362,853	2,272,435	2,486,067
Germany	1,472,880	1,304,905	1,296,246	1,490,738	1,466,406
France	647,703	616,790	635,021	703,981	706,883
United Kingdom	682,008	646,292	613,629	672,518	699,939
Russian Federation	1,044,719	676,380	490,582	558,745	629,841
Canada	322,668	312,444	345,963	331,333	322,069
Netherlands	354,204	305,308	306,797	346,602	320,040
Poland	200,041	175,052	161,740	201,807	242,255
Iraq	67,841	145,025	146,402	126,508	195,023
Sweden	186,245	163,201	165,319	168,939	170,186

Source: ITC, Trade Map website, 2019

Because fresh tomatoes are so perishable, destination markets must be close to the producing country. However, appropriate collection and transport logistics make it possible to extend the period between collection and consumption by up to 10 days and thus make it possible to reach more distant markets. Except for China, most of the fresh tomato exporting countries send their products to markets less than 2,000 kilometers away (Figures 18 and 19).

³⁴ FAOSTAT database.

³⁵ ITC, Trade Map website, 2017.

Figure 18

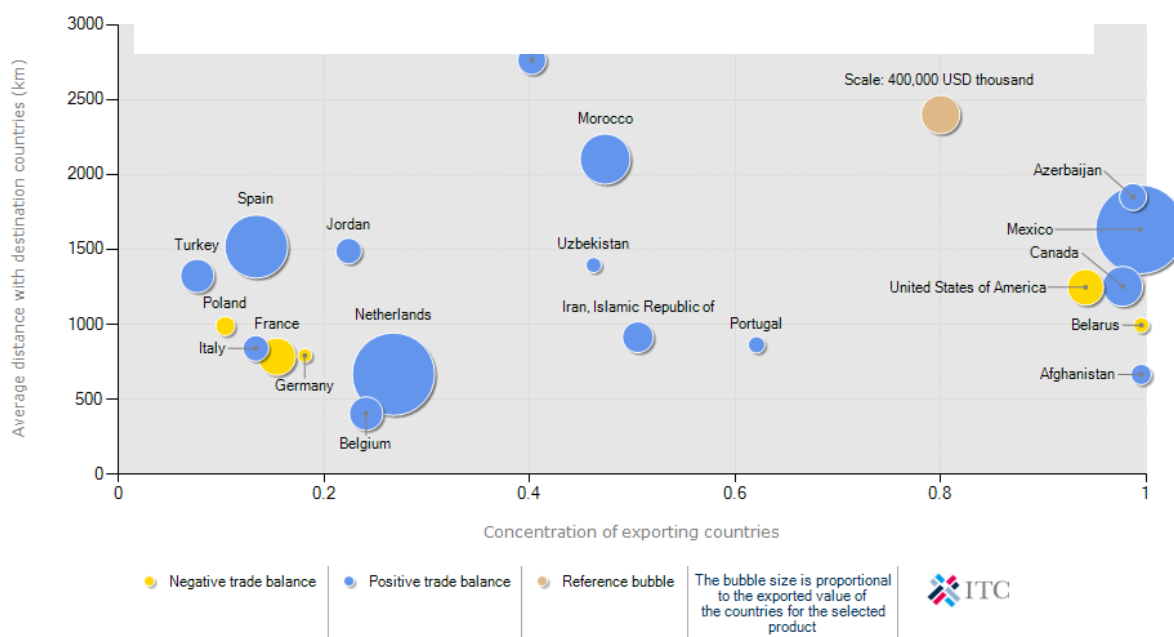
**Imports of fresh tomatoes in selected countries near Tunisia
(metric tons)**



Source: ITC, Trade Map website, 2019

Figure 19

Concentration of countries exporting fresh tomatoes (2018) and distance from country of destination



Source: ITC, Trade Map website, 2019

In 2018, the United States and Germany accounted for more than 41 percent of tomato imports worldwide. The mapping of imports changes annually. Among the main importers, the fastest-growing

markets for tomatoes since 2014 were: Romania (up 87%), Spain (up 54.8%), Netherlands (up 21.1%) and United States (up 21%). Those countries that posted declines in their imported tomatoes purchases were led by: Russia (down -39.7%)³⁶, Sweden (down -8.7%), Belarus (down -8.1%) and Czech Republic (down -3.6%).

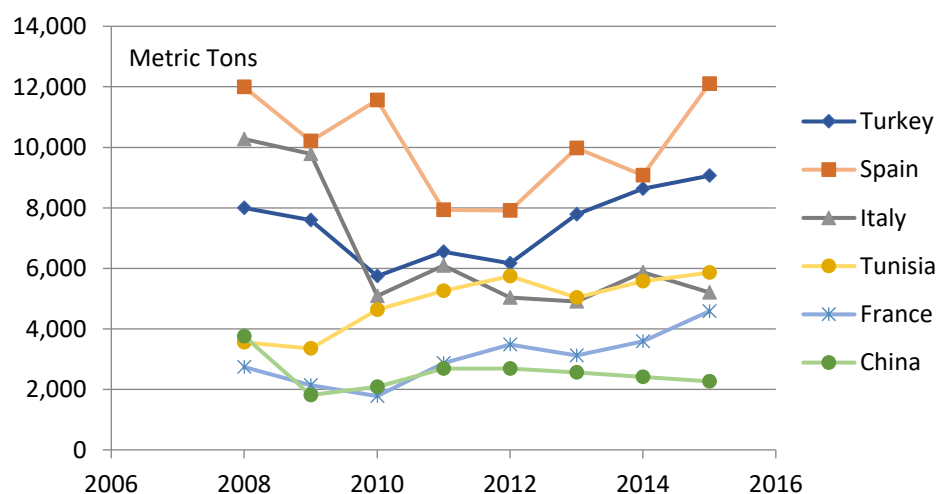
Dried Tomatoes

Part of seasonal tomato production is dried either in the sun or industrially in suitable ovens. The product is dried to a greater or lesser extent depending on demand and requires storage at 4°C, in oil if the water content is high.

The world market for dried tomatoes is quite stable, with an increase of just 1 percent in 2015.³⁷ Dried tomatoes can stay fresh for varying lengths of time depending on their water content, which makes it possible to target distant markets. The main importing countries are the United States and Japan. In 2015, Tunisia's share in the market was 1 percent.³⁸ Almost 99% of Tunisian production is exported to EU. The main exporting countries to EU are, in order, Spain, Turkey, Italy, and Tunisia, a trade valued at US\$11 million in 2015, having grown 65 percent between 2008 and 2015 (figure 20).³⁹

Figure 20

Export of dried tomatoes to EU-28 countries



Source: EU Trade Helpdesk

The main destinations for Tunisian dried tomatoes are Italy (84.0 percent), France (7.2 percent), Germany (5 percent), and Canada (1 percent).⁴⁰ Italy, a producer of dried tomatoes, enjoys a prominence linked to Italian cuisine and benefits from the import of dried tomatoes in bulk from various

³⁶ Although quantities of fresh tomatoes imported by Russia have decreased, some countries have benefited from access to the Russian market. Kazakhstan, for example, increased exported value to Russia by 353% between 2013 and 2017 (ITC Trade Map website, 2018).

³⁷ ITC Trade Map website, 2016.

³⁸ European Union [TradeHelpdesk \(formerly Export Helpdesk\)](https://tradehelpdesk.europa.eu), tradehelpdesk.europa.eu.

³⁹ European Union [TradeHelpdesk \(formerly Export Helpdesk\)](https://tradehelpdesk.europa.eu), tradehelpdesk.europa.eu.

⁴⁰ ITC, Trade Map website, 2016.

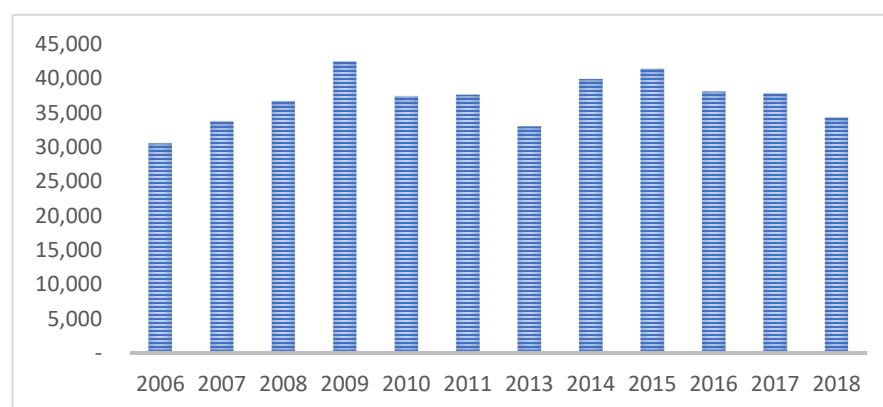
locations to add value by combining dried tomatoes with oil and herbs or to make sauces and present them in attractive packaging to meet the demand.

Processed Tomatoes

Production of processed tomato products has increased by an annual average of 3 percent over the past two decades, from 25 million metric tons in 1995 to 41 million metric tons in 2015. After 2009, production declined for a few years. In 2014 and 2015 it increased again, then production decreased by 8 percent in 2016. In 2018 production reached 34,3 million metric tons. Consumption during this period was in line with production, except in some years when there was overproduction, as in 2009 (Figure 21).

Figure 21

**Evolution of world production of processed tomatoes, 2006–18
(thousand metric tons)**



Source: WPTC (World Processing Tomato Council), Tomato News website, 2019

Although many countries have a tomato processing industry, world production is highly concentrated and the 10 largest producing countries account for some 83 percent of the world's annual production. The largest production is in California (United States), which in 2018 transformed 11 million metric tons. Italy and China follow with about 4.6 and 3.8 million metric tons in 2018. These three locations alone account for more than 57 percent of the total world volume (Table 7).

Table 7**Top 10 tomato processing countries**

(Thousand metric tons)

Country	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
California	10,720	12,073	11,155	11,067	11,464	11,020	12,707	13,018	11,470	9,492	11,065
Italy	4,900	5,747	5,080	4,950	4,500	4,080	4,914	5,393	5,180	5,200	4,650
China	6,405	10,700	7,500	6,792	3,230	3,850	6,300	5,600	5,150	6,200	3,800
Spain	1,730	2,700	2,350	1,985	1,935	1,650	2,700	3,028	2,950	3,350	2,800
Brazil	1,200	1,150	1,796	1,590	1,294	1,670	1,400	1,300	1,450	1,450	1,400
Turkey	2,700	1,800	1,280	1,940	1,750	2,150	1,800	2,700	2,100	1,900	1,300
Chile	510	619	864	794	668	682	810	850	800	1,080	1,211
Portugal	998	1,242	1,280	1,065	1,190	997	1,197	1,660	1,507	1,554	1,198
Ukraine	100	340	280	440	385	330	470	550	550	650	735
Tunisia	800	750	850	868	840	618	720	920	650	643	638
Greece	670	810	640	324	390	425	470	500	440	400	320
Iran	2,060	2,400	1,400	1,850	1,750	1,900	2,200	1,350	1,150	980	300

S/Total Top 10	32,183	39,372	33,555	32,901	28,621	28,617	34,748	35,819	32,407	31,849	28,362
Top 10 vs Global	88%	88%	87%	87%	86%	86%	87%	87%	85%	84%	83%
other	4,486	5,140	5,192	4,733	4,798	4,580	5,148	5,555	5,665	5,948	5,966
Global processing	36,669	44,512	38,747	37,634	33,419	33,197	39,896	41,374	38,072	37,797	34,328

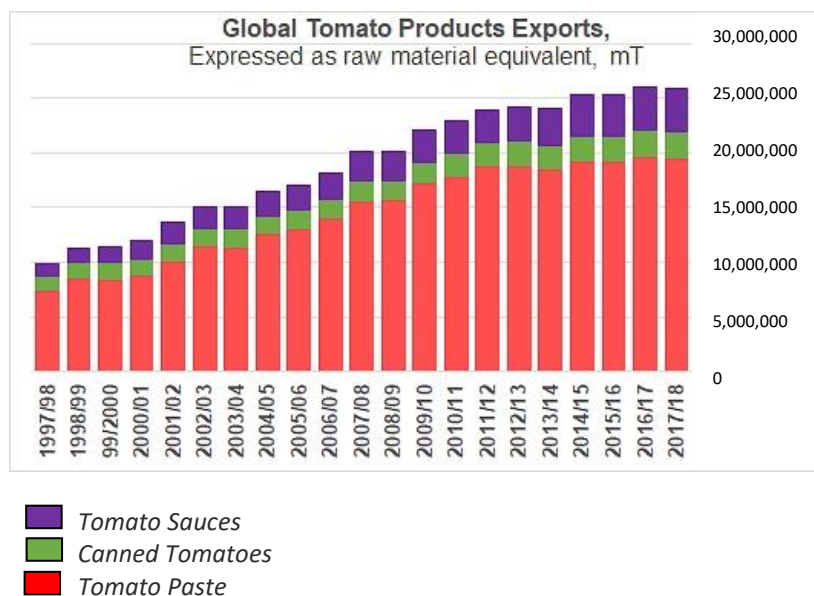
Source: WPTC, Tomato News website (http://www.tomatonews.com/en/background_47.html)

Note: California represents tomato processing in the United States. Only bold numbers in country listing represent top 10 values. Ranking by 2018 values.

Over the past two decades, the volumes of tomato products exported by the world's main industrial tomato processing regions have more than doubled. In addition to domestic processing activities, which are often insufficient to cover local requirements, consumption needs have increasingly and generally been met by products manufactured on the processing lines of national industries with a global reach like Italy, California, China, Spain, Portugal and Chile. From less than 10 million metric tons (mT) in farm weight equivalent in 1997/1998, the volumes shipped abroad have increased almost regularly at an annual rate of 4.9% over the past twenty marketing years, which is a faster rate than the growth of volumes processed around the world, to the point of exceeding 26 million mT in 2016/2017 before dropping back slightly in 2017/2018 to just below that level. This result is part of a wider set of dynamics that indicates a slower growth rate for worldwide consumption in recent years (Figure 22).⁴¹

⁴¹ In 2009, an overproduction of tomato derivatives, mainly DCT, led to the creation of a global stock of products. This stock contributed to the decrease in processed volumes in the following years when demand exceeded production. Stocks built in 2009 continue to feed the tomato derivatives market at the moment and slow down the development of production. This scenario has been repeated on a regular basis approximately every five years during the past 30 years.

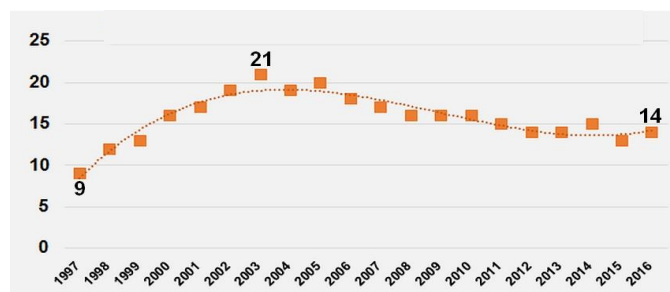
Figure 22
Global export of tomato products



Source: http://www.tomatonews.com/en/trade_46.html

In 2016, only 14 countries reported an active trade balance for the “tomato products” sector. The market's continuous expansion model that resulted in the increase of processed quantities in the main exporting countries over the past twenty years no longer seems to be applicable. Growth strategies for industries and companies, particularly in the paste sector, can be considered at best as stagnating in the global context. This situation, which aggravates competition because growth can only be pursued by taking over pre-existing market shares at the expense of other industrial operators, does seem to be what has determined the context of worldwide industry operations for the past five or six years⁴². Processing capacities and the revenue generated by worldwide trade of processed tomato have become more and more concentrated (Figure 23).

Figure 23
Number of countries with a positive trade balance for tomato products



Source: www.tomatonews.com

⁴² http://www.tomatonews.com/en/trade_46.html

Among the three main product categories, exports of sauces seem to have done better than other categories at resisting the slowdown in dynamics. The development of global exports for this kind of product has been practically linear over the past 20 years, at an average annual rate of close on 5.8%. In 2017/2018, the worldwide trade for sauces shifted 1.38 million mT of finished products (up by 1.8% against the average (1.35 million mT) of the three previous marketing years (2014/2015, 2015/2016 and 2016/2017)), which is the processed equivalent of slightly more than 4.0 million tons of raw tomato. The growth of the ketchup and sauces category took the products to approximately 15 percent of worldwide trade over the past three years, against 12 percent at the end of the 1990s. The canned tomato sector, which accounted for 12 percent of worldwide trade in 1998, accounted for only slightly more than 8 percent of volume in recent years.

In 2017/2018, like in 2016/2017, the 15 main paste exporting countries accounted for 97% of the sector's global trade (3.22 million mT). Almost half (1.55 million mT, or 48%) of the volumes exported in 2017/2018 involved products originating in China or Italy. This proportion climbs to 79% of all worldwide trade when it includes the volumes shipped from Spain, the USA and Portugal (991 000 mT).

Table 8

Global trade of tomato paste from the 15 main exporting countries to the 17 importing regions (2017/2018)

to // from	China	Italy	Spain	USA	Portugal	Turkey	Iran	Chile	Ukraine	Greece	Netherl.	France	Poland	Germany	Hungary'	Total
Western EU	59,067	436,216	289,402	63,313	189,031	19,098	145	6,112	8,198	23,883	21,595	11,392	7,954	10,478	3,937	1,149,821
Middle East	103,983	10,174	12,445	14,517	11,835	122,907	82,423	10,649	4,861	978	13	6	9	7	0	374,807
WestAfrica	333,444	27,427	249	5,535	659	141	269	0	0	8	15	37	0	4	0	367,788
Far East	111,238	12,096	22,940	55,014	31,651	7,192	4	19,572	2,563	79	155	39	0	30	0	262,573
EurAsia	99,875	10,355	5,509	3,489	7,789	4,673	45,817	4,713	3,374	273	23	100	745	234	30	186,999
Eastern EU	20,534	54,476	25,789	228	14,499	396	0	274	28,676	650	4,207	2,175	6,622	3,763	7,775	179,064
CentrAmer	15,687	2,715	2,131	111,438	0	68	0	29,733	1	0	1	42	16	89	0	161,921
MediterrAfrica	40,668	17,212	6,728	8,694	379	371	0		3,283	117	0	0	0	1	0	77,453
SouthAfrica	49,778	15,079	895	505	2,512	64	2	0	0	874	4	19	0	8	0	69,740
South America	8,506	7,260	491	9,166	143	0		43,115	0	0	0	0	0	15	0	68,696
NorthAmer	2405	18,241	1,085	42,693	36	2,144	223	422	14	179	10	131	90	15	0	67,688
Austr NZeal	10,524	19,639	175	19,550	4,266	1,358	166	308	0	7	0	149	0	0	18	56,160
Europe Non-EU	3,947	23,994	5,380	4,168	3,637	480	22	0	1,530	917	74	619	8	1,119	1,006	46,901
EastAfrica	18,275	5,267	311	0	1,098	201	21			14		0		0		25,187
Indian Penins.	13,183	363	31	4,510	18	144	946	0	1,621	0	0	9		0	0	20,825
China	514	506	39	7,266	10	8		21	2	0	3	7	27	5		8,409
other	100	25	0	124	0	88	3	0	0	0	18	0	1	16		375
Total	891,728	661,045	373,600	350,210	267,563	159,333	130,041	114,919	54,123	36,979	26,118	14,725	15,472	15,784	12,767	3,124,4071
Share of Total Exports	27.7%	20.5%	11.6%	10.9%	8.3%	4.9%	4.0%	3.6%	1.7%	1.1%	0.8%	0.5%	0.5%	0.5%	0.4%	

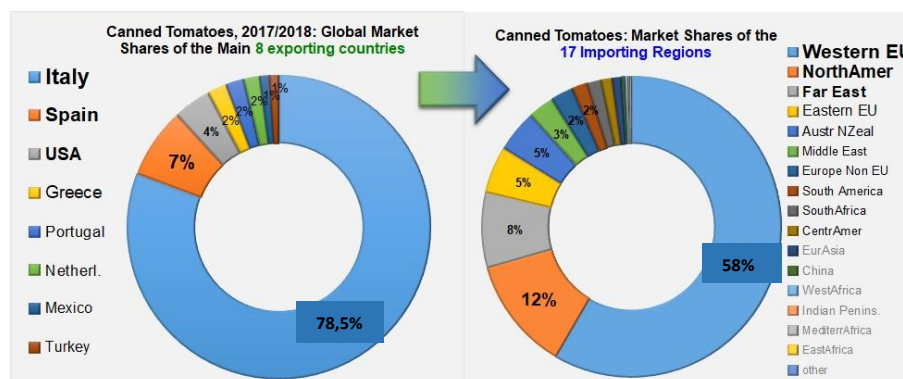
Source: http://www.tomatonews.com/en/trade_46.html

Note: To facilitate the analysis, the author divided EU into Western EU (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom) and Eastern EU (countries that became member of the EU after May 1, 2004).

With 1.366 million mT exported over this past marketing year, Italy accounted in 2017/2018 for more than 78% of the world's trade in canned tomatoes (1.74 million mT). The extreme polarization of the worldwide trade in canned tomatoes, which has been the main feature of this segment for many years, does not seem likely to change in the foreseeable future. Particularly for the operators in the South Central region of Italy, who are the undisputed leaders of the sector, the 2017/2018 marketing year provided the opportunity to consolidate their hold on the global market for canned tomatoes, recovering some of the market shares that they lost in previous years (Figure 24).

Figure 24

Global trade of canned tomatoes: market shares (2017/2018)

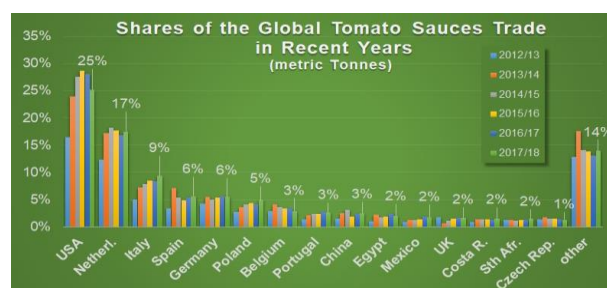


Source: http://www.tomatonews.com/en/trade_46.html

With more than 347 700 mT exported, the United States accounted for one quarter of total foreign sales of tomato sauces & ketchup in 2017/2018. The USA are followed by the Netherlands in terms of foreign trade, with Dutch exports nonetheless accounting for close on 241 000 mT and 17.5% of total shipments for the year. With the addition of the volumes exported by the Italian industry (129 000 mT of finished products), more than 52% of the world's exports of sauces & ketchup were recorded by just three countries. Contrary to the extreme polarization that characterizes the world's canned tomato category, the global market of tomato sauces & ketchup remains a competitive sector where many supplier countries take part. In 2017/2018, the fifteen main exporting countries only accounted for 86% of the total offer. Slightly more than 1.378 million mT of finished products were shipped last year, of which 1.186 million mT were sold by one of the leading countries of the category. Over the latest marketing year of 2017/2018, the US industry is the only one with a global reach that recorded a net decrease in its worldwide market share, while processors in the Netherlands, Italy, Spain, Germany, Poland and Portugal managed to extend their outlets.

Figure 25

Shares of the global trade of tomato sauces, 2012–18 (Percentage)

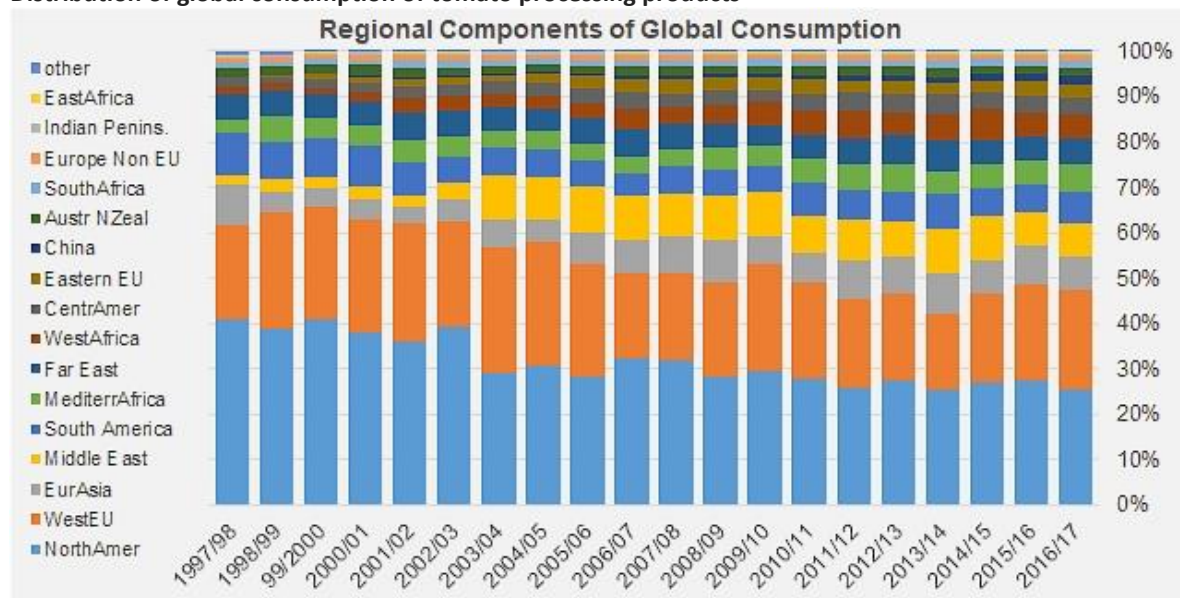


Source: http://www.tomatonews.com/en/trade_46.html

The importance of the tomato producing industry is also rooted in the regular growth in consumption observed over the past twenty years. Mainly a trait of nations with a high standard of living, the highest overall consumptions of tomato products are found in Europe, Pacific-Asia region and in the USA, with 20 up to 28 kg per year. Results from other countries (Canada, Japan, Tunisia, etc.) confirm the importance of the role played by tomato products in the eating habits of a wide variety of countries. Throughout these areas, the increase in tomato consumption has been steady for several years, albeit at different rates. This has led to the appearance of new tomato-producing countries on the market. Some of them, like China, have dedicated heavy capital investment to this branch of the food industry. In only a few years, they have become able to threaten the dominant position of the two main producers, the USA and Italy (Figure 26).

Figure 26

Distribution of global consumption of tomato processing products



Source: Branthôme, *Components and Patterns of Regional Consumption*, Tomato News, 2018

3.3 NATIONAL OVERVIEW

In 2017, Tunisia was the 16th largest producer of tomatoes in the world (with 1.29 million metric tons of production) and second in the Middle East and North Africa region, after Egypt (7.29 million metric tons) and just before Morocco (1.29 million tons) and Algeria (1.28 million tons) and. Production was 78 percent in summer and 22 percent out of season. The portion destined for processing (open field, in summer) and consumption in fresh (out of season) was 960,000 and 290,000 metric tons, respectively⁴³.

Table 9

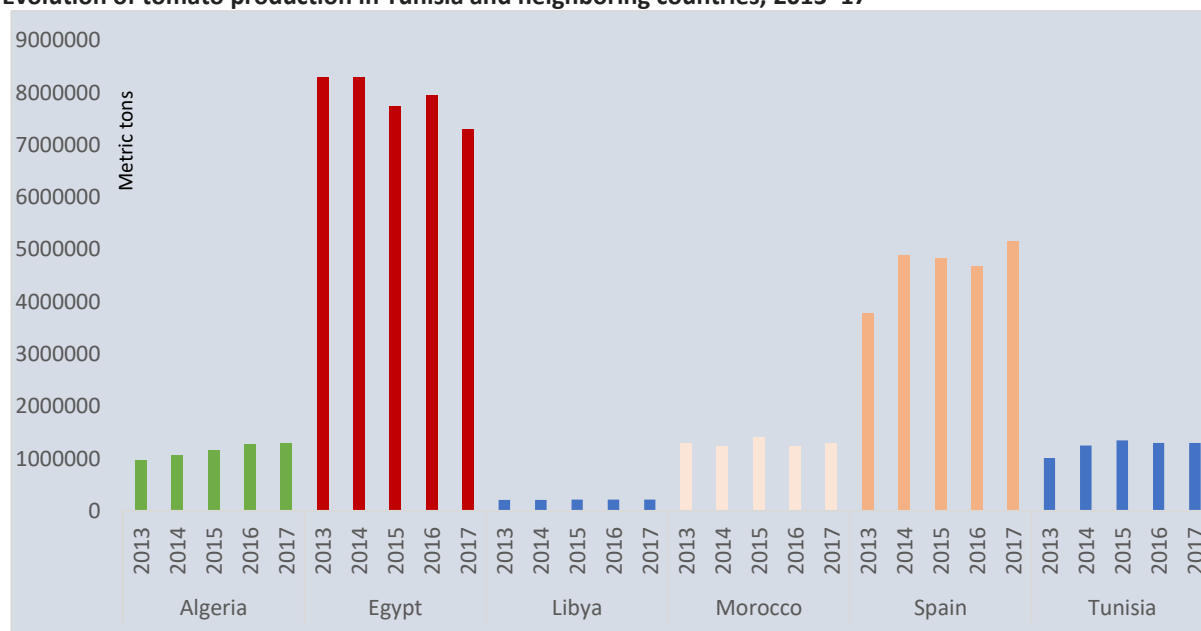
**Tunisia Tomato Production, 2012–17
(Metric Tons)**

Year	Value
2012	1,357,000
2013	1,013,000
2014	1,288,000
2015	1,600,000
2016	1,333,000
2017	1,298,000

Source: FAOSTAT database, 2019

Figure 27

Evolution of tomato production in Tunisia and neighboring countries, 2013–17



Source : FAOSTAT database, 2019

⁴³ GIL (groupement interprofessionnel des légumes(G.I.L), 2016.

Tomato is the second most important commodity produced in terms of quantity by the country and it is grown annually on an area of around 28,000 ha. Yet, with an average yield of 58 metric tons per hectare, productivity is very low compared with countries such as Morocco (80 metric tons per hectare) or Spain (86 metric tons per hectare).⁴⁴ The processing of tomato into Double Concentrated Tomato (DCT) is a main Agri industrial activity that is increasing to meet a rising demand currently estimated at 100,000 tons. The DCT product is intended primarily for local consumption and secondly for export mainly to Libya. In Tunisia the number of tomato farmers is hard to estimate but there are about 10,000 tomato farmers related to processing⁴⁵. Most farms are less than 2 ha, hence mechanization is not in place. The activity in Tunisia is mainly carried out in open fields, whereas in neighboring countries crops are increasingly grown in greenhouses, which provide very high yields and enable the cultivation of tomatoes outside the usual growing season.

Fresh Produce

For decades, fresh tomatoes have been on the Tunisian market throughout the year without being exported. Greenhouses enable fresh tomato production in regions with the necessary climate: the coastline and regions such as Sidi Bouzid and Kasserine. Typically, farmers produce off season tomatoes for the local market. Until recently, however, there has been no production of fresh tomatoes for off season exports. Fresh tomatoes for export are mainly produced in greenhouses of large farmer companies. Export of fresh tomatoes increased from 2,481 metric tons in 2001 to almost 13,000 metric tons in 2016 but still represents less than 2 percent of total tomato production. Since most export is to the EU (between 80-85% in weight) these large companies are certified (GlobalGAP). France, the Netherlands and Germany cover already around 75% of the tomato fresh export.

Table 10
Export of fresh tomatoes from Tunisia

Importers	Value exported in 2017 (USD thousand)	Quantity exported in 2017 (Tons)	Growth in exported value between 2013-2017 (% p.a.)	Growth in exported quantity between 2013-2017 (% p.a.)
Total	31,215	12,725	20	3
France	11,383	4,128	8	-14
Germany	9,023	2,577	87	69
Netherlands	6,812	3,982	43	41
Russian Federation	2,774	1,266	81	63
Italy	591	357	-32	-32
Kuwait	177	254	-1	34
Saudi Arabia	163	62	0	0
Finland	79	23	302	181
Poland	49	17	-32	-39
Canada	44	13	0	0

Source: ITC, Trade Map website, 2019

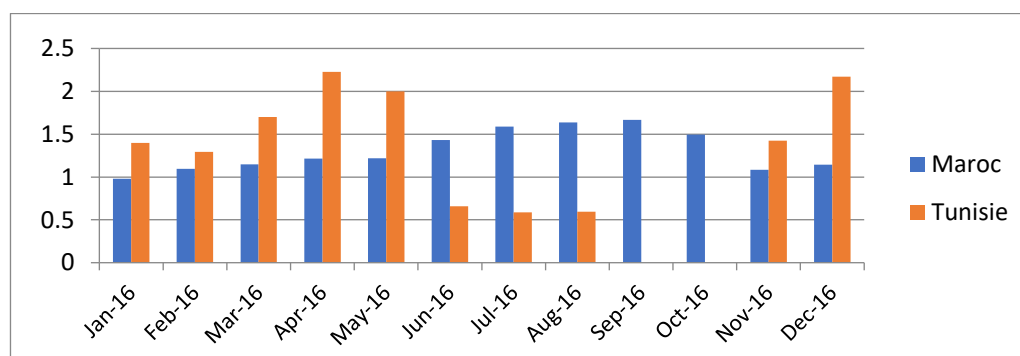
⁴⁴ FAOSTAT database.

⁴⁵ H. Soethoudt, Blom-Zandstra, G., H. Axmann, 2018. Tomato Value Chain in Tunisia, Business opportunities. Wageningen Research, Report WFBR-1830 ISBN: 978-94-6343-295-5

However, Tunisian tomatoes represent only 2 percent of fresh tomatoes imported by EU countries. The growth rate of imports is low, and market access is regulated by an agreement that limits trade to the off season (between October 1 and May 31),⁴⁶ when prices are higher (figure 28).

Figure 28

Evolution of prices of fresh tomatoes exported to the EU
(Euro/kg)



Source: UN Comtrade database, 2017

Tunisian fresh tomatoes represent only 0.3 percent of world exports. In the Mediterranean area, Morocco is at the forefront, followed by Spain (Table 9).⁴⁷

Table 11

Evolution of the export of fresh tomatoes, by value

	2012–16 (%)	2015–16 (%)	Share of world export (%)
Morocco	5	2	17.0
Spain	-4	0	12.2
Turkey	-10	-34	2.7
Egypt, Arab Rep.	20	-9	0.8
Netherlands	-1	-4	20.0
Tunisia	3	34	0.3

Source: ITC, Trade Map website, 2019

Processed produce

Tunisia uses around 75 percent of its seasonal tomato production for processing while the worldwide average is at 30 percent (DGPA 2016). The high internal demand for processed tomatoes involves that between 650 and 950 kton of fresh tomatoes are processed annually into double and triple tomato paste and other canned tomatoes. Most cases tomatoes end up as Double Concentrate Tomato (DCT). In 2013 about 92% of the

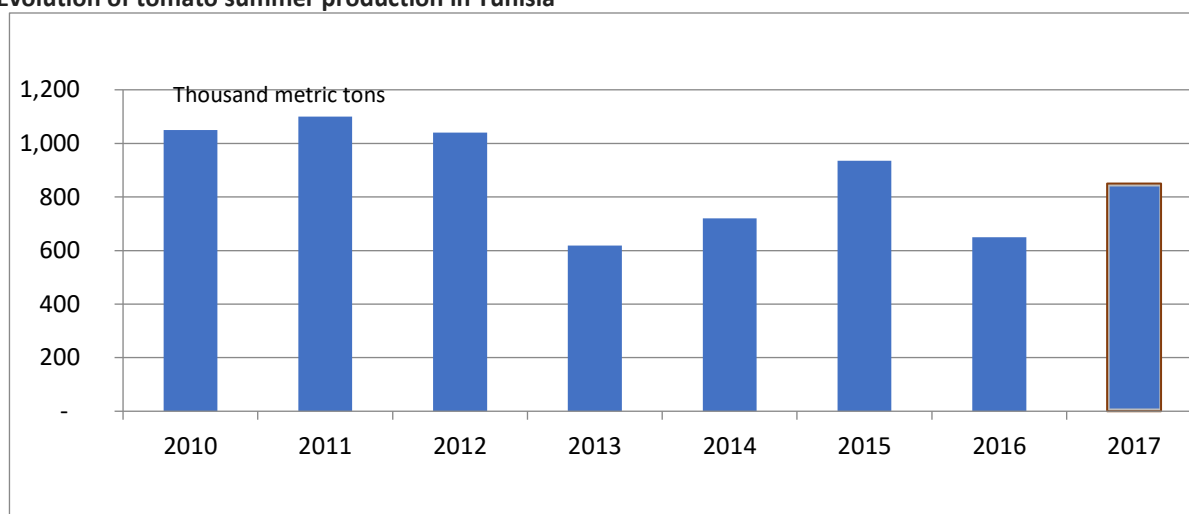
⁴⁶ Tomatoes are part of fresh legumes exempted in the period October 1 to May 31.

⁴⁷ For a total comparable tomato production of 1.2 million metric tons per year, Morocco exports a value of US\$440 million (fresh, DCT, and dried), while Tunisia exports a value of \$39 million (fresh, DCT, and dried). More information is provided in box 9, "The Case of Morocco."

processed tomatoes became DCT, 7.3% dried tomatoes and 0.7% the rest like cubed and peeled tomatoes. The conversion factor from fresh to DCT in 2013 was 6,4 kg fresh for 1 kg of DCT⁴⁸. In DCT production, some of the water contained in tomatoes is removed and the resulting paste is stabilized to provide it with a shelf life of three years. The DCT product is traditionally intended primarily for local consumption and secondly for export, mainly towards the Libyan market. Tunisia's consumption of DCT is the equivalent of 54 Kg/capita/year of fresh tomatoes (Observatoire National de l'Agriculture, 2015).

Figure 29

Evolution of tomato summer production in Tunisia



Source: DGPA, GICA website

The trade volume in DCT from Tunisia has fallen during the past decade (by 60 percent), and more drastically since 2010 (75 percent). Tunisia's traditional DCT export markets, Libya and Algeria, have reduced their imports from Tunisia. In recent years, access to the Libyan market has been difficult due to its internal conflicts and fragility; Algeria, after the establishment of production units, imports DCT in bulk mainly from China to package it in individual units. Consequently, in July 2016, Tunisia recorded an excess of stock of 32,000 metric tons of DCT.

Table 12

**Export of DCT from Tunisia
(Tons)**

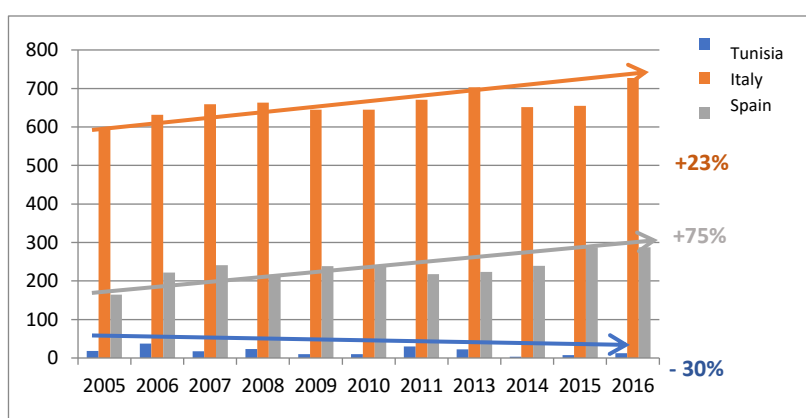
DCT export	2013	2014	2015	2016	2016 (%)
Libya	16,681	1,425	5,557	11,282	88%
France	359	296	456	639	5%
Algeria	1,093	58	67	104	1%
Other	4,393	1,175	1,242	829	6%
Total	22,525	2,955	7,322	12,853	100%

Source: UN Comtrade database, 2018

⁴⁸ <http://www.sicam-tunisia.com/>

With strong competition from Italy and Spain and the decline in DCT prices on the international market due to the entry of China as a producer, the tomato processing sector is struggling in Tunisia (Figure 30). As an alternative, Tunisia could tap into alternative new markets, for example in Africa or the Middle East, where per capita consumption is growing.

Figure 30
Evolution of DCT exports in Tunisia and neighboring countries
(thousand metric tons)



Source: UN Comtrade database, 2017

Tunisia processes less than 7 percent of its total seasonal production in dried tomatoes. On average, tomato production uses on 800 hectares of land, mainly by small farmers who work for Italian importers (60 percent of production) (GICA⁴⁹ 2010). In 2011, processed quantities reached 50,000 metric tons of tomatoes, with an increase of 10 percent since 2009.

In 2015, Tunisia exported 4,096 metric tons in bulk worth US\$10.969 million and an average price of US\$2.68 per kilogram, mainly to Italy (GICA). Tomatoes are dried manually. Cut tomatoes are placed on plastic nets and packed in boxes, although some Italian importers prefer to select them in Italy, so they are packed in bins or in plastic crates.

The value addition for Tunisian dried tomatoes is carried out in Italy with sophisticated packaging and sometimes the addition of olive oil. However, value addition should be possible in Tunisia if it can comply with good hygiene practices, complete traceability (ISO 22000 certification), and international standards (UNECE DDP 19/Edition Geneva 2007).

3.4 CLUSTER ANALYSIS

The districts of Kairouan and Sidi Bouzid account for almost 30 percent of Tunisian tomato production. The region is home to 33 percent of the processing capacity of tomatoes—four canning plants—DCT and dried tomatoes (GICA 2010) (Figure 31). The area devoted to seasonal tomatoes is 4,500 hectares (around 16% share of the overall area devoted in Tunisia), with yields well above the Tunisian average: between 70 and 75 metric tons per hectare that resulted in 190,000 metric tons of tomatoes in Kairouan

⁴⁹ Groupement des Industries de Conserves Alimentaires, or "canned food industries group".

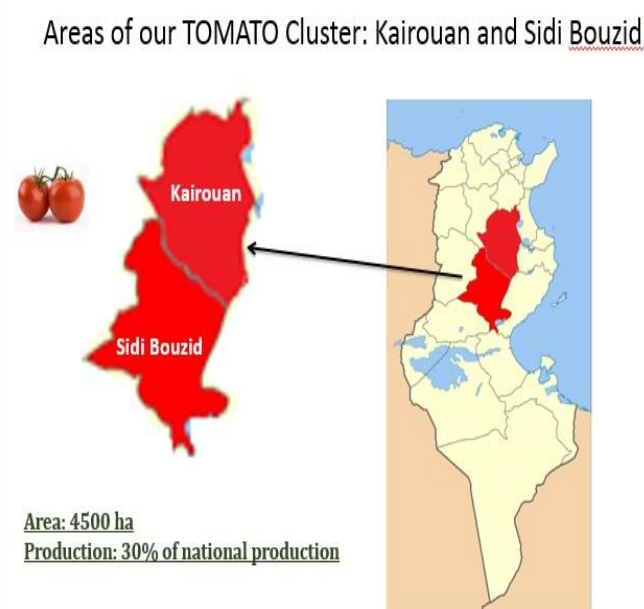
and 185,000 in Sidi Bouzid in 2016. This activity employs 70 to 80 men per day per hectare between the end of February and the end of July. However, these areas are decreasing because of the declining exports of DCT to Libya and Algeria.

Figure 31

Main features of the cluster

	Kairouan	Sidi Bouzid
Cultivable soil(ha)	387 929	446 100
Irrigated land(ha)	58 100	51 970
Seasonal tomatoes cultivated area (ha)	2 740	2 500
Density (plant/ha)	33 000	33 000
Yield (t/ha)	70	75
Production (t)	190 000	185 000
Plantation-Harvest period	End of February-July	End of February-July
Number of farm workers/ha during the whole period outside the tomato harvest	70-80 man-days/ha	70-80 man-days/ha

Source: Value Chain Development Training Program



In 2014, the area devoted to off-season cultivation accounted for almost 26 percent of the total area. In the cluster, more than 3,000 farmers live from the production of tomatoes. The area of Sidi Bouzid produces late tomatoes in open fields, between September and November. It also produces tomatoes between December and May in cold greenhouses. In the governorate of Kairouan, off/season production uses heated greenhouses. These greenhouses could alternatively, for ecological reasons, switch to solar energy. Some dried tomato companies exist in the region, but the sector remains largely unorganized. Retail companies group products from small producers for export. An exception is represented by a major solar drying unit that employs 500 people, 200 of whom are permanently employed, and produces 600 metric tons of dried tomatoes, 90 percent of which are exported to Italy.⁵⁰

3.5 STRATEGIC MARKET SEGMENTATION

To explore the best alignment between market trends and local production, trainees focused on the following products for the strategic market segmentation⁵¹:

- **Processed DCT tomatoes.** The segment of concentrated and similar derivatives has low attractiveness because of an abundant supply (China, California, and Italy provide 60 percent of total production), numerous strong competitors, and strong competition of substitute

⁵⁰ Elaboration of trainees based on data from the Ministry of Agriculture, Water Resources, and Fisheries, DGPA, Tunisia.

⁵¹ See annex A for a synthesis of the methodology adopted by trainees during the segmentation exercise.

products such as white sauces and ketchup. Profit margin is essentially determined by the volume. Intermediaries and distributors hold market information and account for the largest portion of the margin, while suppliers (such as Tunisian producers) have low bargaining power.

- **Fresh tomato for ordinary (local) consumers.** The segment is easy to gain access to because there is no need for big investments and the use of sophisticated techniques. There is a variety of substitute products (including other fresh fruit, cucumbers, and salad) and high competition. Bargaining power for suppliers is low and the power of negotiation is in the hands of clients who look for regular supply. The segment is slightly more attractive than the previous one.
- **Tomato juice, flash pasteurized, for demanding consumers.** The segment concerns a minimally transformed product, 15 seconds for pasteurization, but the product cannot be conserved for a long time, requires cold storage, and needs high quality control during the entire value chain. Tomato juice is a ready-to-eat product with guaranteed nutritional quality. The main barriers to entry are the need for quality, packaging, and logistics. There are few substitute products and competition is low. Suppliers have low bargaining power but not as low as in other segments, and clients looking for a steady supply and quality have more power. In conclusion, this segment is more attractive than the “transformed tomatoes” because those who select, pasteurize, and pack fruit juices enjoy superior negotiating power.
- **Off-season fresh tomato for demanding consumers (mainly exports).** In this segment, consumers and buyers are more demanding in terms of quality, freshness, and the flavor of the fruits. A differentiated and more complex production process requires more selection and upstream research, quality control, and very efficient logistics. It seems to be the most attractive segment because producers that can meet the demand for quality and freshness (maximum delay of 72 hours to market) have more price margin and bargaining power. In addition, there are high entry barriers with few substitutes and competition is lower than in the previous segments. Finally, the segment is growing because consumers increasingly demand healthy products with high nutritional value and abundance of antioxidants.

In view of the above analysis of the various segments, the team focused on off-season fresh tomato for demanding consumers.

The SWOT (strengths, weaknesses, opportunities, and threats) analysis of the Kairouan and Sidi Bouzid cluster helped in identifying niches and market segments in which producers that form the cluster have higher competitive advantages that would enable them to benefit from higher revenues and value creation. SWOT analysis reveals the following features:

Strengths

- Developed institutional framework, on the national level (GICA, GIL)
- Available irrigated land: 58,100 hectares in Kairouan; 51,970 hectares in Sidi Bouzid
- Out-of-season tomato production: late, under shelter already exists in Sidi Bouzid; late tomato cultivation in open fields (harvest: September to November)
- European market (proximity is less than 72 hours for shipment)
- Exemption of customs duties between November and April to the EU for fresh tomatoes*
- Developed know-how in the production of sun-dried tomatoes

**Between November 15 and April 30 (off season, when greenhouses are in production) there is a period of exemption from customs duties to the EU for fresh tomatoes (<https://eur-lex.europa.eu/legal-content>)*

Weaknesses

- Currently, 92 percent of tomato production is transformed into DCT; and the main export destination (> 85 percent) of DCT is Libya.
- Lack of logistics and cold chain for supply and distribution of perishable exports
- Lack of fresh tomato packaging units with cold storage
- Absence of applied research for the identification of old and new varieties to respond to consumer trends

Opportunities

- Strong global growth in fresh tomato markets
- Growth in demand for specific varieties of tomatoes (cherries, bunches, yellow)
- The demand for sauces and ketchup is growing for organic, traditional products
- The heating of the “off-season” tomato in greenhouses in Kairouan due to abundant annual sun exposure

Threats

- Competition from China, Spain, and Italy to produce dried tomatoes
- Competition from Morocco and Senegal in the European market for fresh off-season tomatoes
- Strong demand for water resources to produce fresh tomatoes (production needs to substitute less profitable production).
- Strong pressure on the availability of land in the irrigated perimeters of the region;

3.6 OPPORTUNITIES IN OFF-SEASON FRESH TOMATO FOR DEMANDING CONSUMERS

Success in penetrating this segment in the international market depends on meeting precise and very different consumption needs. To meet consumers’ needs, tomatoes should have specific features such as flavor, freshness (product from harvest to customers in no more than 72 hours), color, shape and gauge (bright and uniform, without stains or signs of incomplete ripeness), homogeneity and symmetry, robustness of the skin. In addition, tomatoes should be stored in flexible and differentiated packaging that communicates the freshness and superior quality of the tomatoes. Finally, fresh tomatoes must be shipped through refrigerated transport after harvesting.

Improved cultivation techniques; information to farmers on the seed varieties requested by specific markets and product characteristics; as well as the establishment of appropriate collection, storage, and transport logistics would help increasing export of fresh Tunisian tomatoes to the most attractive markets. Even if the distribution of imports annually changes, Germany, Russia and the Middle East can be considered the most promising markets for Tunisian fresh tomatoes (see also figure 18).

The current lack of a national policy to support production of fresh tomato for export could be addressed through the adoption of export-oriented policies, such as the one illustrated in the following Box.

BOX 9: THE CASE OF MOROCCO

Starting in the 1990s, Morocco's tomato production became more export-oriented. The country thereby increasingly replaced field tomato crops, which occupied more than 70 percent of the production area, with off-season crops, intensified greenhouses, and used more fertilizers. The recent growth has been accelerated by a number of incentives and segment-specific programmes initiated under the Green Morocco Plan (Plan Maroc Vert), notably the contract programme targeting the development of farm crops (fruit and vegetables). This state-supported conversion resulted in 803,000 metric tons of tomatoes destined for fresh consumption. Exported quantity increased from 206,000 metric tons exported in 2001 to 568,000 metric tons exported in 2018. Worldwide, Morocco is currently the fourth largest exporter of fresh tomatoes, holding 7.2 percent of global fresh tomato exports in 2018.

For comparison, Tunisia exports only 14,569 metric tons, holding 0.4 percent of world exports. The various agricultural policies carried out in Morocco have established several production/export structures to support tomatoes in Morocco. In Tunisia, very few actors exist in that space (the most prominent being Sanlucar and Desert Joy).

Morocco's export oriented policy dramatically improved fresh tomato production and its ranking in terms of export, with some positive effects for the entire region and a potential overall increase of the market. Anyway, it is important to consider also the potential negative impacts of the mobilization or conversion of agricultural land for export production. Specifically, it is necessary to consider not only the sustainability of the resources, but also the effects of decreased domestic supply on the national demand, given low purchasing power. A balance is possible when looking at the entire spectrum of the production: a proactive policy could encourage the substitution of higher volumes of water-inefficient and low-value-adding production for lower volumes of water-efficient and high-value-added production. In addition, the current trend of consumption of organic products could lead to a more environmentally friendly variety of this agricultural product.

3.7 WHAT IT WOULD TAKE TO SEIZE THIS OPPORTUNITY

The strategic vision aims to better integrate the different stages of the value chain to improve competitiveness. Specific attention must be paid to the quality of the product as well as to its positioning (including packaging and marketing). Strategic recommendations for the fresh tomato for demanding consumer segment were identified at the following levels:

- **Production** of the cluster is currently characterized by nonspecific varieties, heterogeneity in product quality, and the use of pesticides. To be competitive, production should be focused on varieties of tasty and authentic tomatoes. Attention should be paid to workforce skills, good farming practices (compliance with maximum residue limits), and agronomic improvement (off season).
- **Transport of tomatoes** should be refrigerated, constantly controlled, and traced.

- **Post-harvesting** requires control of flavor by tasting, storage under controlled climatic conditions and refrigerated warehouses near the producer. Packaging should be simple but captivating, with a label that guarantees the concept of freshness. Fundamental is also a system of quality control and traceability after production. Currently, the product is packaged in undifferentiated, simple metal boxes. In addition, there are currently no special checks in terms of flavor.
- **Distribution** should be in small batches, with accurate control of the condition of the fruit and logistics under precise climatic conditions. Conversely, current distribution in the cluster is traditional, without any sophisticated logistics.
- **Sales** in the segment are based on clearly differentiated products with well-identified flavors. Key elements are the promotion of the product at the point of sale, top prices, and a distribution network focused on sophisticated customers (delicatessens and luxury restaurants; high-end or specialized healthy-food stores). The cluster's product is currently sold as a basic product, with no possibility of differentiation, low added value, and a noncompetitive price on the international markets.
- **Consumers** of the segment are well informed about taste and freshness of the tomato and incorporate differentiated tomatoes into their usual diet. Today, the customers of Tunisian tomatoes do not have sufficient knowledge about the tomatoes they buy, and thus they cannot be considered loyal consumers.
- **Training** of small farmers on irrigation methods, phytosanitary monitoring, and greenhouse cultivation is needed.

The team highlighted that investments in the supply chain are instrumental to the creation of value in the off-season fresh tomato value chain. Increased investment is needed not only in the agricultural sector, but also in the services sector. Furthermore, investments could benefit the entire region's fruits and vegetables. Recommendations made by participants are organized along the following strategic axes:

- **Juridical and institutional framework.**

The focus should be on the revision and simplification of the procedures for the import of seeds and export of tomatoes, by Groupement Interprofessionnel des Legumes (GIL), Customs, and the Ministry of Agriculture.⁵²

- **Tomato production technologies.**

Incentives should be provided for farmers to make investments in off-season tomato production that would promote production technologies and establish sustainable production systems (heating of greenhouses by solar panels, for example). Participants estimated that the realization of this activity could directly create more than 700 jobs. In addition, another 1,000 jobs could be created along the value chain.

- **Supply logistics**

⁵² Tunisia has a set of specifications for the import of seeds and seedlings, but the problem is the heavy administrative burden between the Agriculture and Trade ministries. In particular, the average wait time for permission for a seed import operation is three months and can go up to six months. After that, there are some post-planting checks done by the Ministry of Agriculture that can involve further delays.

Development of a supply logistics system is needed between farmers and packers, on the one hand, and between packers and operators of intercontinental refrigerated transports, on the other hand. The creation of new enterprises should facilitate new employment. A framework agreement with a distribution platform (new or existing⁵³) could facilitate supply and distribution in the short term.

- **Customized financial products**

Customized financial products, managed by GIL, should be created, including a specific fund for the promotion of off-season tomato production. The fund could provide financial means to acquire solar panels, equip greenhouses, purchase packaging materials, improve packaging of tomatoes, and purchase refrigerated rolling stock.

- **Research program**

A research program should be developed on tomato varieties and capacity building for farmers, technicians, and engineers. Proposed examples included a program between ESA Chott Meriem (agronomical institute specialized in horticulture) and the National Agronomic Institute of Tunisia in collaboration with GIL, Sanlucar Tunisia, and the National Bank of Genes to produce varieties adapted to production conditions and market needs.

- **Promotion**

A strategy must be elaborated to promote and connect the fruit and vegetable distribution platforms in Europe to enable Center West tomatoes to gain access to markets.

Finally, participants of the program recommended to study a potential reconversion of the industries of the processed tomatoes sector. Industrialists can continue their activity but should produce another range of derivatives in response to the current demand for sauces, ketchup, and coulis. Reconversion will require material (such as an autoclave for sterilization and packaging machines to transfer the product into jars) and immaterial investments (training in sterilization, formulation and recipes for new products, quality control, and research development). Reconversion should also be combined with a marketing strategy for tomato sauces, a specific action plan (national market/regional market), and a promotional fund to finance promotional events in target markets. That said, it is important to keep in mind that the competitiveness of derivatives of Chinese (and soon Indian) tomatoes will always impose strong competition to the entry of Tunisian products into new markets. This factor explains the recommendation to target other segments in which Tunisian products have stronger competitive advantages.

⁵³ For example, Sanlucar, a multinational company that produces and commercializes premium fruits and vegetables, which already holds farms in Tunisia, was approached by the team to gauge its interest, and responded positively.

4. HOW TO ENHANCE COMPETITIVENESS AND JOB CREATION FOR VALUE CHAINS OF MEDICINAL AND AROMATIC PLANTS

4.1. MAIN FINDINGS

Medicinal and aromatic plants (MAPs) are botanical raw materials that are used primarily for therapeutic, aromatic, and culinary purposes as components of cosmetics, medicinal products, health foods, and other natural health products. Although detailed data are lacking,⁵⁴ available information indicates that the world market for MAPs continues to grow. Tunisia has a high diversity of plants because of its varied topography, climate, and edaphic conditions. MAPs contribute 0.8 percent to the value of Tunisian agricultural production, 1 percent to exports. Tunisia's exports of aromatic and medicinal plants are estimated at around 9 million US\$. The sector requires about 250,000 working days per year, which corresponds to 0.9 percent of the working days used by the agricultural sector.

In Tunisia, rosemary is the most exploited aromatic and medicinal forest plant, followed by myrtle. Tunisian SME exporters of rosemary products exploit designated aquifers to satisfy their customers' demand in, mainly, bulk essential oil and dried rosemary. The analytical exercises conducted during the training program suggest a shift from a commodity-supplying industry to an industry that produces high-value-added products while generating good jobs. The strategic market segmentation indicates that the segments in which Tunisian products would have the most competitive (and sustainable) advantage are (a) fresh rosemary for gastronomy, (b) fresh rosemary as a functional food and natural health product, and (c) natural extract of rosemary as a functional food and natural health product.

A combination of spontaneous rosemary and rosemary cultivation with an increase in certified organic areas seems the best way to sustainably achieve the objectives of the new strategic direction. A combination of (a) optimization of spontaneous plants, (b) introduction of domestication of traditionally spontaneous species, and (c) development of the rosemary crop of certified organic areas should enable producers to meet a diversified demand while also alleviating pressure on natural aquifers. The analysis led to an action plan structured around six strategic areas of intervention: (a) reform of the forests code, (b) domestication of spontaneous MAPs and planting of cultivated MAPs (c) better access to strategic markets, (d) processing and innovation, (e) coordination of producers and collaboration with industries, and (f) improved access to financing.

4.2 MEDICINAL AND AROMATIC PLANTS GLOBAL OVERVIEW AND SECTORAL TRENDS

MAPs constitute the raw material for processed natural products such as essential oils, dry and liquid extracts, and oleoresins. According to the World Health Organization, medicinal plants are accessible, affordable, and culturally appropriate sources of primary health care for more than 80 percent of the world population, who rely on traditional medicine for their primary health care needs. Traditional health care practitioners, traditional healers, and individual households are typical producers of herbal

⁵⁴ Measuring the size of the sector is a key challenge in itself: there are multiple classifications whereby the same plant can be considered both an aromatic and medicinal species, as is the case for thyme and rosemary. This confusion is mainly caused by the lack of any comprehensive and exhaustive listing of harmonized tariff codes for MAPs. Many countries struggle with the lack of specificity in their tariff schedules and look to add more specific 8- and 10-digit codes for their most important botanical imports and exports.

medicinal products. According to FAO, MAPs can help small-scale farmers to strengthen their livelihoods directly through income generation from their trade as well as health care provision. With strengthened livelihoods comes greater access to a wider range of assets, and a capacity to build these into successful and sustainable activities, thereby reducing vulnerability to poverty in the longer term⁵⁵.

The global medicinal and aromatic plant market size was estimated at US\$71.19 billion in 2016 and is poised to grow to US\$5.00 trillion by the year 2050 (WHO). This growth is attributed to the rise in consumer preferences for traditional medicines and products that are natural, healthy, sustainably produced and fairly traded over synthetic products. In addition, efforts to increase substantial research investments and funding will likely increase market growth in the near future. An estimated 50,000–70,000 medicinal and aromatic species are yearly harvested from the wild. Of these, an estimated 2,500 species of MAPs are involved in international trade (Box 10).⁵⁶

BOX 10: MEDICINAL AND AROMATIC PLANTS CLASSIFICATION

The range of products obtainable from medicinal and aromatic plants (MAPs) is very large and includes phyto-pharmaceuticals, galenicals, health foods, herbal teas, traditional medicines, new drugs, and intermediates for drug manufacturing. From each of those plants, a wide range of products can be gained. For example, herbal products can be used for herbal medicinal products, food and dietary supplements, foodstuffs, and cosmetics. To that diversity, one must add the increasing demand for labeled varieties that guarantee the organic, natural, ethnic, and traditional quality of MAPs, as well as those that guarantee fair trade. Figure 32 gives a comprehensive overview of the transformation processes, most common classification, and labels.

The bulk of traded MAP material is harvested, while only a few species are cultivated. The parts of the wild plants harvested can take many forms, such as the bark, leaves, fruits, herbs, flowers, wood, or roots. Accurate global data on the volume of wild harvested plants is difficult to obtain because it is challenging to distinguish between wild and cultivated material. Cultivated plants are more suitable for large-scale uses, such as the production of drugs by pharmaceutical companies, that require standardized products of guaranteed or known content and quality. Globally, cultivation is limited because it carries higher production costs and requires land ownership.

Production of MAPs and their derivatives is equally shared between developed and developing countries. The majority of production industries are located in industrialized countries, with the exception of China and India, which are among the main exporters of MAPs that also have a large domestic market. Similarly, Germany, Hong Kong SAR, China and the United States play an important role as a trading platform for both import and export activities. China is the origin and the biggest provider of a wide variety of plant-based herbal medicines and ingredients that are consumed within China and worldwide.

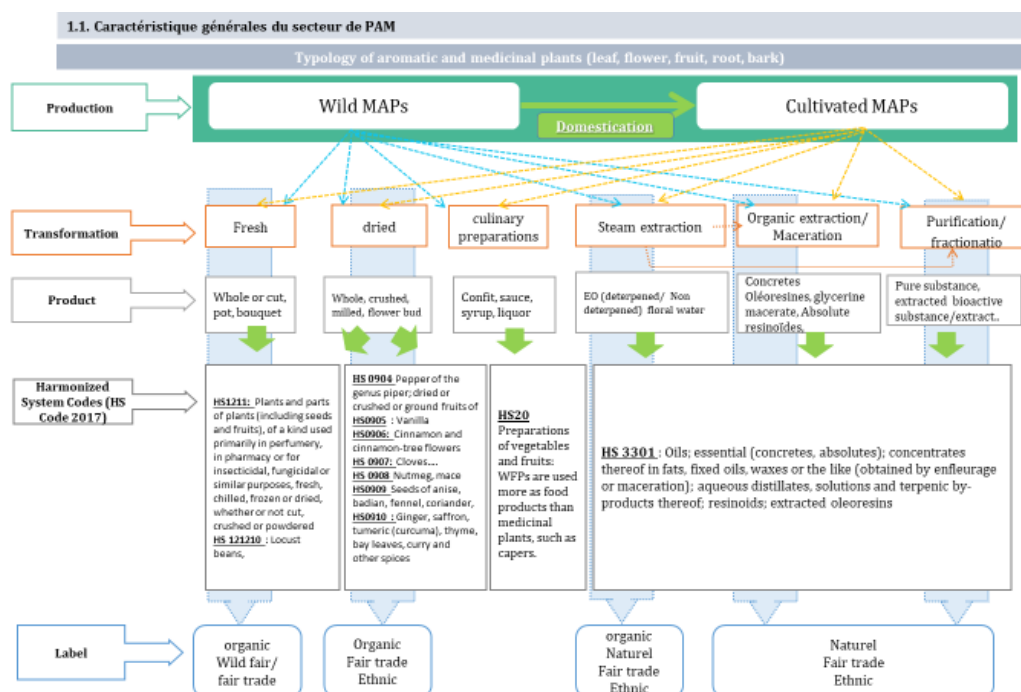
⁵⁵ Health and Wealth from Medicinal Aromatic Plants, FAO, 2012.

⁵⁶ Estimates provided by WHO and ITC.

Production and trade can be analyzed by splitting MAPs into three categories: essential oils, medicinal plants, and condiments.

Figure 32

Medicinal and aromatic plants classification



Source: Flow chart developed by the authors

Essential oils

In 2015, the estimate for the global production of essential oils, resins, and floral waters⁵⁷ was at 110 million tons. ITC estimates an export value of almost US\$ 6 billion in 2018, with an increase in the period 2014–18 of 33,7 (Table 13). According to Grand View Research, the global essential oil market is expected to reach US\$13.94 billion by 2024 and demand is expected to grow at a compound annual growth rate (CAGR) of 8.4 percent from 2016 to 2024.

Table 13

Export of essential oils, 2014–18, US\$, thousands

Exporters	Exported value in 2014	Exported value in 2015	Exported value in 2016	Exported value in 2017	Exported value in 2018
World	4,464,990	4,846,467	4,689,135	5,451,158	5,969,573
India	606,221	572,995	607,726	786,269	859,415

⁵⁷ The sector is listed as the following: Product 3301: Essential oils (terpene less or not), including concretes and absolutes; resinoids; extracted oleoresins; concentrates of essential oils in fats, in fixed oils, in waxes or the like, obtained by enfleurage or maceration; terpenic by-products of the deterpenation of essential oils; aqueous distillates and aqueous solutions of essential oils.

United States of America	566,551	598,495	634,744	729,606	800,233
France	366,053	355,201	396,745	471,278	522,070
China	594,871	793,598	423,524	353,410	469,176
Brazil	228,609	256,877	339,048	431,217	437,220
United Kingdom	267,655	243,714	218,628	277,144	247,155
Argentina	119,500	224,655	196,376	203,718	244,185
Germany	173,876	178,693	191,524	219,207	225,527
Indonesia	156,301	179,905	166,380	160,368	199,266
Spain	125,749	126,830	124,347	160,872	195,944

Source: ITC, Trade Map website, 2019

The United States dominate the essential oil consumer market and accounted for 10,4 percent share of world imports in 2018 (Table 14). The country is expected to maintain its dominant position because of the growing demand for natural cosmetic products, rising awareness, and increasing adoption of innovative essential oil solutions in varied application sectors.

Table 14

Import of essential oils, 2014–18, US\$, thousands

Importers	Imported value in 2014	Imported value in 2015	Imported value in 2016	Imported value in 2017	Imported value in 2018
World	4,160,872	4,430,896	4,609,579	5,394,859	6,041,788
United States of America	858,081	987,623	1,064,404	1,269,446	1,376,067
France	376,506	379,769	386,492	442,192	515,079
Germany	308,413	322,693	355,509	418,333	435,393
India	159,914	160,506	212,284	272,228	388,064
United Kingdom	306,498	326,138	285,067	334,917	340,639
China	221,099	228,330	189,290	204,405	250,003
Indonesia	122,403	114,912	129,440	136,213	211,109
Japan	171,466	155,689	174,622	179,666	208,898
Singapore	133,225	132,688	150,511	169,791	187,943
Netherlands	88,373	90,695	108,753	153,188	186,927

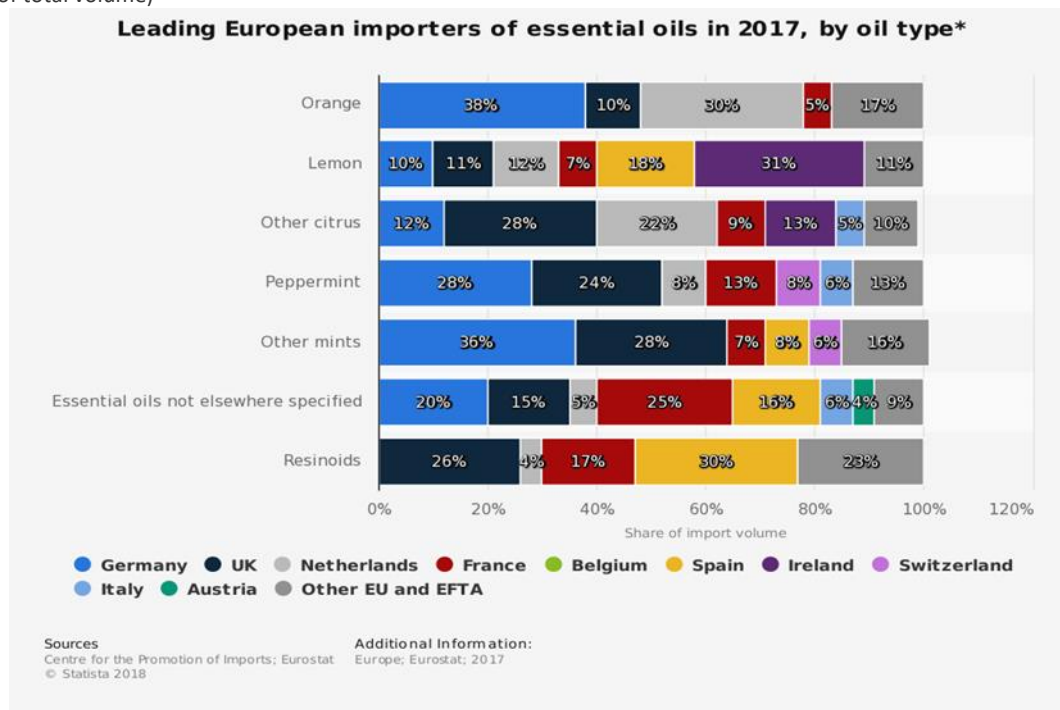
Source: ITC, Trade Map website, 2019

The United States are followed by France (8,5%) and Germany (7,2%), leading European importers. Europe region has highly developed industries, high per capita income, as well as government subsidies and tax benefits that encourage the production and application of essential oils.

Figure 33

Leading European importers of essential oils in 2017

(share of total volume)



Source: Centre for the Promotion of Imports, Eurostat Statistics, 2018

Note: n. e. s. = not elsewhere specified.

Market growth has been fueled by the increasing use of essential oils in the spa, aromatherapy, flavoring, and fragrance industries. Essential oils are also widely used in cleaning and home products owing to their superior antibacterial and antiseptic properties. According to Allied Market Research (2016), the spa and relaxation sector is expected to grow of over 10 percent during the forecast period, followed by the food and beverage and the medical sectors (Box 11).

BOX 11: APPLICATION INSIGHTS OF ESSENTIAL OILS

Essential oils are widely used as flavoring and aromatic agents across a diverse set of end-use industries. These include among others medical, food and beverages, spa and relaxation, as well as cleaning and home industries. Essential oils can provide immense nutritive value to food and increase the overall appeal of products.

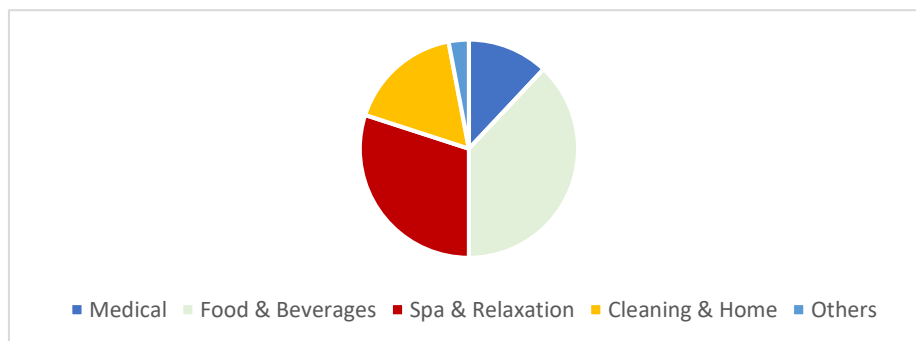
Food and beverages have emerged as the leading segment and accounted for a market share of 32.9 percent in 2015 (Figure 34). Rising consumer income across developing nations coupled with high demand for premium cuisine are expected to contribute to the growth of the segment. Extract oils of orange, lemon, spearmint, anise, asafetida, basil, citronella, coriander, or rosemary are increasingly used to improve flavor in food and beverages instead of whole herbs and spices. Rising demand for attractive color and taste in local dishes further fuels market growth.

The spa and relaxation segment occupied the second largest market share, with 30.84 percent in 2015. Essential oils are beneficial for the stimulation of blood circulation and have excellent soothing effects on the central nervous system. Various health benefits have also fostered product applications in the massage and aromatherapy sectors. The industry will likely progress further with pioneering niche applications and with increasing demand from developing countries such as Brazil, China, and India. Other applications include, but are not limited to, products to repel insects and odors and for pet care, room freshening, sports equipment disinfection, and personal care.

The global essential oil market is highly concentrated among top industry players that create high entry barriers for new participants. Oil production is expensive owing to unique attributes and requires substantial capital investment in advanced equipment. Thus, numerous multinational corporations dominate the industry. Additionally, companies are mostly integrated along the value chain to procure raw materials and perform logistics operations to achieve cost benefits that attract new customers. Major companies that operate in the global industry include Biolandes, Sydney Essential Oils, HRF, the Lebermuth Company, Young Living Essential Oils, doTerra, Essential Oils of New Zealand, Sydella Laboratoire, Farotti Essenze, Moksha Lifestyle Products, West India Spices Inc., Falcon Essential Oil, and Ungerer Limited.

Figure 34

Global essential oils market share by application, 2015 (%)



Source: Grand View Research, 2018

Medicinal plants

Estimates of the global market size of medicinal plants are at about US\$ 72 Billion for 2017 to grow further at CAGR of 14.88% and reach USD 7trillion by 2050⁵⁸. China has the highest number of medicinal plants and also leads the global export ranking of medicinal plants as it holds more than 30% of exports under this category. The export value of medicinal plants was over US\$3.2 billion in 2018.⁵⁹ The growth of this category is mainly due to the continued development of new products and the acknowledgement of the clinical and pharmaceutical value of the plants. After China, main exporters are India and Germany. Main importers are the United States; Germany and Hong Kong SAR (Tables 15 and 16).

Table 15

Exports of medicinal plants, 2014–18, US\$, thousands

Exporters	Exported value in 2014	Exported value in 2015	Exported value in 2016	Exported value in 2017	Exported value in 2018
World	3,575,169	3,161,715	3,116,871	3,213,756	3,223,171
China	1,265,686	1,036,615	1,008,243	964,594	822,422
India	238,708	237,315	259,375	291,971	308,744
Germany	161,791	152,144	151,620	175,219	187,955
United States of America	166,935	140,052	155,193	171,225	184,103
Canada	242,694	226,766	190,765	185,622	131,236
Hong Kong, China	132,151	126,518	130,166	141,078	125,638
Egypt	130,784	118,796	119,187	114,512	110,506
Spain	71,625	69,166	82,032	86,928	87,711
Korea, Republic of	111,840	88,896	54,430	71,269	84,913
Poland	66,941	59,758	56,835	61,828	84,050

Source: ITC, Trade Map website, 2019

Table 16

Imports of medicinal plants, 2014–18, US\$, thousands

Importers	Imported value in 2014	Imported value in 2015	Imported value in 2016	Imported value in 2017	Imported value in 2018
World	3,269,908	3,079,249	3,100,531	3,139,726	3,407,071
United States of America	392,347	393,623	413,369	409,819	453,012
Germany	271,041	247,955	262,270	288,796	338,571
Hong Kong, China	376,312	427,252	373,955	307,608	311,652
Japan	305,342	247,352	312,743	272,425	272,657
Taipei, Chinese	124,456	136,969	135,887	136,126	157,459
China	215,308	139,314	104,750	103,117	125,390
Singapore	155,934	117,519	110,858	102,593	106,004
Korea, Republic of	97,937	97,163	96,777	95,896	102,416
United Kingdom	81,389	61,679	56,819	77,941	101,790

⁵⁸ Bhandari Tejasi Shyam, Medicinal plants Industry 2017 Presentation, 2017.

⁵⁹ Medicinal Plants represents more than 60 percent of the broader category 1211, which includes plants and parts of plants, including seeds and fruits, of a kind used primarily in perfumery or medicaments or for insecticidal, fungicidal, or similar purposes, fresh or dried, whether or not cut, crushed, or powdered.

France	102,487	84,153	90,926	98,609	97,570
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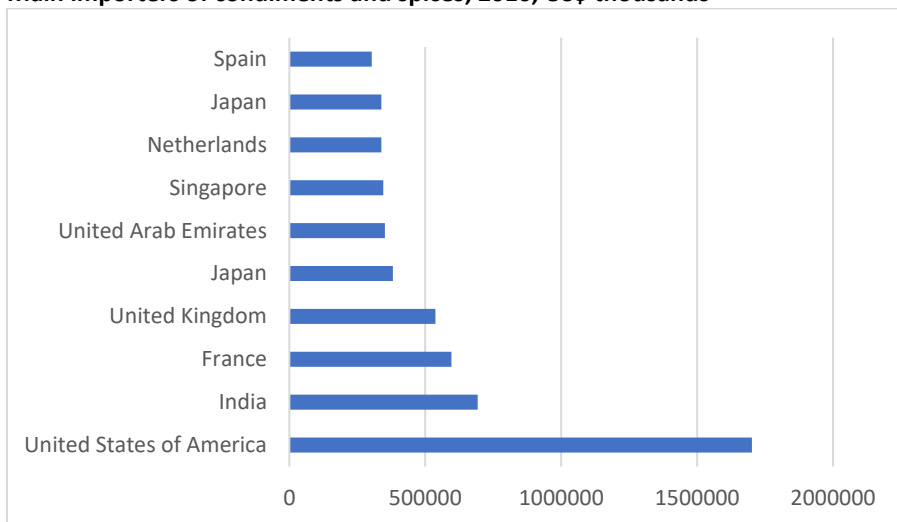
Source: ITC, Trade Map website, 2019

Condiments and spices

Demand for condiments and spices also continues to grow with the quantity of products sold under the category of sauces, dressings, and condiments increasing during the period 2008-2013 from 31,749,000 to 35,795,000 metric tons⁶⁰. About 50 of the 86 spices produced in the world are grown in India. The sauces and condiments category is dynamic, with large differences in consumption patterns among countries. ITC statistics show an annual increase of trade in the period 2011–16 for the trade categories (0904 to 0910)⁶¹. Main importer countries are the United States, India, France, the United Kingdom, and Japan (figure 35).

Figure 35

Main importers of condiments and spices, 2016, US\$ thousands



Source: ITC, Trade Map website, 2017

4.3 THE CASE OF ROSEMARY IN TUNISIA

Rosemary is the most exploited aromatic and medicinal plant in Tunisia, followed by myrtle. Rosemary is a perennial bush that grows in abundance in the Mediterranean area (Italy, Southern France, Greece, Portugal, Spain and countries of the Maghreb, as well as in isolated areas of Lebanon, and Turkey). It is one of the most common aromatic wild plants of the Mediterranean landscape, especially in rocky limestone hillsides adjoining the seaside.

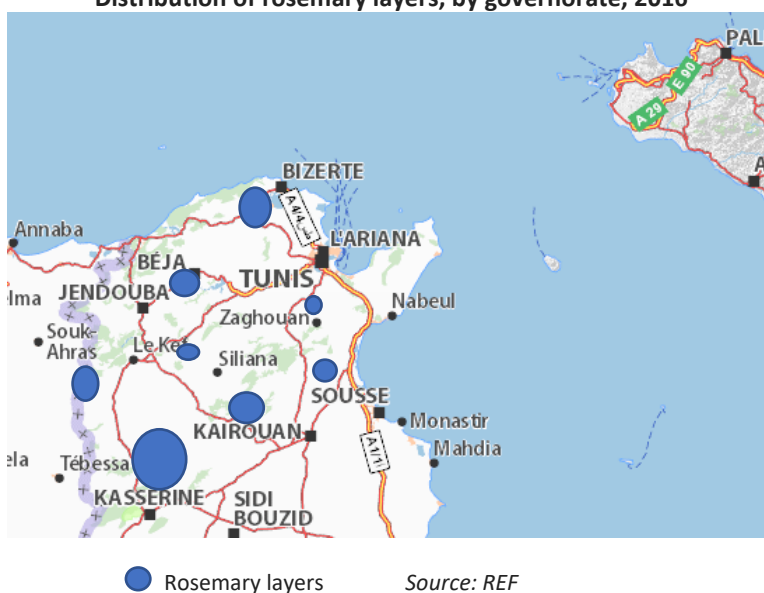
⁶⁰ García-Casal MN., Peña-Rosas JP., Malavé HG, *Sauces, spices, and condiments: definitions, potential benefits, consumption patterns, and global markets*, 2016.

⁶¹ Spices can be leaves (such as bay leaf and vanilla) (0905); buds (such as, cloves) (0907); barks (such as cinnamon) (0906); roots (such as ginger) (0910); berries (such as grains of pepper) (0904); seeds (such as cumin and nutmeg) (0908 and 0909), or even the stigma of flowers (such as saffron) (0910). The condiments include spices (as herbs or spices) but also salt, bouillon cubes, soy sauce, fish sauce, and ketchup used for adding flavor to foods (Maria Nieves Garcia-Casal 2016).

Tunisia has more than 300,000 hectares of rosemary managed by the Régie d'Exploitation Forestière (REF; Forest Management Board), which, to preserve the layers of rosemary, makes available only one-third of this area to exploiting industries each year. Since 2015, almost all areas put out to tender (69,000 hectares in 2014, 90,403 hectares in 2015, and 77,646 hectares in 2016) have been sold. The governorate of Kasserine offers an average of 50 percent of the areas put up for tender each year (30,396 hectares in 2016; Figure 45), knowing that rosemary from this region possesses very specific desirable qualities.⁶²

Figure 36

Distribution of rosemary layers, by governorate, 2016



Tunisian fresh rosemary production for essential oil is between 25,000 and 30,000 tons per year. Every year, the rosemary industry generates around 5,760 working days for the collection and 2,920 working days in the related industrial extraction, with an annual total of 8,680 labor days (Table 17). Concerning revenues, the share of the essential oils revenue going to pickers is 20-21% with a daily revenue between €2.75 and € 3.44.

Table 17

The essential oil of rosemary industry in Tunisia

Tunisia essential oil yearly production (ton/year)	135 tons/year
Essential oil price (€/kg)	€35–€45 (organic)/kg
Essential oil annual revenue (€)	€4,725,000–6,000,000
Essential oil yield (kg of oil/kg of fresh product)	4/1,000
Tunisian fresh rosemary production for essential oil	25,000–30,000 tons/year
Average daily rosemary harvest/picker	100–150 kg/day/picker
Average weekly rosemary harvest/picker	400 kg/week/picker
Number of picker working days per year	170,000–300,000 days/year
Price of rosemary	TD 0.12/kg = €0.044/kg
Revenue to the pickers/year	TD 3 to 3.6 million/year = €1 to 1.2 million/year
Weekly revenue for the pickers	TD 48/week = €17/week
Daily revenue for the pickers	TD 8–10/day = €2.75–3.44/day => under the SMAG (TD 13.736 per day)

⁶² Analysis produced during the training program, based on data from the REF and the DGF.

Share of the essential oils revenue going to the pickers	20–21%
--	--------

Source: Analysis produced during the training program, based on data from the REF and the DGF

Note: SMAG = salaire minimum agricole garanti

In recent years, Tunisia export of oil of rosemary represented more than 40% of total essential oil export (Table 18)⁶³. Rosemary essential oil is usually sold in bulk and cannot be sold in dispensaries because of the lack of certification.⁶⁴ The oil is typically purchased by international companies in the perfumery, cosmetics, and detergents industries.

Table 18
Export/Import of essential oil of rosemary, Average 1999-2014
(US\$, thousands)

EXPORTATION (AVERAGE 1999-2014)					IMPORTATION (AVERAGE 1999-2014)			
Products	Value (TD)	% of Total Essential oil	Volume (Kg)	% of Total Essential oil	Value (TD)	% of Total Essential oil	Volume (Kg)	% of Total Essential oil
Rosemary Essential Oil, not terpenated	2 210 831	15,79	64 613	19,40	537	0,04	8	0,01
Rosemary Essential Oil, terpenated	1 360 248	9,70	31 495	9,46	5 942	0,43	125	0,19
Terpenic by-products of essential oil's deterpenation	1 055 163	7,53	39 941	11,99	1 097	0,08	38	0,06
Total	4 626 243	33,03	136 048,39	40,84	7 576	0,55	171	0,26

Source: Institut des statistiques Tunisie (2016).

The main importers are France (64,7 percent), Spain (8,1 percent), and Germany (7 percent). In the United States, Tunisia is the third-largest supplier. This may be due to the competitive price of Tunisian rosemary essential oil (Table 19).

Table 19
Price of rosemary essential oil, 2016, US\$

Conventional rosemary essential oil Price (US\$)	
Tunisia	\$55
Portugal	\$55
Spain	\$68 drum
France	\$78
Organic rosemary essential oil Price (US\$)	

⁶³ Annex F provides a breakdown of the Tunisia export of essential oil, concrete or absolute (33011).

⁶⁴ "The ISO standards are still in development and are not yet widely used. However, these standards are an option for small producers to whom certification is too expensive. Some natural producers actually bypass the need for organic and natural certifications if they adopt good practices in the supply chain. Not every customer is willing to pay extra certification, however, it is important to start looking at this area in Tunisia and be aware of the changes happening in regulation in other countries".
FHI 360, Final Report - Strategic Segmentation of the GVC of Essential Oils and Natural Extracts, 2018.

Spain	\$42Kg
Tunisia	\$25Kg

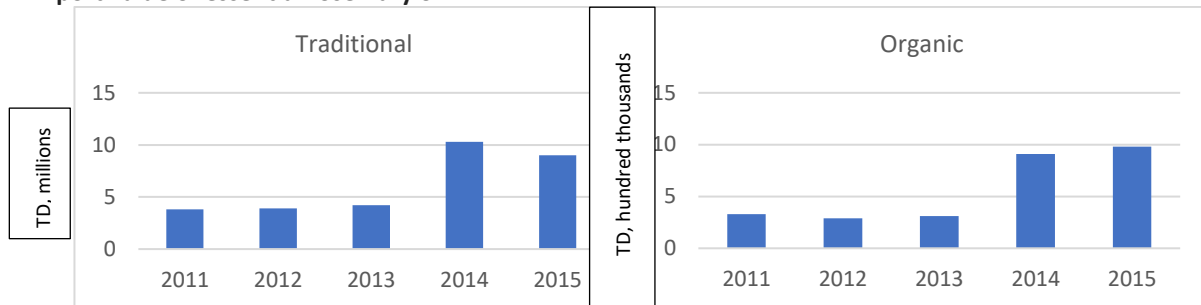
Source: ITC

Note: Prices are wholesale for quantities of 25kg or more unless otherwise stated

Due to price elasticities, rosemary oil exports recently decreased while export values soared. From 2011 to 2015 period, the rosemary oil exports decreased from 165 tons in 2011 to 118 tons in 2015. The export value, however, increased over the same period from around 1,4 million US\$ (TD 4 million) to 3,5 million US\$ (TD 10 million). This can be explained by the rise in world prices and a change in the composition of rosemary oil exports, to more organic varieties (Figure 37).

Figure 37

Export value of essential rosemary oil



Source : Institut des statistiques Tunisie (2016)

4.4 STRATEGIC MARKET SEGMENTATION

The strategic market segmentation conducted during the training program focused on rosemary and identified the following segments as most attractive for the rosemary industry:

- **Fresh rosemary for gastronomy (organic).** In this segment entry barriers are medium and essentially require an initial investment in the cold value chain. There are no surrogates. Consumers and buyers demand top quality, freshness, and flavor of fruits. The main clients are markets of fresh MAPs, grocery stores, and specialized wholesalers. Competition is low, because only a few countries produce fresh rosemary. It is a very attractive segment because of the growing demand for natural, healthy, and organic products that are unprocessed and offer beneficial effects for health (antioxidant, in the case of rosemary).
- **Fresh rosemary as a functional food and natural health product.**⁶⁵ In this segment, processing is limited. Rosemary can incorporate organic aliments (nutraceutical), be used in organic rosemary infusions, or facilitate digestion and depurative functions. Entry barriers are medium and essentially require an initial investment in the cold value chain. Some products, like thyme, could act as surrogates. Main clients are platforms of fresh products, having weak bargaining power because of the need of quality. As in the previous segment, quality control and cold chain are very important. In addition, the development of high-quality packaging and the capacity to present the product well are fundamental to attract final consumers. Competition

⁶⁵ A functional food is a food given an additional function (often related to health-promotion or disease prevention) by adding new ingredients or more of existing ingredients.

is low, as only few countries export fresh, little transformed, rosemary. It is a very attractive segment because of the growing demand for natural, healthy, and organic products.

- **Natural rosemary extracts.** For the pharmaceutical sector, it is difficult to enter the market because suppliers need to ensure long-term access to raw materials and demonstrate the sustainability of well-established supply chains, thus opportunities for new entrants are limited. Also, the investment needed for extraction equipment (super critical fluid, ionization), certification, technical forms, and analysis could be prohibitive. Barriers to enter the market increase because ingredients require tertiary processing (or advanced processing). Competition from surrogates is high because of synthetic or natural products that contain similar or identical properties. Also, producers face the bargaining power of a buyers' market. The segment is consequently not attractive.

However, innovations in the natural extraction of rosemary have moved it from a herbal medicinal product to a food supplements, or para-pharmaceutical sector. This is a segment characterized by fewer entry requirements and more flexible, market-oriented buyers. Innovation is more relevant in certain indication areas, such as joint health, than in others. The threat of substitutes could be reduced through the establishment of close customer relationships. Wild rosemary extract is intended for drugstores and organic health shops. The segment of rosemary extract is very attractive because consumers increasingly demand healthy products and dietary supplements.

SWOT analysis of the Tunisian rosemary industry highlighted the following points, which are also valid for the rest of wild MAPs:

Strengths

- Flora biodiversity, caused by large variations in climatic conditions (from humid to arid)
- Privatized sector, from collection to processing and commercialization (unlike cork)
- Low labor costs
- Good management of wild MAP areas by competent authorities
- Availability of certified laboratories and high-level competences
- Existing development strategy for organic production

Weaknesses

- Current tendering system remains vulnerable to the creation of cartels in the sector
- Limited awareness of international standards and opportunities among most private sector actors
- Use of substandard techniques in the collection and treatment for most industrial exploitation
- Limited mastery of the cold chain
- Limited access to finance and subsequent high cost of capital investments
- Limited number of certifications that are required by high-value-add markets such as aromatherapy, cosmetics, phytotherapy, and agrifood
- Limited focus on innovation and competitiveness in global markets by professional organizations

Opportunities

- A growing global market with high interest for phytotherapy and the health industry
- Increasing "natural and organic" consumption that paves the way for use of several wild species

Threats

- Climate change and related environmental threats to the species
- Aging of the layers
- Wildfires that hinder access to forests
- Global market entry of new producing and exporting countries
- Commercialization rules on the international market
- Competition from “synthetic” substitutes
- High fluctuation of market prices

4.5 CONSTRAINTS ON ROSEMARY - AND MAPS AT LARGE

Major constraints to the development of the rosemary value chains are quite similar and shared with other MAPs, and could be discussed jointly. They can be divided into common constraints that are valid for both, wild and cultivated MAPs, and specific constraints for each category:

Common constraints

- **The national regulatory framework does not promote international standards.** The extraction and processing of essential oils are based on old practices, such as the use of a copper still, providing a medium-quality product with low value added. The only exception in Tunisia is Agriland, a Tunisian company, specialized in the production of natural ingredients using a green and biological extraction process: the supercritical fluid.
- **Limited access to working capital for SMEs,** as commercial banks have only limited awareness of the opportunities and characteristics of the sector.
- **Lack of adapted cold logistics services.** In the current system, the production of fresh MAPs is less effectively controlled than production of industrial products. In addition, the lack of a specialized workforce is added to the low level of utilization of refrigerated containers and inadequate extraction, transport, and storage conditions. Cold chain logistics and a trained workforce are interlinked to ensure fresh culinary herbs are stored and handled under proper conditions. The workforce should be trained on best practices and good manufacturing processes.⁶⁶
- **Weak strategic positioning.** The current commercialization strategy is almost entirely focused on the sale of essential oils in bulk. Most Tunisian exporters do not seem to have a differentiation strategy and often prefer to sell oil to consolidated international partners; they appear to have limited appetite to progress along the value chain. Only a limited number of SMEs in the sector are equipped with a marketing department.

Specific constraints for wild MAPs

- **Access to natural resources.** Tunisia’s regulatory framework fails to prevent oligopolies. The dominance of big players in contract awards minimizes the access of young entrepreneurs. In addition, the inadequate implementation of the regulatory framework to preserve wild MAPs represent a serious obstacle for sustainable development of the sector. The current legal framework for forest exploitation is unable to avoid overharvesting or unskillful harvesting.

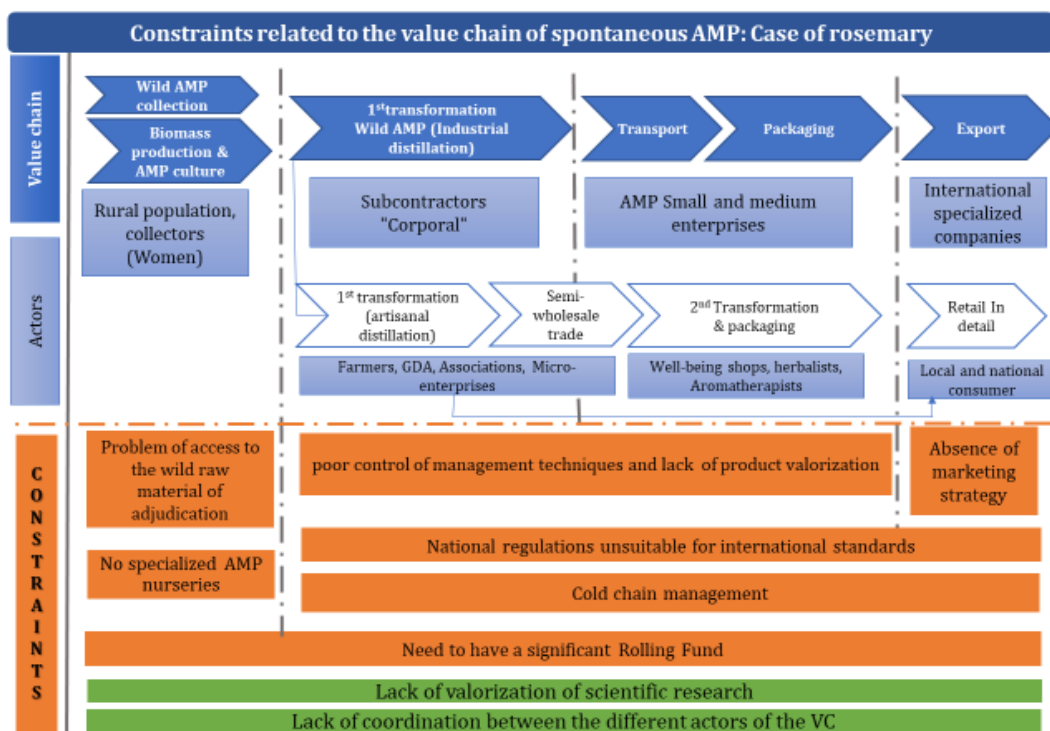
⁶⁶ For example, when fresh MAPs arrive at the packinghouse, they should be cooled to remove the field heat. If the warm plant is immediately put into cold storage, without being cooled, condensation may occur and cause microbial growth. Also, when the product arrives, reception workers should ensure that incoming documentation provides sufficient information to facilitate product traceability; the processor must establish a system to maintain that documentation.

Specific constraints for cultivated MAPs

- Lack of development of cultivation practices and processing methods.** There is a systemic lack of specialized nurseries, insufficient research and development of cultivation techniques for domestication of spontaneous MAPs, and consequently an absence of cultivation of new varieties. This limits the capacity of producers to diversify their offerings and to cope with the minimum required volumes that are needed to enter certain markets.

Figure 38

MAPs constraints mapped on the rosemary value chain



Source: Value Chain Development Training Program

4.6 WHAT IT WOULD TAKE TO SEIZE THIS OPPORTUNITY

A shift from a commodity-supplying industry to a more competitive industry would require a coordinated and substantial effort. This undertaking would, however, lead to more and better jobs and value-addition, especially within the context of an integrated approach.

Value can be added at different levels, such as at farm, village and town, regional and national level. At farm level, simple value addition such as to clean, sort and grade, dry, cut, and powder. At the village and town level through the preparation of simple value-added products such as herbal teas, health drinks, soaps, incense sticks and so on. At the regional and national level, through high-level value addition with the establishment of herbal extraction units to extract concentrated and purified extracts or create a class of compounds or pure compounds or prepare herbal medicines.

The combination of wild rosemary and rosemary cultivation with an increase in certified organic areas is essential to achieve the objectives sustainably⁶⁷. Because naturally harvested rosemary is constrained by access to forest resources, an increase in rosemary cultivations should allow the Tunisian industry to meet the demand for rosemary and to facilitate certification for organic production. Because of a higher biochemical composition, spontaneous rosemary is best reserved for higher value-added uses (nutraceuticals, pharmaceuticals, cosmetics). Cultivated rosemary could be used in less demanding segments, that would take advantage of the concentration of bioactive principles, such as detergents.⁶⁸

An action could be based on six strategic areas of intervention:

- **Reform of the Forests Code**

A pilot program could experiment with a more flexible and proactive regulatory framework that would improve access to forest resources through (a) the introduction of more flexibility in the part of the forest code dedicated to access, (b) enhanced local management capacities, (c) capacity building for stakeholders in the field of co-management of natural resources, (d) regeneration of damaged forest areas using spontaneous MAPs with high market potential, (e) and a bonus/malus system for successful bidders to ensure responsible use of resources⁶⁹.

The expected effect on the value chain would be the provision of better and sustainable access for young entrepreneurs, increased productivity of layers of plants through the reduction of rotation to two years, and better balance between biodiversity and economic exploitation.

- **Domestication of spontaneous MAPs and planting of cultivated MAPs**

Cultivation of MAPs today is not only a promising alternative and counterpoint to wild collection, enabling preservation of natural genetic variability and survival of rare, endemic, vulnerable and endangered species, but also represents a powerful economy branch providing the high class quality raw material for pharmaceutical, cosmetic and the food industry. For instance, cultivated MAP material is increasingly preferred by the herbal industry, because it is easier to predict plant yield, quality and drug composition, especially when compared with wild harvested raw materials⁷⁰. Domestication and planting could involve financial assistance for applied research on cultivation of wild varieties. For cultivated MAPs, actions could involve applied research contracts to improve scientific and economic knowledge. Common actions shall be taken to (a) register Tunisian cultivars at the Banque National des Genes, (b) identify pilot farms in the North and Centre West regions, (c) support nurseries that specialize in the mastery of spontaneous and cultivated MAPs, (d) train trainers on MAPs cultural techniques and organic agriculture, and (e) diffuse of best practices. The objective is to increase and master cultivated MAPs production to better meet international market demand.

- **Collection of more information to gain access to strategic markets**

Study and business travel to visit less-known international buyers could improve the market orientation of firms and producers. Benchmarking trips to places with success stories in the region

⁶⁷ This also applies to many MAPs, see annex F for the proposed strategy of the MAPs sector at large, which is based on the same principle as stated here for rosemary.

⁶⁸ The difference between wild and cultivated rosemary is the bioactive properties. A big part of wild rosemary essential oil (65 percent) is used by industries to produce scented products such as detergents, paper towels, and air fresheners. The cultivated MAP contains a lower level of bioactive substances than does a wild MAP. Cultivation would enable producers to provide that crop's essential oil for detergents and keep the wild MAP for pharmaceutical uses.

⁶⁹ The term Bonus-Malus is used for business arrangements which alternately reward (bonus) or penalize (malus).

⁷⁰ Pljevljakusic Dejan, Dajic Stevanovic Zora, *Challenges and Decision Making in Cultivation of Medicinal and Aromatic Plants*, 2015

(such as Morocco for argan oil, Bulgaria and Turkey for roses, and Chios island for mastic) could also increase the appetite of entrepreneurs and raise expectations. Additional actions in this area would provide (a) improved visibility through participation at fairs such as “Food Ingredients Global” in Frankfurt, (b) better market analysis, and (c) adequate training on marketing techniques in the sector.

Through these actions, it is expected that Tunisian firms and producers along the value chain would gain (a) strategic knowledge of market trends and preferences, (b) marketing techniques and positioning on the most attractive segments, (c) acquaintance with best practices and standards, (d) leverage within new distribution channels such as virtual markets, and (e) increased visibility and improved image in international markets.

- **Processing and innovation**

The sector’s focus should be on improvement of the cold chain. Authorities should consider capacity building for local SMEs on new processing techniques. In addition, a worthwhile investment could be the creation of a Tunisian MAP label that would align with international standards and best practices. The main effect on the value chain would be the upgraded quality of exported products and, more generally, gains in productivity and use of technology.

- **Coordination of producers and collaboration with industry**

This activity includes support to (a) organize forest populations (spontaneous MAPs) and farmers (cultivated MAPs), (b) create links between local producers and applied research centers, and (c) draft a “contrat de culture” between producers and industrial companies. The result would be better collaboration and creation of synergies that should improve economic performance of the entire value chain.

- **Access to financing**

Actions to be considered should include the provision of loan guarantees for working capital and investment projects and of technical assistance to the banking sector to lower risk and improve opportunity assessment in the sector.

ANNEX A: FIVE FORCES METHODOLOGY USED FOR THE MARKET SEGMENTATION EXERCISE

Strategic segmentation defines key target markets and helps businesses determine their strategic position within these markets. This is useful to understand the strength of both the current competitive position in a market and a position that can be developed in the future. Strategic analysts often use segmentation to understand if new products or services are potentially profitable because it helps them recognize where the bargaining power lies, what the strengths are and how to improve the weaknesses. The segmentation exercise uses the five forces of competitive intensity analysis developed by Prof. Michael Porter (M. Porter 1979), as part of the framework to evaluate competitiveness and the position of businesses.

The knowledge of the structure of a segment and the forces acting on it enables companies develop appropriate strategies to position themselves well within an industry. A business or market segment includes products that have the same production technology, competitors, and customers. In any segment, the profit achieved by businesses is the result of the conditions created by five forces. Three of these forces are said to be “horizontal” and explicitly competitive: the level of competitiveness or rivalry among firms that compete in the segment, the threat of entry by potential entrants, and the threat of substitutes. The other two forces are “vertical” and both competitive and complementary: the bargaining power of the suppliers and the bargaining power of the customers who are the buyers. A collection of data on the forces in each segment leads to the identification of the most “attractive” market segment for a business.

Force 1: Rivalry between firms in the sector

Competition between firms depends on structural and behavioral determinants. Namely, the structure and the evolution of costs, the importance of the recourse to capital, the level of use of the factors of production, and the available capacity.

Force 2: Threat of entry, barriers to entry

Threat of entry analysis is related to barriers to market entry. These can take several forms: the scale and the required investments, the differentiation of products and the existence of strong brands, experience, and access to distribution channels.

Force 3: Threat of substitute products

The existence of substitutes which, in the eyes of the purchasers, fulfill the same functions as the reference product puts pressure on the sector and the value it can create.

Strength 4: Bargaining power of suppliers

This power increases with the size and concentration of suppliers compared with more atomized buyers in the reference sector. This power also increases with the differentiation of the inputs sold by suppliers and the transfer costs that their customers (the players in the reference sector) should bear if they change their input, their supplier, or both.

Strength 5: Bargaining power of customers

The most decisive factor in the power of buyers, in addition to the quantity they acquire, is the size and concentration of buyers of the reference product in relation to its manufacturers.

ANNEX B: A VALUE CHAIN AND CLUSTER DEVELOPMENT TASKFORCE IN LAGGING REGIONS

In parallel to the work on the World Bank's technical assistance⁷¹ documented in this report, value chain development or related activities have been adopted in four World Bank operations in Tunisia. Following this decision, the government created a joint value chain development taskforce. This taskforce has been set up to conduct coordinated value chain development for better jobs in Tunisia. The taskforce aims to increase the efficiency and effectiveness of the support for job creation, enhanced competitiveness, and economic growth in targeted lagging regions and to mitigate political economy and capture risks.

INSTITUTIONAL STRUCTURE AND ORGANIZATION OF THE TASKFORCE

The Taskforce brings together a trained team of specialists to leverage an analytically rigorous yet strongly participatory approach. The Taskforce is composed of civil servants, essentially hailing from four key Tunisian MSME support agencies (APIA, APII, CEPEX, TIA) as well as two (sub)regional development institutions (Office de Développement du Nord-Ouest – ODNO - and the Office de Développement du Centre-Ouest - ODCO).

Although geographically decentralized, the Taskforce is institutionally hosted within Tunisia's export promotion center, CEPEX and operates on a multilateral memorandum of understanding to be signed between the agencies involved before project launch. This memorandum of understanding specifies the governance mode of the Taskforce (its chairman, advisory board, and operations manual), as well as its objectives and performance indicators.

DECENTRALIZATION OF THE TASKFORCE TO ENSURE PROXIMITY TO THE FIELD

The Taskforce leads the technical part of the value chain development activities foreseen in all four projects. The Taskforce thereby ensures coordination in a way that the proposed investments remain complementary to support the development of the various value chains targeted throughout the identified regions.

The decentralization objective of the Taskforce aims to (a) gather information from local actors in the value chain to carry out a structured and participatory diagnostic; (b) establish a continuous and structured dialogue with the various local actors of the value chain and ensure continuity and overall coherence between analytical market work and fieldwork with the participation of local actors; (c) define in consultation with local companies and producers, as well as the professional organizations concerned, the business plans necessary for the development of targeted value chains; and (d) ensure strong coordination with the decentralized bodies.

WORK METHODOLOGY AND SPECIFIC ACTIVITIES

Main beneficiaries of the Taskforce's work are vulnerable farmers, producers, self-employed service providers, and/or micro firms in lagging regions that are unable to access higher value-added markets, or achieve higher productivity, due to failures of coordination and information. In order to insure

⁷¹ Value Chain Development for Jobs in Lagging Regions—Let's Work Program in Tunisia

proximity to beneficiaries, a large part of the team is decentralized, based in local offices within the targeted lagging regions.

The Taskforce provides a package of support services to beneficiaries :

- Identify and analyze higher value-added markets for targeted products and services;
- Facilitate public-private dialogues (PPDs) to allow champions and motivated players to develop market-based strategies and competitive advantages;
- Identify investments and common services (such as cold chain services and packaging and marketing services) needed to tackle value chain–level market failures, decrease intermediation costs on local MSMEs, and increase their access to strategic market segments with higher value added and returns;
- Identify policies (via the PPD) that can strengthen the competitiveness of the chain or improve the business climate for the targeted value chains or regions as a whole.

MAIN OUTPUTS

The outputs of the Taskforce include:

- **An Investment and Value Chain Business Plan**, a public, technical document that describes and justifies all the necessary activities in a specific value chain that has gone through all the stages of a structured diagnosis of the value chain.
- **Individual grant plans for applicants for support funds**, which are technical documents (business plans) that describe the activities that will be undertaken by the applicants to the fund to respond to a line of action or activity planned by the BIP (Business Improvement Plan)⁷² and for which a call is launched competitively according to a defined Terms of Reference.

These outputs will then be leveraged by the investment projects toward the most effective actions for the development of value chains. The effect of the action on the development of the local productive industry (especially in the targeted disadvantaged regions) would then be strengthened.

⁷² The Business Improvement Plan (BIP) is the basis for identifying investment plans and actions needed to be undertaken in Public-Private Dialogue (PPD).

ANNEX C: HYPOTHETICAL EXAMPLE OF POSSIBLE ENTERPRISE SUPPORT SERVICES FOR VALUE CHAIN UPGRADES IN TUNISIA

(Adapted from the restructured Business Development and Investment Project IDA Grant H865-0-HT – P123974, Annex 2)

The project will establish and support the operations of Entrepreneur Support Services (*Service d'Appui aux Entrepreneurs*, or SAEs) in the departments of Tunisia that will manage and implement the sector-specific value chain diagnostics and the business improvement plans (for the value chain), through the provision of consulting and nonconsulting services, goods, training, and operating costs.

The establishment of the SAE program introduces a new service in all 10 regional departments, which provide local support to MSMEs and are currently limited or inexistent. Each SAE comprises three mobile agents, who are staff members of existing ministries and agencies (agronomist, economist, industrial engineers, and so on) like the ones who participated in the training program funded by the Let's Work Project. These teams will carry out the value chain diagnostics and business improvement plans for existing value chains in their departments.

The SAE teams' capacity in value chain diagnostics and business improvement plans will be enhanced through a training program partially financed by the project and by grants. The training program takes a "learning by doing" approach, in which the SAE mobile agents receive in-class training and carry out their value chain diagnostics in the field, all as they receive continuous support from coaches. In each value chain, the mobile agents will identify local value chain agents (MSMEs such as smallholder producers and farmers, associations, and cooperatives) bring them together in public meetings, present the findings of the value chain diagnostics, and identify investments, reforms, and capacity building needs to increase competitiveness of the MSMEs.

At the end of each value chain diagnostic, the participant MSMEs in the value chain will have a set of recommendations that will be integrated into a business improvement plan that details the investments needed to make the value chain more competitive, increase productivity, and boost local shared value (the value for the poorest MSMEs). Furthermore, SAE teams will also work with the MSMEs in their value chain to develop business improvement plans to identify common services needed to increase shared value and reach more lucrative markets.

The project will finance the initial one or two value chain diagnostics and business improvement plans per department, but with the training and capacity building received the teams should be able to continue to implement services in new value chains year after year. Other similar teams from other WBG projects in the same or other departments may work with the same methodology and thus coordinate their actions locally and with national-level policies.

ANNEX D: LIST OF THE MOST IMPORTANT MEDICINAL AND AROMATIC PLANTS (MAPS)

Of the more than 2,500 botanical raw material species in global commerce, the International Trade Centre (ITC) identified the most important exported natural products (in terms of value and volume).

Acacia gummy exudates	Dhattura seed	Nettle root
Açacia fruit	Echinacea herb & root	Nigella seed
Althaea flower	Eleuthero root	Noni fruit
Ambrette seed	English lavender flower	Olive leaf
American ginseng root	Ephedra herb	Opium poppy latex
American storax balsam	Epimedium herb	Oregon grape root
Amla fruit	Eucalyptus oil	Parmelia lichen extract
Andrographis herb	European vervain	Passionflower
Arnica flower	Fennel fruit	Peony root
Aronia fruit juice concentrate	Fenugreek seed	Pepper fruit
Artemisia essential oil	Feverfew leaf	Peppermint leaf essential oil
Artichoke leaf	Fig fruit	Pleurisy root
Asafetida oleo-gum-resin	Flax seed	Pomegranate fruit
Ashwagandha root	Garcinia fruit extract	Psyllium husk
American ginseng root	Garlic bulb granules	Pygeum bark
Asian ginseng root	Garlic oil macerate	Pyrethrum flower extract
Bacopa herb	Ginger rhizome	Red clover herb
Baobab fruit	Ginkgo leaf	Red poppy petals
Benzoin tincture	Goldenseal rhizome	Reishi mushroom
Bilberry fruit	Gotu kola herb	Rhatany root & tincture
Birch leaf	Grape fruit	Rhodiola root
Bitter orange fruit	Greater celandine herb	Rooibos leaf
Black cohosh rhizome	Green tea leaf	Rosemary leaf
Black currant dry extract	Griffonia seed	Safed musli root
Bladderwrack thallus	Guarana seed	Saffron style and stigma
Boldo leaf	Guggul resin	Sage leaf
Boswellia serrata	Gynostemma herb	Saigon cinnamon bark
Buchu leaf	Henna leaf	Sandalwood heart wood
Calendula tincture	Hibiscus flower	Sargassum thallus
California poppy herb	Holarrhena bark/root	Saw palmetto
Camphor, natural	Hoodia gordonii extract	Schisandra fruit
Caralluma extract	Hop strobile	Seabuckthorn fruit
Cat's claw bark dry extract	Iceland moss	Senna pod & leaf
Chá-de-bugre dry extract	Indian frankincense extract	Slippery elm bark
Chamomile flower	Ivy leaf	Soursop leaf
Chaste tree fruit	Jamaica quassia stem wood	Spearmint leaf
Chinese asafetida resin	Juniper tar	St. John's wort herb
Chinese cinnamon bark	Khella fruit	Stemona root
Chinese hawthorn fruit	Kohki leaf	Stinging nettle leaf
Cinnamon bark	Labdanum gum resinoid	Suma root
Citronella essential oil	Lavender flower essential oil	Sutherlandia herb
Clove bud tincture	Lemon balm leaf	Sweet wormwood
Cocoa butter	Lemon verbena leaf	Thyme herb
Cola nut	Licorice root	Tribulus fruit
Coriander fruit essential oil	Long-stamen onion bulb	Usnea lichen extract
Corydalis yanhusuo tuber	Maca hypocotyl	Uva ursi leaf
Cottonseed oil	Maritime pine bark	Valerian root
Cranberry fruit	Marshmallow root	White tea leaf
Cupuaçu fruit powder	Maté leaf	Wild cherry bark
Damask rose essential oil	Meadowsweet herb	Wild yam root
Dandelion root	Milk thistle fruit	Willow bark
Danggui root	Molokhia leaf	Witch hazelRhodiola root
Devil's claw root	Myrrh tincture	Rooibos leaf
	Neem leaf	Rosemary leaf
		Seabuckthorn fruit
		Wolfberry
		Yarrow herb essential oil

ANNEX E: MAPS IN TUNISIA

NATIONAL OVERVIEW

Tunisia has a high diversity of plants due to its varied topography, climate, and edaphic conditions⁷³. Its flora includes more than 2,000 species, which grow in various bioclimatic zones. MAPs are important for the well-being of the population, especially the rural poor, who depend on these resources to treat human and livestock ailments and diseases. Medicinal and aromatic plants (in the wild or in cultivation) protect the soil from excessive degradation and desertification.

According to the Tunisian Agence de Promotion des Investissements Agricoles (APIA), the country's medicinal and aromatic plants sector contributes 0.8 percent to the value of agricultural production, and 1 percent to the overall export. The sector benefits from many comparative advantages such as low production costs, favorable climatic conditions, large areas of spontaneous harvesting, and proximity to the biggest importing market, the European Union.

Most Tunisian herbal, aromatic, and medicinal plants grow in rain-fed conditions and are highly dependent on environmental factors. Spontaneous MAPs represent 90 percent of the entire production. About 800,000 hectares of forestland in the north and 4,700,000 hectares of rangeland in southern Tunisia are suitable for spontaneous production. Almost 80 percent of forest cover is rosemary and myrtle. Forests are distributed mainly in the North-West region (44 percent), the North East (27 percent) and the Central West (25 percent) (DGF 2010)⁷⁴.

Planted varieties represent 10 percent of total production. An estimated 20 kinds of plants occupy an area of almost 4,550 hectares. The area dedicated to medicinal plants occupies 1,396 hectares. Bigarade, jojoba, rose bush, geranium, and mint take up 85 percent of the area. The main aromatic plants are caraway seed and coriander, with 80 percent of the area dedicated to aromatic plants.

MAPs are a potential source of income for population in lagging regions, especially women, who are involved in most of the fieldwork, processing, and marketing of medicinal plants (Neffati, Belgacem, and Mourid 2008). The sector provides about 250,000 working days per year, which corresponds to 0.9 percent of the working days provided by the agricultural sector (APIA 2013).

However, a dozen of well-coordinated firms dominate the MAPs sector in Tunisia⁷⁵. These firms bid for and exploit the entirety of the available forestall land each year and subcontract part of the collection and distillation in the field to “foremen,” who then informally recruit seasonal and low-waged local laborers and invoice their work to the firm per liter of distilled essential oil. Some startups have tried to enter the market, but their investments are hindered by the limited access to forest resources. The current code is also particularly unfavorable to Agricultural Development Groups (Groupements de Développement Agricole, or GDA). GDAs cannot participate in public auctions. Article 38 of the Forestry

⁷³ Mohamed Neffati, Hanen Najjaa, Ákos Máthé, *Medicinal and Aromatic Plants of the World – Africa*, 2017

⁷⁴ <http://www.apia.com.tn/medias/files/Etude-de-amelioration-Qualite-et-positionnement-des-Plantes-Aromatiques-et-Medicinales.pdf>

⁷⁵ The main Tunisian companies are Biga Flor, Sentolia, Botanica, Shedan, Carthago Essences, Herbes de Tunisie, Vergers de Tunisie, Stelfair, Utica Flora, Ste Marouani, Youssef Ben Brahim, Nabil Ben Belkacem, and Jamel Yaakoubi.

Code confirms the right of forestry peoples to use forest resources, allowing them to use certain forest products free of charge to support their families, but it does not allow them to carry out that activity for commercial purposes. Organized GDAs, like the GDA from Tbaynia to Aïn Drahem, are limited to a “craft” operation. Comanagement agreements between the forestry administration and organized forest populations (GDA-SMSA) are being tested under a World Bank–financed project⁷⁶ which will promote sustainable management and better use of forest products.

BOX 12: THE EXPLOITATION OF MAPS IN FOREST AREAS

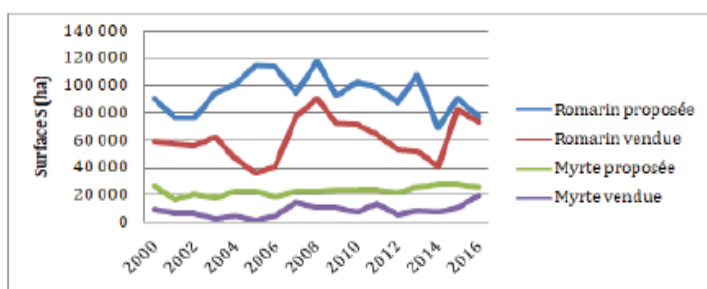
Law No 88-20 of April 15, 1988, which recast the Forestry Code and its implementing texts, established the general rules for the exploitation and marketing of forest products as well as spontaneous aromatic and medicinal plants. Article 18 of the Forestry Code stipulates: “The alienation of products of any kind from the State forests may be carried out only by public tender, announced at least fifteen days in advance by press. However, for duly justified reasons or in case of urgency or inability to proceed with the sale by public tender, direct sales may be made. The exploitation of MAPs layers in the forest area requires an authorization issued by the Régie d'Exploitation des Forêts (REF) under the Ministry of Agriculture, Water Resources and Fisheries.” The choice of the layers to exploit is determined based on an exploitation plan that sets an average rotation of three years. This allows the regeneration of the aquifers which are often overexploited. The percentage of exploitation of the layers varies according to the species. The highest demand yield rosemary plots with a sales rate of 94 percent of the plots put out to tender in 2015. They are followed by *lentisque* (mastic) with a rate of 70 percent. Myrtle ranks third with a rate of 29 percent (ONAGRI 2017).

The evolution of the sale of exploitation rights from 2001 to 2016 shows the following trends:

- -An increase occurred in the area of rosemary’s layers offered for sale until 2008, then a downward trend. This decline can be explained by the low productivity of some slopes subject to the effects of drought.
- The rate of sale of rosemary layers has been around 60–70 percent, except in recent years when demand was very strong. In general, sold rights were also down except for 2015-2016.
- A quasi stagnation of the rights offered for sale for myrtle occurred except for the past years, when it recorded a gentle upward slope from 2007 of plants sold for harvesting. In 2016, the proposed (available) and sold land approached around 100,000 hectares (figure 39).

Figure 39

**Evolution of forest land’s exploitation of rights
(Rosemary and Myrtle)**



Source: Régie d'Exploitation Forestière (REF) 2017 as cited in the article of ONAGRI (Observatoire National de l'Agriculture, 2017)

Note: Romarin proposée = rosemary proposed; Romarin vendue = rosemary sold; Myrte proposée = myrtle proposed; Myrte vendue = myrtle sold.

⁷⁶ Integrated Landscape Management in Lagging Regions Project, P151030, 2017.

Tunisia's total exports of MAPs are estimated at US\$40.2 million, with a limited amount of diversification and level of transformation or value added. Tunisia exports MAPs in three forms: (i) essential oils and floral waters, (ii) fresh or dried plants or parts of plants (PPPs), and (iii) condiments.

The total value of exports of essential oils was US\$21,4 million in 2017, with rosemary, orange, and neroli on top of the list.⁷⁷ These products are exported mainly to France (64,7 percent), Spain (8,1 percent) and the United States (7,8 percent).

Table 20

Main importers of Tunisian essential oils, 2013-2017

(USD thousands)

Importers	Exported value in 2013	Exported value in 2014	Exported value in 2015	Exported value in 2016	Exported value in 2017
World	10,452	15,922	14,854	15,519	21,464
France	7,670	10,670	10,202	10,518	13,887
Spain	465	1,206	835	887	1,735
United States of America	358	717	870	1,089	1,682
Germany	829	1,166	964	1,193	1,509
United Kingdom	526	1,134	1,226	792	1,148
Switzerland	96	147	186	511	502
Belgium	0	143	45	0	198
Hungary	7	77	35	1	142
Canada	12	25	7	42	101
Bangladesh	0	0	0	0	91

Source: ITC, Trade Map, 2019

The main essential oils produced in Tunisia are neroli, rosemary, white wormwood, marjoram, and citrus essences. The essential oil of rosemary is the most produced oil from spontaneous MAPs. However, according to APIA, there is a downward trend in the production at the national level. This tendency is due to the deterioration of the layers of rosemary put out for tender. The 13 distillation companies that dominate the market are largely located in Greater Tunis and along the coast from Cap Bon to Sfax. Most of these companies are commercially linked to at least one major international company,⁷⁸ to which they mainly export essential oils in bulk.

PPP exports from Tunisia were estimated at US\$3.6 million in 2017 and went mainly to France, Italy and Spain (Table 21). Most exported PPPs were used in medicine (87 percent) INS 2018).

Table 21

Importing markets for Tunisian plants and parts of plants 2013-2017

⁷⁷ See also annex F.

⁷⁸ The chief international companies in the sector of perfumes and aromas are Givaudan, Firmenich, IFF (International Flavors & Fragrances), Symrise, Takasago, Mane SA, Frutarom, Sensient Flavors, Robertet SA, Huabao International, and T. Hasegawa (Leffingwell & Associates 2016).

US\$, thousands)

Importers	Exported value in 2013	Exported value in 2014	Exported value in 2015	Exported value in 2016	Exported value in 2017
World	2,964	2,780	2,130	2,570	3,646
France	461	467	718	769	793
Italy	1,842	1,261	246	214	638
Spain	214	235	307	516	585
Slovenia	177	202	304	239	356
United States of America	65	39	62	72	315
Germany	64	280	79	210	276
Egypt	0	128	101	112	152
Switzerland	0	0	0	140	134
Netherlands	2	39	28	53	100
Cayman Islands	32	0	35	151	90

Source: Trade Map, ITC calculations based on the UN Comtrade database and ITC statistics, 2019

Dried rosemary leaves are the most produced PPPs. The production addresses a continuously strong demand by international markets. The values of fresh or dried MAPs production are difficult to determine because of the lack of national statistics. That said, according to APIA, dried MAPs account for almost all exports. Production of fresh MAPs is linked to various constraints, the lack of efficient and affordable cold logistics in particular.

Export of condiments amounted to US\$2.5 million in 2017, mostly to France (35 percent), Libya (23 percent), and Algeria (15 percent). The most exported condiments were harissa (65 percent) and caraway (19). Organic MAPs have experienced significant growth in exports recently, from US\$1.56 million in 2014 to US\$2,43 million in 2017, with France being the main importer (74.5 percent) (INS 2018).

Among condiments, coriander is the most produced (3,000 tons in 2011). The market for spices and condiments in Tunisia faces a major problem due to the marketing of expired or counterfeit products. Spices are often poorly preserved and exposed to sun, air, and dust. Moreover, counterfeiters mix spices with much cheaper products to expand the quantity.

ANNEX F: TUNISIA EXPORT OF ESSENTIAL OIL, CONCRETE OR ABSOLUTE (QUANTITY: KG)

Code (NSH10)	Libellée	2015	2016	2017
3301121001	Néroli, non deterpenees	5,011	2,728	883
3301121009	Autres huiles essentielles d'orange, non deterpenees	1,692	1,548	635
3301129001	Neroli, deterpenees	245	248	2,189
3301129009	Autres huiles essentielles d'oranges, deterpenees	2,002	2,196	7,926
3301192001	Huiles essentielles de bergamote, non deterpenees *		694	
3301192009	Huiles essentielles d'autres argumes, non deterpenees *	2,749	2,587	2,914
3301198009	Huiles essentielles d'autres agrumes, deterpenees *	307	433	508
3301251000	Huiles essentielles d'autres menthes, non deterpenees			250
3301294110	Huiles essentielles de geranium, non deterpenees *	1,131	4	
3301294191	Huiles essentielles de jasmin, non deterpenees *	4		
3301294192	Huiles essentielles de lavande ou de lavandin, non deterpenees *		374	
3301294194	Huiles essentielles de romarin, non deterpenees *	31,256	30,775	46,650
3301294195	Huiles essentielles de myrte, non deterpenees *	2,131	5,470	2,841
3301294196	Huiles essentielles d'armoise blanche, non deterpenees *	242		
3301294199	Autres huiles essentielles, non deterpenees *	2,551	6,546	5,818
3301297900	Huiles essentielles de lavande ou de lavandin, deterpenees *		84	
3301299111	Huiles essentielles de romarin, deterpenees	86,956	63,215	98,810
3301299112	Huiles essentielles de myrte, deterpenees	2,391	2,068	2,980
3301299190	Autres huiles essentielles, déterpénées	3,881	27,279	47,718
3301300000	Resinoïdes	3,960	24,036	
3301901000	Sous-produits terpéniques résiduels de la déterpénation des huiles essentielles		87	400
3301903009	Autres oleoresines d'extraction *	960	775	3,524

3301909091	Eaux de fleurs d'oranger	143,500	133,959	189,912
3301909092	Eaux de fleurs de rosier	25,976	15,028	36,406
	Autres distillées aromatiques et solutions aqueuses			
3301909099	d'huiles essentielles	11,701	471	2,282
Total		328,646	320,605	452,646

Source: Institut des statistiques Tunisie (2018)

Note: * = Non diterpenees = Terpeneless

Autres oleoresins d'extraction = Additional oleoresins of extraction

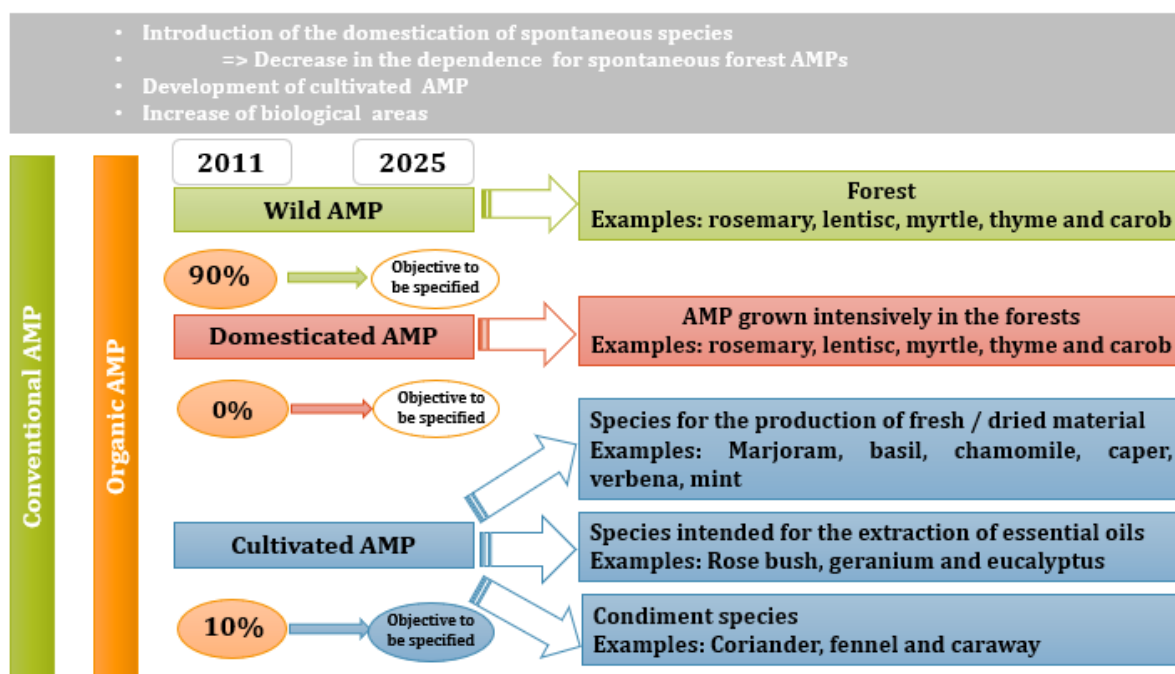
ANNEX G: A STRATEGY FOR MAPs

Figure 38 is a schematic representation of the strategic direction that should target the most attractive segments for each MAP. The figure was developed in consultation with the APIA report and was updated following meetings with stakeholders. The proposed action plan was based on the analysis of rosemary, as well as those performed on myrtle, lentisk, rose, verbena, fennel, coriander and marjoram. These analyzes showed similarities both in the structure of the sector and in value chain elements, except that the cultivated MAPs sector is not constrained by access to forest resources.

The proposed strategic direction for the MAPs sector is based on a combination of optimization of existing spontaneous MAP layers, introduction of the domestication of traditionally spontaneous species to reduce the dependence of spontaneous MAP layers, development of MAP culture and accentuation of certified organic surfaces. Following is the mapping of the new strategic direction which must also be based on the targeting of the most attractive segments for each MAP.

Figure 40

Strategic directions for MAPs sector



Source: Autors, based on APIA 2013 report, updated after meetings with stakeholders

The study on improving the quality and positioning of MAPs (APIA 2013) confirmed the potential for MAPs cultivated at 15,000 hectares with a 5-year program of 6,000 hectares of MAPs between spontaneous MAP culture (including rosemary) and the MAP culture according to the pedoclimatic specificities of the regions. The action plan proposed based on this new strategic orientation is as follows:

Figure 41

Action Plan for the MAPs sector

Axes stratégiques de développement de la CV des PAM dans les régions du Nord-Ouest et du Centre-Ouest		
1	Réforme du Code des Forêts / Gestion du territoire intégrée et concertée	Cet axe propose l'amélioration de l'accès aux ressources forestières, le renforcement des capacités des parties prenantes dans le domaine de la cogestion et la régénération des espaces forestiers dégradés/accidentés par des PAM spontanées à fort potentiel de marché
2	Compréhension et accès aux marchés stratégiques	Cet axe propose l'organisation de voyages de références, un benchmarking avec des succès stories de PAM, l'amélioration de la visibilité des PAM tunisiens à travers la participation au <i>Food Ingredients Global 2017 à Frankfurt en Allemagne</i> , l'amélioration des connaissances sur les exigences du marché international, l'appui à la commercialisation via les VMP, la formation en marketing spécialisé en PAM et la mise en place de showrooms et de points de vente
3	Mise à niveau de la transformation & de l'innovation	Les actions proposées pour cet axe portent sur la création d'un label PAM tunisiennes, l'appui à la mise aux normes internationales, l'intégration d'un service lié à la chaîne du froid pour les segments porteurs, l'appui à la mise en place d'unités pilotes de transformation au niveau des régions, ainsi que la formation des entreprises (GDA – SMSA – Micro-entreprises – PME) et des formateurs.
4	Domestication des PAM spontanées et plantation des PAM cultivées	Cet axe comporte une action majeure relative à l'appui au développement de la plantation des PAM domestiquées en intensif, l'appui à la mise en place de pépinières spécialisées dans les PAM spontanées à domestiquer et les PAM cultivées, la formation et la vulgarisation sur les techniques culturales et la rentabilité de ces cultures, l'apprentissage des techniques de l'agriculture biologique.
5	Coordination des producteurs et collaboration avec les industriels	Les actions proposées portent sur l'organisation des producteurs en GDA et SMSA, l'appui à la mise en réseau des producteurs PAM au Nord-Ouest et au Centre-Ouest en connexion avec les centres de recherches appliqués, ainsi que l'appui à l'élaboration de contrat de culture entre les producteurs de PAM et les industriels
6	Mécanismes de financement appropriés	Les actions proposées pour le financement portent essentiellement sur la garantie des prêts pour le fonds de roulement et pour l'investissement, le financement de l'innovation, ainsi que le relais avec les banques futures partenaires des projets et la formation des porteurs de projets sur la préparation des dossiers de prêts.

Source: Autors, based on APIA 2013 report, updated after meetings with stakeholders

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