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OLIVE MARKET ANALYSIS IN NINEVEH PLAINS, IRAQ

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ABOUT LASER PULSE

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LASER PULSE collaborates with USAID missions, bureaus, independent offices, and other local stakeholders to identify research needs for critical development challenges and funds and strengthens the capacity of researcher-practitioner teams to co-design solutions that translate into policy and practice.

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ACRONYMS

ACV	Annual Contract Value
FAO	Food and Agriculture Organization
IS	Islamic State
LE	Number of accounts in large enterprises
MM	Number of accounts in mid-markets
NGO	Non-governmental organization
SAM	Serviceable Available Market
SMB	Number of accounts in small and medium-sized businesses
UoD	University of Duhok
USDA	United States Department of Agriculture

1. Introduction

Olives are a staple crop in the Nineveh Plains, a region in northern Iraq, and have greatly contributed to the region's economy for generations. In addition to their nutritional and agricultural value, olive trees in this region are recognized as a symbol of peace and identity, holding a distinct position within the economy and social life of its inhabitants (Al-Sanjare, 2017a). Olive production in Nineveh Plains serves as a common small-scale livelihood alternative, presenting important opportunities for local market expansion and substantial scope for enhancing the livelihoods of farmers. Despite its importance to the culture, the environment, and the economy, olive production in this region has faced major challenges.

The olive production has been neglected for many years in Northern Iraq, and work to improve its cultivation halted because of politics and the Islamic State (IS) occupation. Between 2014 and 2017, the IS occupation and the subsequent military campaign resulted in a significant loss of life and displacement for Iraqis. The IS specifically targeted minority communities residing in Nineveh Plains, including Christians, Yazidis, Shabaks, Turkmen, and Kaka'i, who suffered extremely and are still in the process of recovery. Communities were executed, enslaved, or forcibly converted to IS's radical form of Sunni Islam. Thousands of individuals were killed, while millions were forced to leave their homes; however, the destructive consequences extended beyond the loss of human lives. The regional livelihoods, primarily dependent on farming and animal husbandry, were severely affected. The annihilation caused by the IS targeted lives and historical, religious, and cultural heritage sites. This led to a deep spiritual loss and estrangement within the Nineveh Plains communities. Furthermore, the IS sabotaged irrigation wells set orchards ablaze, looted livestock and machinery, destroyed and stole essential power lines, and placed landmines in agricultural areas. The destruction of already scarce water sources had a notably adverse effect on agriculture, including olive production (Amnesty International, 2018).

The cultivation of the olive tree is an ancient tradition in the Mediterranean region (Sofa et al., 2008), with great importance in the economy and culture of this area (Perpetuini et al., 2020). To illustrate, the olive culture has been the livelihood of growers for generations. Appropriately adapted to arid conditions, olive trees stand out as a distinguished fruit species for oil production (Mili & Bouhaddane, 2021). While olives processed into edible oil have dominated olive production for many years, the demand for table olives for various purposes, such as pickles and olive paste, is growing worldwide. Due to its nutritional and cultural value, it is expected that this trend will positively impact the market in the long term (Iofrida et al., 2020).

The world's principal olive producers (both olive oil and table olives) are in Europe, mainly due to their intensive cultivation practices (FAOSTAT, 2023). Olive agriculture in European countries is mostly mechanized, leading to substantial reductions in production costs and increases in productivity and profitability (Kay et al., 2019). Leveraging economies of scale, European olive farms operate high-density orchards, some genetically modified for increased yields and oil conversion. For example, Spain produced 8,256 thousand tons of olive in 2021, leading the world's olive production since 2017. In 2021, olive production in Portugal stood out for the surprising jump from average production of 822 thousand tons recorded in the years 2017 to 2020 to 1,376 k tons in 2021, after adopting the cultivation of olive trees in a super-intensive regime. This made Portugal rank among the five largest olive producers in 2021 (FAOSTAT, 2023). Beyond Spain and Portugal, other countries such as Greece, Italy, Turkey, Morocco, and Tunisia also shine as prominent olive producers on a global scale. Data from the FAOSTAT (2023) report the top world producers of olives in 2017 and 2021 (Table 1).

Table 1: Major olive producers in the world

Year	Global production (tons)	Global ranking	Country	Production (tons)	World market share
2017	21,364,905.19	1st	Spain	6,549,499.00	30.66%
		2nd	Greece	2,837,778.00	13.28%
		3rd	Italy	2,597,974.00	12.16%
		4th	Türkiye	2,100,000.00	9.83%
		5th	Egypt	1,094,724.00	5.12%
		6th	Morocco	1,039,116.84	4.86%
		7th	Portugal	876,215.00	4.10%
		30th	Iraq	10,203.00	0.05%
2021	20,433,938.71	1st	Spain	8,256,550.00	40.41%
		2nd	Italy	2,270,630.00	11.11%
		3rd	Türkiye	1,738,680.00	8.51%
		4th	Morocco	1,590,504.00	7.78%
		5th	Portugal	1,375,750.00	6.73%
		6th	Egypt	976,062.76	4.78%
		7th	Algeria	704,619.00	3.45%
		23rd	Iraq	33,314.00	0.16%

Source: FAOSTAT (2023) at <https://www.fao.org/faostat/en/#data/QCL>.

Although a larger part of olive production is concentrated in European countries, the olive culture plays an important role in other nations. In Iraq, olive production holds an essential contribution to the national economy in terms of income and employment, as well as to the country's cultural heritage (al Hairy et al., 2019). Ranked 23rd worldwide in 2021 (Table 1), Iraq registered an olive production of 33,314 tons, slightly lower from the previous year, when production was 33,912 tons. Yet, production has tripled since IS occupation in 2017 (FAOSTAT, 2023), increasing from 10,203 tons to 33,314 tons in 4 years (Figure 1).

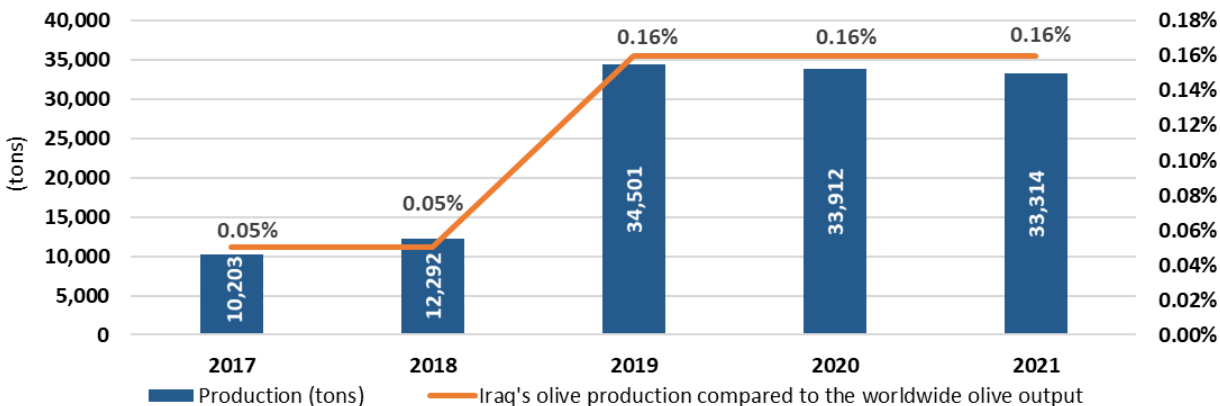


Figure 1: Iraq's olive production and comparison to the worldwide olive output from 2017 to 2021

One of the most important factors leveraging the recent olive market growth in Iraq is the assistance from international organizations, such as the World Food Programme (WFP). To illustrate, The United Nations, through the WFP, has contributed to the planting of olive trees, organized training on agronomic and value-added practices, and supported the acquisition of olive presses. Yet, the inadequately developed national infrastructure and the need for substantial governmental support hinder the expansion of Iraq's olive market, especially in the Nineveh Plains, a region heavily devastated by IS. The loss of trust in sharing operational information following the IS occupation, along with a lack of statistical data and information on olive production and olive products marketing, further challenge potential improvement initiatives. External factors, including the Russia-Ukraine conflict, escalating inflation, and high energy costs, pose additional threats to market growth. Consequently, olive farmers in the Nineveh Plains endure challenging working conditions due to the deterioration of the national power grid, resulting in limited daily energy hours. Moreover, the absence of an efficient irrigation system leaves olive farmers vulnerable during droughts.

The current situation makes it imperative to support the revival and care of olive groves in the Nineveh Plains. The first step in designing solutions to overcome current challenges is to conduct a market analysis. A market analysis provides farmers, processors, and retailers with measurable market trends, size and segment markets, forecast demand, and design products and value-added strategies. A market analysis also sheds light on major opportunities and barriers and aids in the design and development of incentives and support from government and international organizations. With the aim of supporting olive farmers affected by the IS in the Nineveh Plains and contributing to the cultural preservation of olives in this region, the overall goal of the study is to describe the existing olive supply chain in the Nineveh Plains in Iraq. To address this, we 1) broadly describe the area of olive production in the Nineveh Plains, 2) identify the olive products and varieties currently in the marketplace, 3) characterize the market demand and competition, as well as the price points of commonly grown and consumed olive products, and 4) outline the current olive market channels. Lastly, in the conclusions and discussion section, we provide general consumer considerations and potential strategies to develop the olive supply chain in the Nineveh Plains in Iraq.

Acquiring a deeper understanding of the olive supply chain in Nineveh Plains can help the government, international organizations, and industry stakeholders concentrate efforts on resolving key market

supply issues, thereby reducing Iraq's dependence on imported olive products. These findings can help olive farmers, processors, wholesalers, and retailers enhance productivity and profitability, as well as have spillover effects on rural and urban communities through the generation of employment and access to local foods.

2. Methodology

2.1 Study Area

The market analysis took place in the Nineveh Plains, a region in Iraq's Nineveh Governorate. The Nineveh Plains are situated northeast of Mosul and about 400 kilometers northwest of Baghdad (Figure 2). The Nineveh Governorate is one of 19 provinces of Iraq, comprising an area of 51,740 square kilometers. As seen in Figure 2, the Tigris River divides Nineveh Governorate geographically and demographically. The area to the right of the river is the Nineveh Plains and is estimated to cover 5,000 square kilometers, and includes The Bashiqa district, the Bahazani sub-district, the Al-Fadhiliya sub-district, the Nineveh Governorate, the Erbil Governorate, the Duhok Governorate, the Sulaymaniyah Governorate, and the Southern governorates.



Figure 2: Nineveh Governorate map with districts and sub-districts

2.2 Study Approach

The number of customers in the study area was determined by the market research, including surveying sales levels of different businesses in the supply chain, identifying opportunities and challenges in marketing, and assessing the marketing process between producers, wholesalers, processors, and retailers. Thus, the team developed survey and interview tools that were delivered by researchers from the University of Duhok (UoD). They segmented consumers based on geography and consumer demographics (e.g., ethnicity, age, etc.), psychographics (e.g., needs, motivation), and behavioral (e.g., type of markets, price sensitivity) characteristics.

[Appendix A](#) shows the segmentation variables that were available to measure the population in Nineveh Plains, according to Nineveh Plains Kurdistan Regional Statistics Office (KRSO). Lastly, due to the lack of available statistical data and stakeholders' reluctance to share information about their demand and

supply due to a widespread loss of confidence following the IS occupation, we also considered cost-effectiveness and simplicity of segmenting potential customers, profitability potential of market segments, potential for marketing strategies to reach particular segments, divergence across different market segments.

2.3 Data collection

This study collected data from olive consumers and stakeholders of the olive supply chain in the Nineveh Plains from August to December 2022. Consumers' data were collected through a survey questionnaire and interviews with 250 olive consumers ([Appendix 2](#)). Participants were 18 years or older, either fully or partially responsible for grocery shopping for the family, and self-reported consumers of olives. 67.2% were male, 28.9% were female, and 3.9% declined to share their gender. The questionnaire, developed by researchers from the UoD, was divided into four sections that assessed consumer characteristics in terms of demographic, psychographic, geographic, and behavioral aspects. For the market segment data collection, researchers conducted in-person surveys with consumers, growers, intermediaries, and processors in the olive supply chain in the Nineveh Plains.

3. Results and Discussion

3.1 Olive Production in the Nineveh Plains

In the Nineveh Plains, olive production has recovered gradually since the IS occupation and currently meets an estimated 30% of local demand. The remaining 70% of the demand is met by imports, mainly from Syria and Iran, among others. Based on primary data collected and government public data, this study identified 513 olive growers in the Nineveh Plains, who had an average of 1.58 hectares. The researchers estimated that farmers had approximately 380,000 olive trees in total, with approximately 360,000 trees (or about 95%) currently producing olives. In 2022, the number of officially registered olive trees in the General Directory of Agriculture was 270,509, which leaves a considerable number of trees unregistered. Researchers noticed many growers were unwilling to register their orchard trees, which may be explained by the impact of the IS occupation in the region.

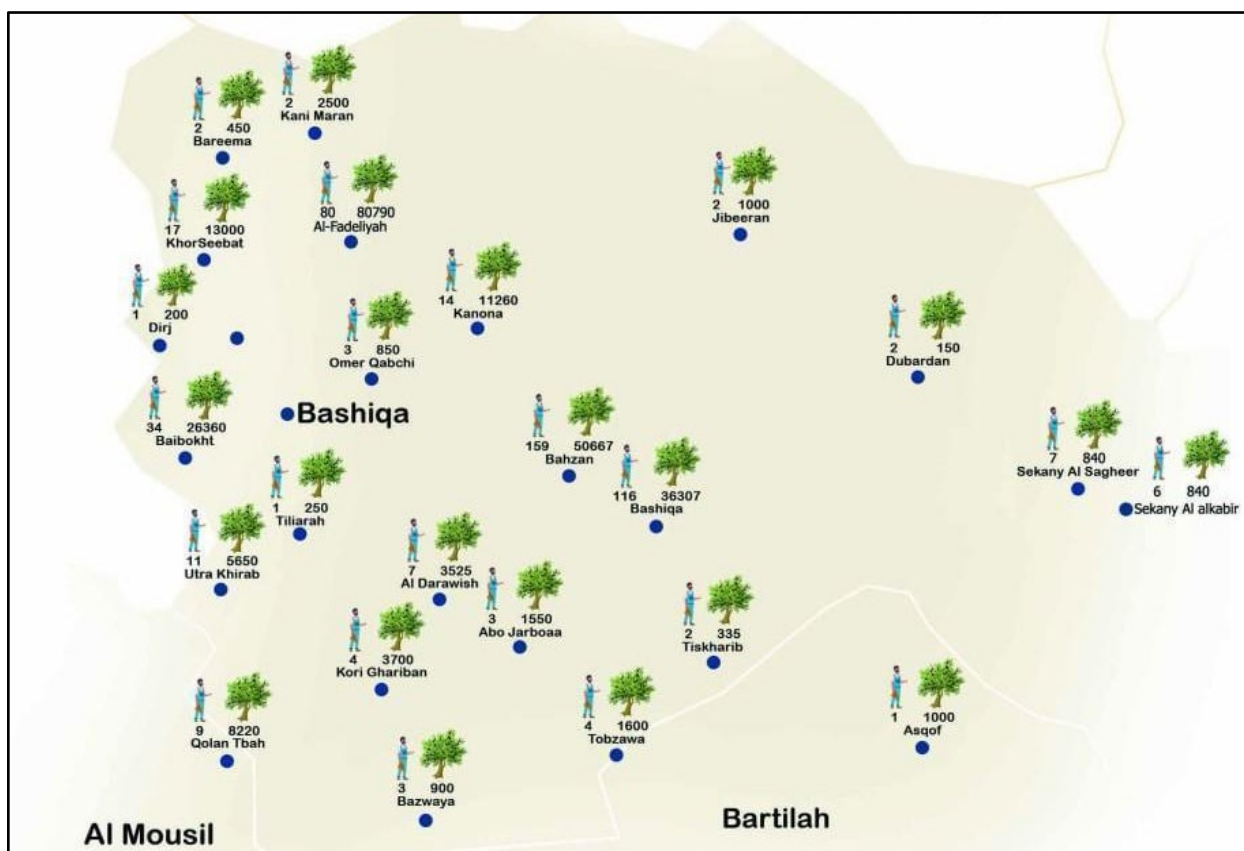


Figure 3: Number of farmers and number of olive trees in Bashiqa

Data collection focused on Bashiqa, the area with the highest concentration of olive growers and trees in the Nineveh Plains. The expectation is that general trends found in Bashiqa can also be applied to other districts in the Nineveh Plains. Bashiqa is a sub-district of Mosul, with 489 olive growers and 250,944 olive trees, as shown in Figure 3. The olive trees in Bashiqa cover an estimated area of 492.62 hectares, accounting for nearly 61% of the total cultivation area in the Nineveh Plains (810.54 hectares) (Table 2). Bashiqa is home to 140,000 residents who identify as Shabak, Christians, Yazidis, Kurds, and Arabs, representing the most populous area in the Nineveh Plains. Olive farming in Bashiqa is considered one of the most significant sources of income for its residents. There are many varieties of olives in

Bashiqā, including the Local Bashiqi, Dehkani, Dakka Lal, Khastawi, Spanish, Greek, Sorani, Shamali, Khudairi, Nepali, and others. These varieties are generally recognized as suitable for oil extraction and can be preserved in water and salt for over seven years.

Table 2: Area of olive tree plantation in different regions in Iraq

Region	Total area of olive trees plantation
Iraq	9,721.00 hectare
Nineveh Plains	810.54 hectare
Bashiqā	492.62 hectare

Source: Data collected by the researchers of the UoD.

Despite the unavailability of statistical data from official sources, in 2021, the General Directorate of Agriculture in Bashiqā estimated the raw olive production of 6,852 tons in the Nineveh Plains, equivalent to 21% of the total olive production in Iraq (33,314 tons) in the same year. Among the different olive production varieties, 6,354 tons consisted of local Bashiqi, 396 tons were Syrian, 125 tons were Khastawi, and 4 tons were Spanish varieties, as shown in Figure 4.

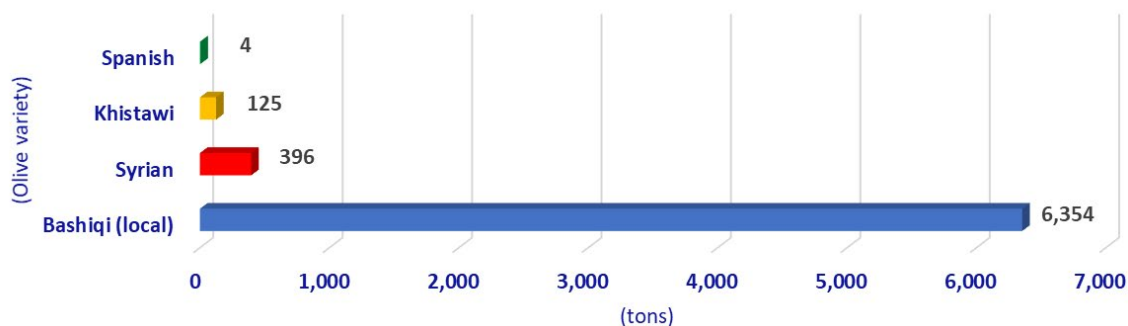


Figure 4: Olive varieties and production in Nineveh Plains

3.2 Olive Products

In the Nineveh Plains, the main olive products sold by olive growers are raw olives, olive in brine, and olive oil (virgin, extra virgin, and ordinary virgin oil). A lower volume of sales includes pickles and olive soap. Our data suggests that olives can be sold in two ways. First, producers sell the olives right after harvesting without processing (commonly to sell raw olives). Alternatively, producers sell the olive oil, brine, or in some cases pickles after processing them on their own. When looking at the customers, olive producers sell olives, pickles, and olive oil to final customers (or end-users), intermediaries, or processors (the latter tends to add value or repackage it and sell it under a brand name). The vast majority of Nineveh olive products (80%) are destined for the production of table olives and related products (such as pickles and olive paste). In contrast, only 20% of olives are sold to mills for oil extraction. This is mainly due to the lower prices paid by processors for the local olives compared to the imported types. Based on our data, we found that, on average, 15% of the raw olives are sold directly to processors to be milled or pressed, 70% to wholesalers, and 15% to retailers. The processed olive products can be sold to wholesalers and retailers, and some of the processors and packers may be considered wholesalers depending on the size of their operation. In the last step of the supply chain, either restaurants or retail brands sell the products to consumers.

The olive oil sector in Iraq is still developing and currently lacks access to facilities and equipment to increase olive production. Likewise, the Iraqi olive variety was perceived as not well suited for oil production, due to the low oil extraction rate (reported as between 90 and 120 liters per ton), which increases the olive oil price. Among the olive varieties that are produced in Nineveh Plains, the best variety for oil production is the local Bashiqa as it has 12-15% oil content.

Farmers in the study reported three types of olive oil products in Nineveh Plains (extra virgin olive oil, virgin olive oil, and ordinary virgin olive oil). One of the main differences between the three olive oil products is the level of acidity (see Table 3), which can be used to differentiate olive oil and advertise to distinct market segments. Olive growers in Nineveh Plains reported that the less the olive oil is handled, and the closer it is to its natural state, the better the oil. In 2021, the Bashiqa Agricultural Division office reported that a total of 9,000 liters of olive oil were produced in Nineveh Plains.

Table 3: Types of olive oils and acidity limits

Types of olive oil	Acidity limits
Extra Virgin Olive Oil (superior taste, flavor, aroma)	Maximum of free acidity of 0.8% (ie. 0.8 grams/ 100 grams), expressed as oleic acid
Virgin Olive Oil (reasonably good taste, flavor and aroma)	Maximum of free acidity of 2% (2 grams/ 100 grams)
Ordinary Virgin Oil	Maximum of free acidity of 3.3% (3.3 grams/ 100 grams)

Source: Elaborated by the UoD researchers

The data highlights two locally-used ways to produce olive oil, manufactured at an industrial level and traditionally processed. The traditional olive oil extraction process consists of three phases. The first phase is milling, in which ripe, clean, and healthy olives are broken by grinding them in stone mills, either manual or animal-drawn until they are converted into a paste. Then the oily paste is placed on a porous disc of esparto fiber, stacked one on top of the other, forming a pile. When the pile has the necessary height, the press is activated, and the liquid part of the paste (oil and water) is released by pressure, from the trapped solid residue. The last phase of traditional oil production consists of separating the oil from the vegetation water by decanting. The difference in density of the oil must be obtained by pressing, thus water and some residual solids are deposited at the bottom of a decanting tank while the oil remains at the top. After a period of rest, the oil can be extracted from the upper part of the tank, while the vegetation water, together with some solid microparticles, remains at the bottom. Olive growers reported that the traditional process involves more labor and higher costs; yet, this type of traditional olive oil tends to be preferred by local consumers and therefore commands a higher price premium.

The industrialized olive production in Nineveh Plains is a complex and intricate process involving multiple steps. First, the olives are collected from the tree and then taken to a factory for processing. Once at the factory, the olives are sorted, cleaned, and put into a machine to extract the oil. This process requires skilled labor as well as the use of specialized equipment such as presses and centrifuges. The extracted oil is then filtered to remove impurities and transferred to containers for storage. Next, the oil is packed and ready to be shipped to domestic markets, particularly Mosul City, Erbil City, Dohuk City, and other southern cities. After harvesting, factories transport the olives and carry out post-harvest treatments such as cleaning. Sorting is followed by adding the olives to barrels filled with water, then adding sea salt without iodine at a rate of 10% of the weight of the olives.

The study's findings suggest that a significant advantage of Iraqi olive oil (Photo 1) is that local consumers consider it one of the finest olive oils due to the combination of modern technologies and traditional practices passed down through generations. However, respondents reported that Iraqi olive oil tends to be more expensive than imported olive oil, which may be due to higher production costs. The label of origin, "Made in Iraq" aims to differentiate Iraqi olive oil from imported oils and is currently sold in the market as a niche product at a premium price. Because Iraqi olive oil does not compare favorably to imports in terms of price, this niche strategy may be failing because it does not leverage a significant demand for the product. This is especially true as a large portion of respondents reported that locals can't afford Iraqi olive oil, and price sensitivity is driving them to purchase imported olive oil.



Photo 1: Local industrialized olive oil, by Dr. Asaad Karam

The study findings also suggest that the lack of production standards is impacting the quality of Iraqi olive oil. For example, issues related to olives not being processed soon enough after harvest can cause olives to ferment, resulting in acidic olive oil. In addition, we found that a proportion of olive oil processors may be using low-quality olives rejected for table olive standard, which in turn results in poor oil quality. Lastly, research findings indicate frequent cross-contamination between production stages, often due to unclean equipment or poor training for personnel involved in the process.

The data suggests that most olive farmers produced olive oil, but none of them owned industrial olive oil presses. In Bashiqa, the region with the highest concentration of farmers and olive trees in the Nineveh Plains, there are four categories of olive oil processors:

- Private mill or press
- Directorate of Agriculture press
- Municipality mill or press
- NGO-sponsored farmer press

3.3 Olive Market, competitors, suppliers, and price

Regarding consumption of table olives, the data suggests that approximately 60% of olives produced in Nineveh Plains are consumed locally, 20% is consumed by the Kurdistan Region, and 20% in other parts of Iraq. Due to their cultural roots, the Nineveh Plains inhabitants tend to consume more local olive products, as they have used them for generations, not only for consumption but also for ritual and medicinal purposes. To illustrate this, 78% of survey respondents reported consuming olive products for health benefits, 18% consuming for different rituals and cultural purposes, and the remaining 4% consuming for other purposes. The vast majority of consumers reported a preference to consume table olive from the Bashiqi variety (80%) followed by the Khestawi variety (10%), Decl variety (5%), and other varieties preference was minimal (figure 5).

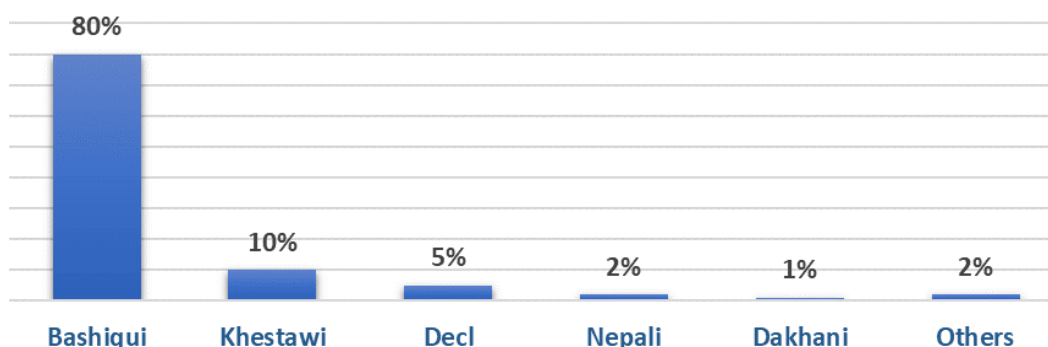


Figure 5: Consumer preference of local varieties for table olives

The study data from consumers in the Nineveh Plains suggests that 53% of consumers purchase, on average, one (1) kilogram of raw olives per week, 20% of them purchase 2 kilograms/week, 9% purchase 3 kilograms/week, and the remaining 18% of consumers purchase more than 3 kilograms of raw olives per week. About 61% of the consumers buy olives once a week, 27% twice a week, and the remaining 12% buy less frequently than once or twice a week. The survey results showed that 40% of respondents are willing to pay up to 2,000 Iraqi Dinars per kilogram of olives (approximately 1.53 USD per kg of olives), 50% would pay 3,000 Iraqi Dinars per kilogram of olives (approximately 2.29 USD per kg of olives), and 10% would pay up to 3,500 Iraqi Dinars for a kilogram of olives (approximately 2.67 USD per kg of olives).

In comparison, secondary data from IndexBox (2022) estimates olive consumption in Iraq from 0.2 kg per person in 2015 to 0.8 kg per person in 2021; which translates into a growing per capita olive

consumption from 393 Iraqi Dinars to 2,100 Iraqi Dinars (approximately 0.30 to 1.60 USD per person) in the same time interval. In addition, IndexBox (2022) reported the Iraq olive market is expecting a compound annual growth rate of 2.1% between 2021 and 2030, while the domestic production of olives is expected to reach 41 thousand tons of olive production by the end of the period.

The study also identified that 87% of the interviewed consumers considered the quality of the product to be the most important attribute when making a purchase, and 13% of them focused on the price. Likewise, at the time of purchase, the main obstacles to purchasing raw olives were lack of product availability (70% of consumers), lack of confidence in local products (10% of consumers), political tensions between the Nineveh Plains and other parts of Iraq (10% of consumers), high prices (5% of consumers), and news about health (5% of consumers). Half of the consumers said that having a good product would be a viable alternative for solving the local olive market's problems. Following that, 20% of consumers recommended attractive packaging, 10% of consumers suggested improved local logistics, another 10% of consumers favored good marketing promotion, while 5% of consumers recommended good customer service and buying directly from farmers as the best approaches to address local olive marketing issues. When asked how they would feel if local olives were unavailable, 15% of consumers said they would feel very bad, because of the cultural attachment to the local product, 40% of consumers mentioned generally feeling bad about the situation, 35% of consumers said they would have a neutral response, while 10% of consumers said they would feel good, as this would allow more foreign products.

Segmenting the olive consumer preferences in Nineveh Plains based on behavioral profiles revealed that table olives are the most consumed product by 65% of consumers, followed by olive oil (23%) and 12% of raw olives. Most consumers buy table olives from retailers (56%), although 30% of consumers reported buying directly from farmers. In addition, 88% of the interviewed consumers consider themselves loyal to local olive products, and more than 85% would recommend local olive products to friends and family. Together, these trends suggest that many local consumers are loyal to local olive producers. The fact that consumers favorably purchase directly from producers makes it imperative for producers to improve the added value of the olive product. In addition, 90% of Nineveh Plains' consumers value olive table quality more than price (10%). These results suggest olive growers need to follow standard procedures and guarantee the quality of the olive product to the consumers. Consumers may belong to the indigenous groups (Christians, Yezidis, Shabaks, Turkmen, and Kaka'i). According to Yezidi leaders, between 400,000 and 500,000 Yezidis live in the two governorates of Nineveh and Duhok. There are fewer than 250,000 Christians in Iraq, with 200,000 residing in the Nineveh plains and Kurdistan Region. Shabaks have existed for centuries in the Nineveh Plains, near Mosul, between the Khazir and Tigris rivers, with 200,000–500,000 people. The Kaka'i, also known as Yarsan or Ahl-e Haqq, are thought to number between 120,000 and 200,000 in Nineveh province. After Arabs and Kurds, Turkmen make up the third largest ethnic group in Iraq. The Turkmen population in Iraq is estimated to be between 600,000 and 2 million. These groups are known to consume local olive products; however, customers from these groups are assumed to be very price sensitive; they tend to buy lower-priced imported products as they cannot afford more expensive local olive products.

Olives and olive products from the Nineveh Plains may also be sold in other districts and sub-districts of the Nineveh Governorate and Iraq; however, data on consumer segments was not collected due to project goals. Alternatively, consumers from the Nineveh Plains may also have access to imported olives coming into Iraq. A review of existing literature suggests that Iraq imports are primarily from Turkey with \$2.29M, equivalent to 42.6% of total volume, Spain with \$1.09M (20.3%), United Arab Emirates with \$931k (17.3%), Lebanon with \$435k (8.09%), and Italy with \$362k equivalent to 6.73% (OEC, 2020).

In our study, interviewees highlighted Iranian olives as a strong competitor. This might be attributed to the proximity of the countries and the olive production capacity of Iran. For example, Iran produced 120,000 tons of olives in 2021 (Financial Tribune, 2021). Iran also has the capacity to manage high-density olive tree plantations (800 to 2,000 trees per hectare) and has access to irrigation and mechanized harvesting are distinct advantages Iran has over Iraq's olive production. On the other hand, Iraq's density of olive trees is low (200 to 400 trees per hectare), and olive producers typically depend on rainwater and manual harvesting (USAID & Inma, 2011). Another relevant insight provided by the interviewees was regarding the Syrian olives. They reported that the import of table olives from Syria affects the local market, as prices of Syrian olives tend to be lower than local table olives.

On the supplier's side, the researchers identified that access to production inputs has been significantly challenging for the olive growers. Among the inputs considered hindrances in olive production, the supply of water, electricity, chemicals, fertilizers, and pesticides stands out. Access to water for olive trees is one of the biggest challenges for olive producers and the challenge is increasing due to the impacts of climate change. The consequences of the water source destruction and the disruption of irrigation wells provoked by the IS occupation were claimed by the interviewees in Nineveh Plains. Olive producers need to dig costly deep wells to access underground water for irrigating the trees. Similarly to water, electricity was also a barrier to olive production according to interviewees. Olive growers reported that electricity for pumps is usually offered by the public sector at subsidized prices but some farmers have to get it from the private sector at premium prices. Although some farmers might have generators, they need to rely on a sporadic power supply, and not all farms in the Nineveh Plains area are connected to electricity. In general, farmers are compelled to work in hot conditions due to the deterioration of national grids, which often provide only a few hours of electricity per day, limiting production expansion.

Considering access to chemical fertilizers and pesticides, olive farmers complained about the difficulty of accessing these inputs and the high acquisition costs. Almost every input necessary for olive production is imported, primarily due to the unavailability of local inputs or their elevated prices, which adversely affect olive production costs. In contrast, labor cost was cited as a relatively inexpensive input due to the high labor supply and unemployment levels in the Nineveh Plains. Olive producers also reported that the government does not provide incentives or support to improve profitability. For instance, product branding and labeling are done by farmers. Consequently, olive oil and table olives are typically sold in unlabeled plastic bags or bottles.

To identify olive prices in the different marketing channels, the researchers characterized the marketing agents according to their attributes and different market levels, as shown in Table 4.

Table 4: Marketing agents at different levels of the olive supply chain in the Nineveh Plains

Producers	Wholesalers	Retailers
Olive farmer: Local growers or agribusinesses that sell olives immediately after harvest or break olives, process them (bulk oil, pickle), and then sell them. Among the most used olive varieties are Baashiqi, Decl, and Nabali.	<p>Intermediaries: Individuals who buy olives from the producers (broken or unbroken) and sell them to other agents.</p> <p>Processors: A business that buys olives (broken or unbroken) and produces pickle olives, processed olives, olive oil, etc.</p> <p>Packaging center: A center that buys broken or unbroken olives and packs them up.</p>	Retailer: Includes all shopkeepers, stores, supermarkets, and even the restaurants that supply Olive and its products to end-consumers.

Source: Developed by the researchers of the UoD.

The study collected olive prices at different value chain levels for different olive varieties. It is important to remember that imports of olives and olive oil from neighboring countries constantly affect demand and prices, as imported products are usually cheaper. The prices in Figure 6 are in Iraqi Dinars for raw olives between September 30 and October 24, 2022. The data was provided by farmers, brokers, wholesalers, and retailers at the farm or marketplaces. That is, no official prices have been recorded by governmental agencies. Lastly, prices may vary due to the flow of Syrian and Iranian olives, which increases or decreases the price according to the local supply and demand.



Figure 6: Olive prices (in Iraqi Dinars) at different nodes of supply for different varieties in Nineveh Plains

Figure 6 illustrates the Decl and Khistawi olive varieties command higher prices for farmers compared to other varieties in Nineveh Plains. Among the listed olives varieties, farmers can expect to have higher

prices for the Decl and Khistawi varieties, ranging from 700-800 Iraqi dinars when selling to intermediaries. For the retailers, the profit margin is higher for the Khistawi olive variety compared to the Decl variety. At the retail level, the Khistawi variety can be sold for 4000-6000 Iraqi dinars, allowing retailers to earn a significant profit margin.

3.4 Olive market channels

Our findings suggest there are 11 types of market channels for olive farmers in the Nineveh region (Figure 6). Of them, three market channels are for raw olives and 8 channels are for olive oil or pickles. The supply chain of raw olives includes farmers selling to intermediaries or directly to consumers, while olive oil or pickles tend to be sold from farmers to consumers, processors, or intermediaries.

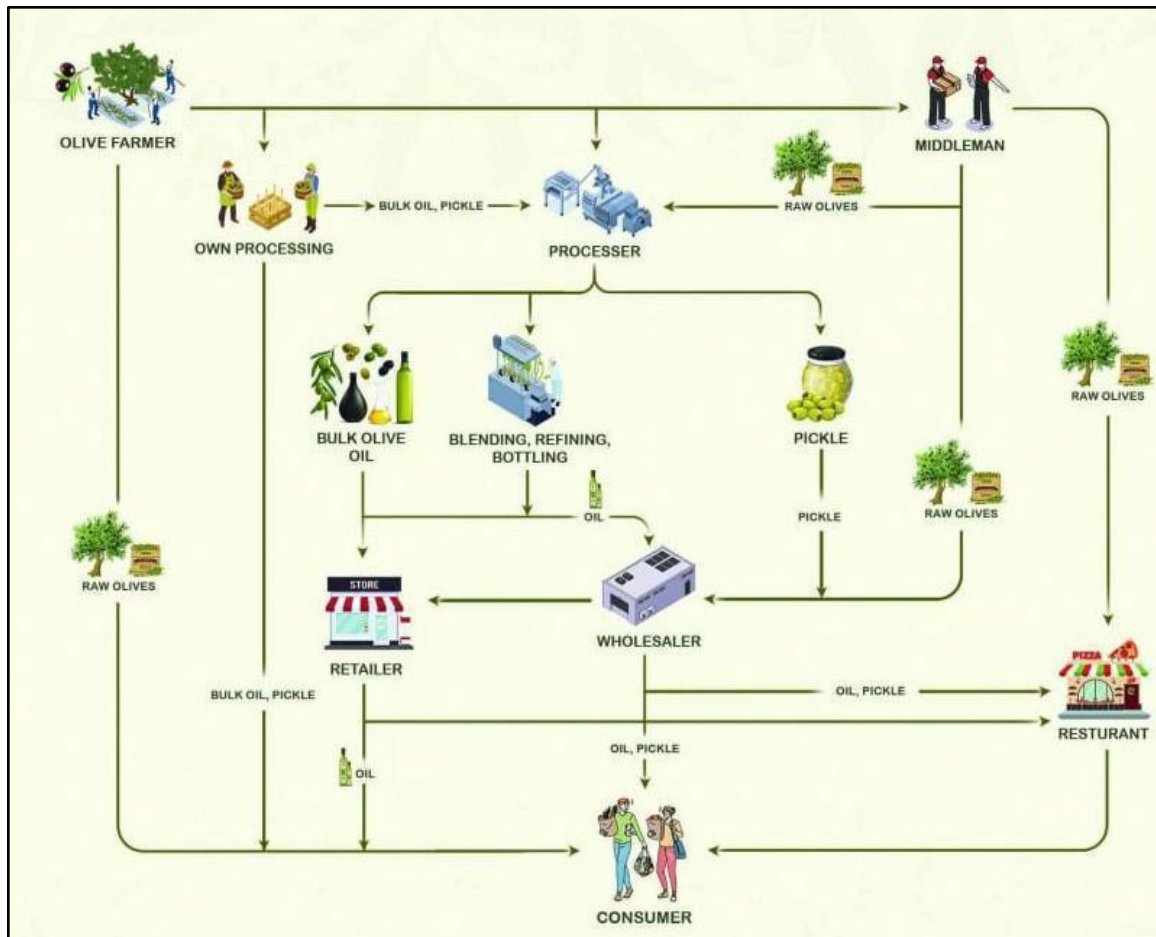


Figure 7: Supplying channels of olive products in Nineveh Plains

Olive Market Channels in the Nineveh region:

Raw olives:

- Channel #1: Producer → Consumer
- Channel #2: Producer → Intermediary → Restaurant → Consumer
- Channel #3: Producer → Intermediary → Wholesaler → Consumer

Olive oil/pickle:

- Channel #4: Producer → Own processing → Consumer
- Channel #5: Producer → Own processing → Processors → Consumer
- Channel #6: Producer → Intermediary → Processor → Consumer
- Channel #7: Producer → Own processing → Processors → Wholesaler → Consumer
- Channel #8: Producer → Own processing → Processors → Retailer → Consumer
- Channel #9: Producer → Own processing → Processors → Wholesaler → Retailer → Consumer
- Channel #10: Producer → Own processing → Processors → Wholesaler → Restaurant → Consumer
- Channel #11: Producer → Own processing → Processors → Retailer → Restaurant → Consumer

The supply chain analysis suggested that channels 9, 10, and 11 were the longest channels with six agents. Therefore, waste and logistic costs in these channels are expected to be higher when compared to the other channels. The shortest marketing channels are channels 1 and 4, with 2 and 3 agents, respectively. Channels 1, 2, and 3 (for raw olives) and channel 4 (olive pickles and oil), which are the shorter channels, have the least external intervention by processors, wholesalers, or retailers, and provide more direct contact between producers and consumers (i.e., end users). While selling directly to consumers has the potential to increase profitability for farmers, lack of technologies, marketing, and quality standards present barriers to increasing farmers' market share.

For channels 5 to 11, processors and wholesalers often require medium- to long-term purchase agreements to set standards and assure quality. For example, intermediaries tend to require bulk shipments with consistent quality, yet, farmers tend to package olives into large plastic containers that can lower the quality of the final product (Governorate of Irbid, 2013). Channel 5 includes producers processing olives and selling them to processors, who would then re-package and add value and labels to the product.

In recent years, olive producers have been slowly embracing modern production techniques (i.e., industrial practices and market standards). However, a large portion of them continue to follow traditional post-harvest methods. In both cases, producers must recognize the importance of timely olive collection and prioritize factors like food safety and blemishes. Incorporating market standards is crucial for maintaining product quality throughout subsequent processing stages and accessing price premiums.

Considering the current market channels in Nineveh Plains, our results suggest that the most significant potential growth is in channel 1 for raw olives and channel 4 for olive oil or pickles. By eliminating intermediaries, olive farmers have the potential to reap full profits by earning a greater portion of consumer expenditures. While there are important advantages, selling directly to consumers can present challenges such as a lack of marketing and logistics. Our data suggests that intermediaries and retailers have a better understanding of consumers' needs and are able to market olive products to appeal to demand. To overcome these issues, olive producers need access to information and training to better market the olive products in terms of quality, branding, and labeling.

4. Conclusion and Discussion

This market report describes the olive supply chain within the Nineveh Plains, an olive production region in the northern part of Iraq. The main contribution of this study is highlighting the potential opportunities and most salient barriers to access markets for olive farmers. Our market analysis sheds

light on the existence of the most important products in the olive supply chain: raw olive, pickle olive, and olive oil, sold through 11 market channels. Olives distributed through market channel 1 (raw olives) and channel 4 (olive oil or pickles) are sold through a direct-to-consumer market.

Selling directly to consumers (e.g., farmers markets) has gained popularity worldwide due to the numerous benefits for both farmers and consumers. Growers can take advantage of the benefits of selling directly to consumers, including lower initial costs and capturing a higher share of the consumers' expenditures, as they bypass intermediaries and third-party food processors in the olive supply chain. Our findings suggest that selling directly to consumers (market channel 1 and 4) seem to have the highest potential for olive farmers, yet one of the current disadvantages of selling in farmers' markets in the Nineveh Plains is the lack of marketing and quality information regarding consumer preferences and demand. Since farming is a full-time job for many olive farmers, they lack resources and knowledge on how to best prepare for the market and differentiate their products in local markets. Moreover, due to economies of scale and knowledge of market standards, the current supply chain favors growers who sell to different market channels, and only divert a smaller portion of their production to local markets. In addition, some of the most popular farmers' markets in the Nineveh Plains may have reached their maximum capacity for sellers, creating additional challenges, and entry may be highly competitive or even political.

Findings highlight that the majority of the Nineveh Plains olive consumers exhibit loyal behavior towards local olive products and would also recommend these products to their families. These combined findings suggest that expanding direct-to-consumer market access may provide a promising opportunity for olive growers. These producers can strengthen word-of-mouth advertisements and can use incentives to encourage satisfied consumers to share their experiences. Moreover, farmers can utilize available online tools to conduct marketing campaigns and thereby engage with potential clients. A direct market campaign for a specific segment of consumers can encourage consumers to support local agriculture while concurrently generating community interest.

Another significant contribution of this study was the identification of the different price points of the most important raw olive varieties across market channels in the Nineveh Plains. This information plays an important role in enhancing producers' decision-making processes. For instance, olive growers can effectively target the most suitable channel for their particular olive variety and profitability. Additionally, the significance of knowing the olive prices across the different market channels enhances producers' ability to strategically price their products, depending on their market channel and market power. With a better knowledge of olive price dynamics, producers can determine which olive variety is the most suitable to be sold in each channel, increasing their market share.

The study also provided the consumer preferences for local olive products and olive varieties. The Bashiqli olive variety was the most preferred one (80%) by the vast majority of table olive consumers in Nineveh Plains. We suggest producers, retailers, and restaurants emphasize the variety of olives they are commercializing to their consumers. In addition, we expect that integrating the Bashiqli variety into restaurant recipes can have greater appeal among olive consumers.

Researchers measured consumer purchase frequencies, the amount they were willing to pay for different local olive varieties, and the valuation they placed for different olive attributes. Our findings can help olive producers to segment their consumers based on their preferences. Consumer segmentation information, coupled with the mapped olive channels, and the olive prices across diverse

market avenues provide olive producers and stakeholders with market intelligence that can diminish the information asymmetry in the olive market chain in Nineveh Plains.

Our findings also highlight the most salient barriers faced by olive growers. For example, olive growers reported obstacles in the input supply for olive production. Fertilizers and pesticides were common challenges among farmers in Nineveh Plains due to difficulties in accessing imported products or the elevated prices of local alternatives. These findings suggest that establishing cooperative-like organizations can help farmers reduce procurement expenses, as well as maintain modest inventories, enhancing purchasing and selling power, and mitigating price volatility risks. On the other hand, our data suggests that addressing the issues related to water scarcity and inadequate electricity supply can greatly impact olive production and profitability.

In summary, the information provided by this market analysis highlights the existing constraints and opportunities along the supply chain and emphasizes the need to prioritize and improve the olive production process and distribution in order to contribute to the olive market environment. We have pointed out some challenges faced by the olive producers and provided some strategies for enhancing the olive market system in order to bring socio-economic benefits to rural and poor households. Results also provided a foundation for stakeholders and government officials to take strategic actions and promote the sustainable growth of the olive market in Nineveh Plains.

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Appendix 1 Market Segment Variables

Basis of segmentation	Segmentation variables	Typical breakdowns
Geographic	Region	Mosul, Tal Afar, Sinjar, Al-Hamdaniya, Shekhan, Al-Hadar, etc.
	City size	Under 10,000; 10,000-24,999; 25,000-49,999; 50,000-99,999; etc.
	Statistical area	Census, anecdotal information, surveys, etc.
	Media-television	Radio, social media, newspaper, etc.
	Density	Urban; Suburban; small town; rural
Demographic	Gender	Male; Female
	Age	Under 6 yrs; 6- 11 yrs; 12-17 yrs; 18-24 yrs; 24-34 yrs; etc.
	Race/ethnicity	Yazidi, Kaka'i, Turkmen, Shabaks, Christian, etc.
	Life stage	Child; youth; collegiate; adult; senior
	Birth era	Baby boomers (1946-1964); Generation X (1965- 1976); etc.
	Household area	1;2;3-4; 5 or more
	Marital status	Never married; married; separated; widowed; domestic partner
	Income	Less than 500,000; 500,000 - 749,000, 750,000 - 999,000, >1,000,000
	Education	No degree, primary, intermediate; secondary, college, etc.
	Occupation	Employee; daily wage worker, domestic worker, farming; etc.
	Religion	Catholic, Muslim, Hindu, etc.
Nationality	Iraqi, Turkish, Syrian, etc.	

Basis of segmentation	Segmentation variables	Typical breakdowns
Psychographic	Personality	Gregarious; compulsive; extroverted; aggressive; ambitious; etc.
	Values (VALS2)	Innovators; Thinkers; Achievers; Experiencers; Believers; Strivers; etc.
	Needs	Quality; service; price/value; health; convenience; etc.
	Motivations	Security, status, relaxation, comfort
Behavioral	Outlet type	Department; specialty; outlet; convenience; mass merchandiser; etc.
	Direct	Mail order/ catalog; door to door; direct response; Internet
	Product Features	Situation-specific; general
	Usage rate	Light user; medium user; heavy user
	User status	Nonuser; ex-user; prospect; first-time user; regular user
	Awareness	Unaware; aware; interested; intending to buy; purchaser; rejection
	Benefits sought	Quality, value, taste, image enhancement, beauty, sportiness, speed, excitement, entertainment, nutrition, comfort
	Situations	Birthdays, anniversaries, weddings, births, funerals, graduations
	Price sensitivity	Price-sensitive, value-conscious, status-conscious (not price-sensitive)

Appendix 2 Olive Consumer Analysis

Questionnaire 1

Dear friends,

This questionnaire is designed by Dr. Asaad Ali Karam and Dr. Rezgar Mostafa Mohammed from the University of Duhok to conduct the consumer analysis for the olive product in Iraq. The only objective of this survey is to help the olive producers overcome the marketing challenges hoping that they can make agriculture their main source of income. Please remember that your response will remain confidential and will be used only for the purpose of this study. In case you have any questions regarding the survey, please call one of the team members. Dr. Asaad: +964(750)464-0040 - Dr. Rezgar: +964(750)450-0838

Thank you very much for your time.

Part 1: Choice Experiment

Q1. Please select one of the following.

1. I would buy the imported table olive at the price of 6,000 dinars per kilogram, on average.
2. I would buy the local table olive at the price of 3,000 dinars per kilogram, on average.
3. I would not buy the above-mentioned olive types.

Part 2: Demographics Information

Q2. What is your age?

1. 18 - 24
2. 25 - 34
3. 35 - 44
4. 45 - 54
5. 55+

Q3. What is your gender?

1. Male
2. Female
3. Prefer not to say

Q4. What is your religion?

1. Muslim
2. Christian
3. Yazidi
4. Other

Q5. What is your place of residence?

1. Bashiqa district
2. Bahazani sub-district
3. Al-Fadhiliya sub-district
4. Nineveh Governorate
5. Erbil Governorate
6. Duhok Governorate
7. Sulaymaniyah Governorate
8. Southern governorates
9. Other

Q6. What is your marital status?

1. Single
2. Married
3. Prefer not to say

Q7. What is your educational level?

1. Less than a high school degree
2. High school degree or equivalent
3. Diploma two years
4. Bachelor's degree
5. Master's degree
6. Ph.D.
7. Other

Q8. What is your current occupation?

1. Employed full-time
2. Employed part-time
3. Self-employed
4. Unemployed
5. Retired
6. Other

Q9. What is the average monthly household income (in Iraqi Dinar)?

1. Under 500,000
2. 500,000 – 1,000,000
3. 1,000,001 – 1,500,000
4. 1,500,001 – 2,000,000
5. 2,000,001 – 2,500,000
6. 2,500,001 – 3,000,000
7. 3,000,001 and above

Q10. What is the size of your household?

1. 1
2. 2
3. 3
4. 4
5. 5 and more

Part 3: Consumer Preferences & Willingness-to-Pay**Q11. How many times do you purchase table olives (imported or local) in a month?**

1. 1 time
2. 2 times
3. 3 times

4. 4 and more

Q12. How many kilograms of table olives (imported or local) do you usually buy at each purchase?

1. I never buy olives
2. 0.5 kilogram
3. 1 kilogram
4. 2 kilograms
5. Other...

Q13. How likely is it that you would recommend local table olives to a friend or colleague?

1. Recommend
2. Not recommend
3. Not applicable

Q14. How much (Dinar/kg) are you interested in paying for local table olives?

1. Not applicable
2. 3000
3. 3500
4. 4000
5. 4500
6. 5000
7. 5500
8. 6000
9. 6500 and more

Q15. Which of the following are the main reasons that prevented you from purchasing local table olives? (Select all that apply)

1. It is not available all the time
2. It is a small size
3. It has a low quality

4. It is not graded
5. It is not packaged
6. Lack of trust in local products
7. I do not buy table olives for other reasons not mentioned here

Q16. What type of olive product do you buy most often?

1. Raw olive
2. Table olive
3. Olive oil
4. None of these

Q17. From whom do you usually purchase olive products?

1. Farmer
2. Retailer
3. Wholesaler
4. Trader

Q18. Please rank important attributes when buying any type of olive (Please make one selection per column).

1 = highest importance - 6 = lowest importance

- | | 1 | 2 | 3 | 4 | 5 | 6 |
|----|---|---|---|---|---|---|
| 1. | | | | | | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. | | | | | | |
| 6. | | | | | | |

Q19. To what extent does the color of olive type affect your purchasing decision and preferences?

1. Not important at all

2. Slightly Important
3. Important
4. Fairly Important
5. Very Important

Q20. To what extent does the texture of olive type affect your purchasing decisions and preferences?

1. Not important at all
2. Slightly Important
3. Important
4. Fairly Important
5. Very Important

Q21. Do you agree that the Nutritious (or trust of product) affects your purchasing decision and behavior towards olive varieties consumption?

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly Agree

Q22. What is (are) your main source(s) of information about olives? (Select all that apply)

1. Past experience
2. Friends and family
3. Television
4. Internet and other social media platforms
5. Other

Q23. "Within the past 3 months, I have seen or heard an advertisement for imported olive". Do you agree with this statement?

1. Yes

2. No

Q24. "Within the past 3 months, I have seen or heard an advertisement for locally-produced olive". Do you agree with this statement?

1. Yes
2. No

Q25. Where did you see/hear that advertisement for Olive?

1. Television
2. Radio
3. Newspaper
4. Internet and other social media platforms
5. Not applicable

Q25. Do you agree that the Availability of the product affects your purchasing decision, behavior, and preferences toward olive varieties consumption?

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

Q26. Do you agree that the Perception of the product affects your purchasing decision, and preferences towards olive varieties consumption?

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q27. Do you agree that the monthly household income affects your purchasing decision and preferences towards olive varieties consumption?

1. Strongly disagree

2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

Q28. How do you usually pay attention to recommendations while buying olive products?

1. I often follow family members' recommendations when I purchase olives.
2. I often follow my friends' recommendations when I buy olives.
3. I often follow my co-workers' recommendations when I purchase olives.
4. I often follow web celebrities' recommendations when I buy olives.
5. Other factors not mentioned here.

Q29. Which of the following does apply to you?

1. I pay special attention to positive word of mouth when purchasing olive varieties.
2. I often read online recommendations when purchasing olive varieties.
3. Written recommendations and positive comments in newspapers or journals make me more confident in purchasing olive varieties.
4. None of these are mentioned here.

Q30. Which of the following statements is most suitable for you?

1. I am not sufficiently informed about these products (olive varieties).
2. I cannot afford to pay more for these products (olive varieties).
3. I do not have enough time to pay attention to these products when I am at the supermarket (olive varieties).
4. I do not have confidence in what is promised by these products (olive varieties).
5. I do not find these products in the store where I usually do shopping (olive varieties).

Appendix 3 Interview Questionnaire

The amount of olive production in Nineveh Plains

1. Area Name:
2. Quantity of olive trees: Deem irrigated.....
3. What is the total area of olive trees planted in 2022.....
Dunum.
4. How many olive trees are registered?
5. How big is the olive tree in total?
6. How far apart are the trees..... meter?
7. How many fruit trees were planted in the current and previous years..... Tree/Dunum.
8. Varieties of olives grown with you:

number	Item	Area / Dunum	Number of trees	Total number of trees	Fruitful production quantity
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

- 9- What are the production costs per acre of olives?..... .
- 10- What are the costs of transporting olives to the press?..... .
- 11- What are the costs of transporting olives to the store?..... .
- 12- What are the costs of transporting olives to the market?..... .
- 13- What are the production differences for the last 3 seasons?

14- What is the date of picking?

15- Picking methods: by hand with a stick and a motorized comb

16 – What was the amount of olive production in the previous year?.....

17 - To what extent is the discharge of olive production in quantity and price?

Depreciation part

- Household consumption
- Household era consumption
- The need for individual consumption is the rate of each farmer

Selling part

- The owner of the Winepress
 - Wholesaler
 - Retail Trader
- 18 – What was the amount of oil extracted in the previous year?
- 19 - What is the amount of olives produced in tons for the previous year?
- 20 – What is the area of unused agricultural land?
- 21 – What is the last stop of the Bashiqi olives, i.e., where does this product go?

Appendix 4: Market Segmentation Questionnaire

Dear Madam / Sir,

You are invited to participate in an "Olive Market Segmentation" research study. This study is being conducted by Dr. Asaad Ali and Dr. Rezgar Mohammed with financial support from the University of Duhok. This survey is designed to study demographic, psychographic, geographic, and behavioural factors needed for the marketing analysis of olive.

Your participation in this study is voluntary and you are free to withdraw your participation from this study at any time. The survey should take only 10 minutes to complete. These responses will be held confidential and will not identify you in any way. Thank you for responding to these questions.

In case you have any queries, please contact us using the following numbers (07504640040, 07504500838).

PART I: DEMOGRAPHIC FACTORS

1. What is your age? Select your age range from the options below.

1. 18–24
2. 25–34
3. 35–44
4. 45–54
5. 55+
6. Prefer not to say

2. Which gender do you identify yourself with?

1. Male
2. Female
3. Prefer not to say

3. What is your religion?

1. Muslim
2. Christian
3. Yazidi
4. Prefer not to say

5. Other:

4. Where are you currently located?

1. Bashiqra
2. Bazani
3. Al-Fadhlyia
4. Mosul
5. Duhok
6. Erbil
7. Southern cities
8. Others:

5. What is your marital status?

1. Single
2. Married
3. Divorced
4. Widowed
5. Prefer not to say

6. What is the highest degree or level of school you have completed?

1. Less than a high school degree
2. High school degree or equivalent (e.g., GED)
3. Diploma two years
4. Bachelor degree
5. Master's degree
6. Ph.D.
7. Other (you can specify below)

7. What is your current employment status?

1. Employed full-time

2. Employed part-time
3. Unemployed
4. Self-employed
5. Retired
6. Unable to work
7. Student
8. Other (you can specify below)

8. What is your average monthly household income (in Iraqi Dinar)?

1. Under 500,000
2. 500,000 – 1,000,000
3. 1,000,001 – 1,500,000
4. 1,500,001 – 2,000,000
5. 2,000,001 – 2,500,000
6. 2,500,001 – 3,000,000
7. 3,000,001 and above
8. Prefer not to say

9. Which best describes your occupation?

1. Salaried
2. Non-salaried Self-employed professional
3. Business person
4. Skilled worker
5. Trader
6. Shop owner
7. Student
8. Homemaker
9. Retired

10. Others
11. Prefer not to answer

PART II: PSYCHOGRAPHIC FACTORS**10. What do you prioritize the most?**

1. Family
2. Work
3. Social life

11. Do you worry about climate change and its impact on an olive product?

1. 1 = not worry at all
2. 2 = worry a little
3. 3 = worry too much

12. What was the recent quantity of olives you bought (in Kg) this week?

1. One
2. Two
3. Three
4. Four
5. Other:

13. Are you an optimist or a pessimist of olive production?

1. Optimist
2. Pessimist

14. Have you ever boycotted an olive product because of a poor experience?

1. Yes
2. No

If your answer is Yes, then which olive product (Name)?

15. What do you pay more attention to while buying the olive product?

1. Price
2. Quality

16. Where do you usually purchase olive products from?

1. A farmer
2. Retailer
3. Wholesaler
4. The factory
5. A company

17. Would you usually find the olive product you are looking to buy in markets?

1. Yes
2. No

18. "You buy olive because of health benefits." How do you agree with this statement?

1. Strongly Disagree
2. Disagree
3. Neither Agree nor Disagree
4. Agree
5. Strongly Agree

19. "You are planning to buy olives from your relative farmers." How do you agree with this statement?

1. Strongly Disagree
2. Disagree
3. Neither Agree nor Disagree
4. Agree
5. Strongly Agree

20. “There is no doubt that the community needs of olive are available to them.” How do you agree with this statement?

1. Strongly Disagree
2. Disagree
3. Neither Agree nor Disagree
4. Agree
5. Strongly Agree

21. To the best of your knowledge, what type of olive product do people buy more often? (Please circle all that apply)

1. Raw olive
2. Olive
3. Olive oil
4. Olive pickles

22. How often do you buy olive products in a week?

- 1
- 2
- 3

More: times

23. At what price would you consider the olive product to be too expensive to buy?

1. 4000 IQ
2. 5000 IQ
3. 6000 IQ
4. 7000 IQ
5. Other:

24. Which of the following is your hobby?

1. Dancing
2. Drawing

3. Soccer/Football
4. Tennis
5. Walking /Track
6. Science Club
7. Reading
8. Horse Riding
9. Musical Instrument
10. Local Gym
11. Farming
12. Other:

25. “I like to take the long-distance road to get the olive product.” How do you agree with this statement?

1. Strongly Disagree
2. Disagree
3. Neither Agree nor Disagree
4. Agree
5. Strongly Agree

26. At what time of the day do you use the olive product most often?

1. Morning
2. Afternoon
3. Evening
4. Other.....

27. If you have to describe a local olive Bashiqi to a friend, what would you suggest to them?

1. Very Bad
2. Bad
3. Neutral

4. Good
5. Very Good

28. Can you name a local olive product?

1. Yes
2. No

If yes, then what?

29. How much are you willing to pay (in Iraqi Dinar) for a kilogram of the olive product?

1. 1000
2. 1500
3. 2000
4. 2500
5. 3000
6. 3500
7. Other:

30. How would you feel if you no longer could buy a local olive?

1. Very Bad
2. Bad
3. Neutral
4. Good
5. Very Good

PART III: GEOGRAPHY FACTORS**31. What is the relationship of your location to other locations?**

1. Very Bad
2. Bad

3. Neutral
4. Good
5. Very Good

32. How does the importance of your location change over time?

1. Does not change
2. Relative
3. Partially
4. Totally
5. Absolute

33. How would you describe your satisfaction with where you live physically?

1. Very Dissatisfied
2. Unsatisfied
3. Neither satisfied nor unsatisfied
4. Satisfied
5. Extremely Satisfied

34. To what extent do you rate examples of human/environment interaction you see in your area?

1. Very Bad
2. Bad
3. Neutral
4. Good
5. Very Good

35. Do you see evidence of exploited natural resources in your area?

1. Yes
2. No

36. Do you see changes in the landscape in olive trees?

3. Yes
4. No

PART IV: BEHAVIORAL FACTORS**37. Which of the following applies to you?**

1. First-time buyers
2. Regular users
3. Defectors

38. What kind of customers do you think you are?

1. Complex
2. Variety-seeking
3. Dissonance-reducing
4. Habitual

39. Which of the following purchasing patterns apply to you as a customer?

1. Universal occasions (holidays, seasonal events, etc.)
2. Recurring-personal occasions (birthdays, anniversaries, regular monthly purchases, etc.)
3. Rare-personal occasions (weddings, road trips, etc.)

40. Why do you buy olives?

1. Health benefits
2. Culture
3. Other:

41. Do you consider yourself a loyal customer for a local olive?

1. Yes
2. No

42. How do you think the olive producers can keep their customers happy?

1. By offering a high-quality product
2. By offering excellent customer service
3. By keeping prices low
4. By supplying what they are looking for
5. Other:

Thank you for your participation in filling out this survey, your valuable opinions are important to us and will help us improve the segmentation of the olive market in Iraq