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Distribution of the Added Value of the Date Palm Sector, Deglet Noor Variety, among Economic Actors in the Province of Biskra

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Abstract:

The agricultural sector is considered to be the repository of food security, which has led to the interest in developing it and improving its productivity, then disposing of the production to places of consumption in a fair distribution. This is where the importance of agricultural marketing appears, which is considered a complementary element to agricultural production. There is no meaning to production without marketing, as marketing is related to all elements of the production process, from consumers to marketers, and producers.

Since Algeria has a wide area of date palm plantations, it includes millions of palm trees that produce dozens of types of dates, the best of which is "Deglet Noor" dates. Through this study, we tried to study the agricultural dynamics from the marketing aspect of the Deglet Noor date palm sector in Biskra Province, which represents 65.6% of total production, focusing on the added value that each economic actor involved in the date palm sector takes. The study sample included 96 agricultural investors and 44 wholesale merchants who were randomly selected in the city of El Ghrous, as it is a leader in the agricultural field.

The study concluded that the internal marketing of dates often passes through some intermediaries, which raises the price of dates for the consumer and at the same time makes farmers the weakest link in the internal marketing of dates and that the biggest beneficiaries are the intermediaries.

Keywords: Date palm sector - Added value - Intermediaries – Farmer.

1.Introduction:

The agricultural sector holds immense importance in Algeria due to its significant contributions to economic development and food security. This is evident in the various support programs implemented by the government, some of which directly target activities like date palm cultivation and production. These activities form a fundamental pillar of agricultural output in the southern regions, generating substantial nutritional, social, economic, and environmental impacts in their areas of operation (Ben Aïchi, 2002, p. 70).

From an economic perspective, this cultivation plays a crucial role in stabilizing populations within these regions, providing much-needed jobs, and supplying dates for both domestic and

international markets. Additionally, it generates valuable foreign currency through yearly exports. (Ben Ziouche, 2012, pp.131-132).

Algeria sits among the leading date-producing nations globally. The country boasts an estimated 19 million palm trees spread across 167,000 hectares, representing roughly 2% of its total landmass (Ministry of Agriculture, 2022).

The primary zones for date production in Algeria are concentrated in the central desert regions and the southeastern areas bordering Tunisia. Other notable contributors include Bechar, Naama South, and Adrar provinces in the far southwest along its borders with Morocco, Mauritania, and Mali. Among these regions, Biskra, Ouargla, and El Oued stand out as principal production hubs. These three provinces collectively occupy 61% of the land dedicated to date cultivation and contribute to over half of Algeria's total date production. Notably, the Deglet Noor variety accounts for an impressive 62% of the total data output in 2022, with Biskra contributing 50.14%, El Oued 29.88%, and Ouargla 15.9%. (Direction des Services Agricoles, Biskra, 2022).

Biskra holds the coveted title of being the nation's top date producer, boasting a total output of 3,700,364 quintals. Within this impressive figure, Deglet Noor varieties claim a sizeable 65.6% share. It is worth noting that the significance of agricultural production extends beyond mere physical quantity. The effective marketing and conversion of produce into monetary value (through reaching consumers) plays an equally critical role. Marketing serves as a vital counterpart to the production process, ensuring the seamless flow of products from producers to consumers, ultimately transforming them into added value. This added value then becomes distributed among all economic actors involved, with each participant receiving a portion of the final price paid by the consumer. The specific share claimed by each actor directly influences their capacity to invest in production improvement or diversification.

In light of these intricate dynamics, we are led to our central question:

What is the share of the added value of Deglet Noor dates in the Biskra province captured by each economic actor?

2. Hypotheses:

- If each agent's share were proportional to the investment they make and the risks they take to produce and bring the product to the consumer, the farmer's share would be much larger than it is currently.
- The distribution of value among the different agents is explained by the opacity of markets due to the inability of public authorities to impose a transparent functioning of markets

3. Methodology and Research Tools:

3.1. Research Methodology: To complete the study and answer the central question raised in the problem, we adopted the descriptive-analytical approach, which is appropriate for providing data, information, and facts about the research topic.

3.2. Data Collection and Analysis Tools: We used an interview form to collect information. In the first phase, we prepared two experimental forms, one for farmers in the agricultural investment and the second for wholesalers in the fruit and vegetable market. These forms were then modified and formulated in their final form.

The collected data underwent several statistical and computer-assisted treatments. These analyses allowed us to establish a typology of palm groves based on their size and the commercialization methods employed. This typology was implemented using the STRUGES rule.

Drawing upon this established typology and identifying the key economic actors within the sector, we were able to calculate:

- The production cost of one kilogram of dates, including both production and marketing components, and its breakdown across the value chain (by fellah, date collector «Kheresse», wholesaler, and retailer).
- Production expenses, revenue, and operating profit (per hectare and date palm).
- The added value captured by each economic agent involved.

4. Research Population and Sample :

In the framework of the research project "Marketing of agricultural products in the Biskra province", at the Scientific and Technical Research Center for Arid Regions (CRSTRA), the study sample included 96 agricultural enterprises selected randomly in the municipality of El Ghrous as the leading region in the agricultural field and for its inclusion of a wholesale market for vegetables and fruits that supplies various states of the country, as well as 44 wholesalers in the vegetable and fruit market.

To answer the problem and achieve the desired objectives of the study, it was divided into the following elements

Phoenix culture is the term used to refer to the cultivation of date palms. This tree is perfectly adapted to arid environments, as it does not require a large amount of water, which is why it is so widely planted in the Saharan region. The date palm makes it possible to make an arid space viable at a low cost and creates a microclimate that allows for the establishment of intercropping and livestock. (Januel, 2009).

is considered to be the central pivot around which life revolves around Phoenix culture in the Saharan regions. It has great socio-economic and environmental importance in many countries (Benharrat, 2022, p.3).

The importance of Phoenix culture is demonstrated both from an economic point of view, through its role in stabilizing the population in the Saharan zones, the jobs it provides, as well as the products that are marketed on national and foreign markets, and the strong currencies that are derived from the export of its product each year. (Benziouche, 2008, p.132)

However, agriculture is facing difficulties in meeting new demands arising from various socio-economic, demographic, technological, and cultural changes. The undervaluation of date palm products and by-products, water resources, existing renewable energies, and date palm products, as well as the intercropping and peripheral space of palm groves, are an undeniable indicator of non-development, or even regression. Therefore, these oasis agroecosystems must evolve and adapt to new socio-economic and technological requirements while also ensuring that the established balance is preserved.

5. Date Palm Sector in Algeria :

Algeria is one of the most important date-producing countries in the world, and it is the first in the Maghreb. Algeria has a significant area of date palm groves, which produce a variety of dates. Most of Algeria's date palm groves are located in the northern Saharan provinces and the southern steppe provinces. 17 provinces in Algeria produce dates entirely, with a large genetic diversity. (Maachi, 2022, p.36)

The area of date palms in Algeria has quadrupled between 1962 and 2019. There are currently about 19 million date palms, including 16.13 million productive date palms that produce more than 1.058 million tons of dates, all varieties combined, including 54% of the Deglet Noor variety. (Seba, 2020, p.17)

Date palm groves in Algeria witnessed significant development during the period from 1983 to 1995 as a result of the issuance of Law 18-83 on agricultural land ownership, which included the distribution of large agricultural areas, the preparation of lands in the Saharan regions, and the renewal of date palm groves. This led to an increase in the area of date palms from 65,000 hectares to 87,020 hectares, with an increase of 22,020 hectares.

During the period 2006-2021, the area of date palms witnessed an initial increase at a rate of 24,127 hectares to reach 172,033 hectares in 2021. This reflects the extent of the importance that the state has attached to the date palm sector through the incentives it has provided to farmers, which primarily include the preservation of date palm forests and their renewal, as well as the construction of packaging and export units, especially in the main producing provinces such as Biskra, El Oued, Ouargla, Ghardaïa, and Adrar. (Sahia, 2023, p.35)

As for production, the development of date production has continued, especially in the Saharan provinces and the southern steppe provinces. In the period from 2000 to 2009, production increased by 39%, from 365.6 thousand tons to 600.7 thousand tons, thanks to the implementation of the National Agricultural Development Plan, especially in Biskra. The period from 2010 to 2019 witnessed an increase in production from 644.7 thousand tons to 1.13 million tons, an increase of 76%, to reach 1,151,909 tons in 2020, thanks to the National Agricultural Development Program and the policy of renewing the agricultural and rural economy (PREAR) and the new farms that new farmers established.

5.1. Producing Provinces in Algeria

Date palms are found in the southern regions, where there are 17 producing provinces: Ziban (Biskra), Souf (El Oued), Oued Righ (M'Sila, Tébessa), Ouargla, Mzab (Ghardaïa), Touat (Adrar, Timimoun), Tidikelt (Ain Salah), Saoura (Béchar), Hoggar-Tassili (Tamanrasset, Djanet). There are also small date palm groves in the southern steppe provinces (Tebessa, Khenchela, Batna, Guelma, Ouargla, M'Sila, Naama, and El Bayadh) (Maachi, 2022, p.36).

Biskra province holds the largest area allocated to date palms, occupying 25.84% of the national area of date palm cultivation, or 44,051 hectares, which reflects the importance of the date palm tree for the people of Biskra. The total agricultural area is estimated at 777,768 hectares or about 76.28% of the total area of the province. The area suitable for agriculture is estimated at 161,493 hectares, or 15.84% of the agricultural area, of which 108,543 hectares are irrigated land,

representing 67.21% of the agricultural land suitable for cultivation. (Directorate of Programming and Budget Monitoring, 2021)

6. Date Palm Sector in Biskra Province :

6.1. Introduction to the Region and its Production System:

Biskra province is located in the southeastern region of the country, under the foothills of the Aurès Mountains, which represent the natural boundary between it and the north. It has an area of 102,460 square kilometers and includes 27 municipalities and 10 districts. It is bordered by:

- Batna province to the north
- Khenchela province to the northeast
- Ouled Djellal province to the southwest
- El Oued province to the south

6.2. Production System in Biskra Province:

There are two production systems in the Biskra region:

- **Mountain system:** This system falls within mountain agriculture and relies on the use of surface water. This system is marginal in size (it represents 12% of the agricultural area of the province) and is characterized by small farms that combine date palms, fruit trees, and other subsistence crops (cereals) with family livestock breeding.
- **The second production system,** which is the most important in terms of area (it occupies 80% of the agricultural areas), is the intensive oasis system that relies on the use of groundwater resources. It is characterized in particular by the practice of date palm cultivation, cereal crops, and field agriculture, as well as livestock breeding

6.3. The Reality of the Date Palm Sector in Biskra:

Biskra is one of the most important date palm growing regions in Algeria, not only in terms of production, but also in terms of quality, and from the perspective of biological diversity within date palms. There are about 300 different varieties, and the Deglet Noor variety is considered to be one of the most famous and finest varieties.

The area allocated to date palms in Biskra province has been steadily increasing from year to year. The area was estimated at 24,745 hectares in 2000, reaching approximately 44,251 hectares in 2022. This represents a significant increase and is due to the intensive cultivation of new date palm groves and the renewal of old date palm groves that were implemented by the state to develop the date palm sector, especially through the National Agricultural Development Program (PNDA) in 2000. (Directorate of Agricultural Affairs Biskra, 2022.)

The PNDA in Biskra province had a clear impact on date palm cultivation and its number, as the number of date palms in the province increased significantly during the period 2011-2022. The province's total number of date palms and productive date palms increased from 3,221,035 palms in 2000, including 1,998,575 productive palms, to 4,021,117. In 2010, the number reached 4,171,447 palms, including 3,037,722 productive palms, and finally 38,036,230 productive palms in 2022.

In terms of the trend of production in palm groves in Biskra province, it has known continuous growth during the period (1993-2022) according to the Directorate of Agricultural

Affairs of Biskra province, except for drought years. Production of dates has increased from 126,3244 tons in 2000 to 3,335,414 tons in 2022.

The date palm sector is influenced by several factors and actors, which can either positively or negatively impact the sector. The main actors in the date palm sector in Biskra are:

- **Producers (Phoenix-culture/date palm growers)**: The sector includes producers from two main types of oases: traditional and modern oases (Bachta et al, 2006). Producers face several challenges, such as the scarcity of skilled labor, the lack of water resources, and sudden climate change (drought in recent years). As a result, farmers neglect the importance of carrying out certain cultural operations, such as pruning, limiting the number of bunches, and bagging. This leads to a decrease in the quality of the dates of this variety and a decrease in their market value (Haddou et al, 2016).
- **Collectors (foot buyers)**: Known as "Kharassa", they act as intermediaries between producers and (consumers, processors, or exporters). They play an important role in influencing prices. They buy dates from producers on behalf of downstream operators (warehouses, exporters) according to the scale and amounts decided by their customers and take a commission (Bachta et al, 2006). However, collectors, unlike producers, operate their economic activity in a context that is almost liberal, where prices on the domestic market are comparable to prices on the international market (Issaoui, 2002).
- **Cold storage facilities:** The number of cold storage facilities has grown significantly in recent years due to the delay of the month of Ramadan compared to the date harvest campaign when prices are rising. Cold storage is a very good method of preservation for a long period. Refrigeration companies supply exporters when they are out of stock and when they have exhausted their purchases, and they also sell to wholesalers, semi-wholesalers, and retailers (Ben Hamida, 2011).
- **Traders:** Whether wholesalers or retailers, these traders sell dates in large quantities to consumers. Traders ensure the transformation of raw materials into finished consumer goods (Beamon, 2005).
- **Consumers:** Consumers benefit from the exacerbated competition between companies, which leads to "a price war" and very low prices. Production meets the demand of consumers who satisfy their needs through consumption and thus achieve well-being.

7. The Field Study :

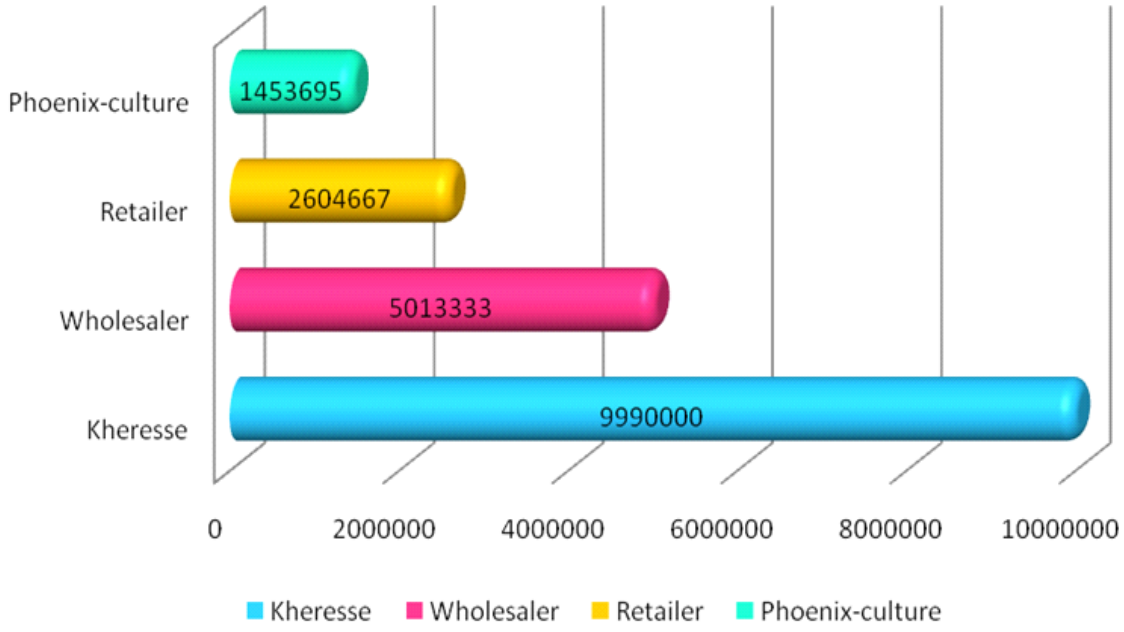
Based on the theoretical side of the study, in which we discussed the definition of the region and its production system, and the reality of the date palm sector in Algeria and in the Biskra region, this field part conducted in the Biskra region, we will focus on the marketing of dates in the region with a focus on the added value of dates and how it is distributed to the stakeholders in the data sector. We have relied on a set of variables, including:

- The cost of production and marketing of a kilogram of dates
- The structure of charges for one hectare of date palm (farmer, date collector «Kheresse», wholesaler, and retailer).

The results were as follows:

7.1 Added Value from Producer to Trader

Figure 1: Added value from producers to traders

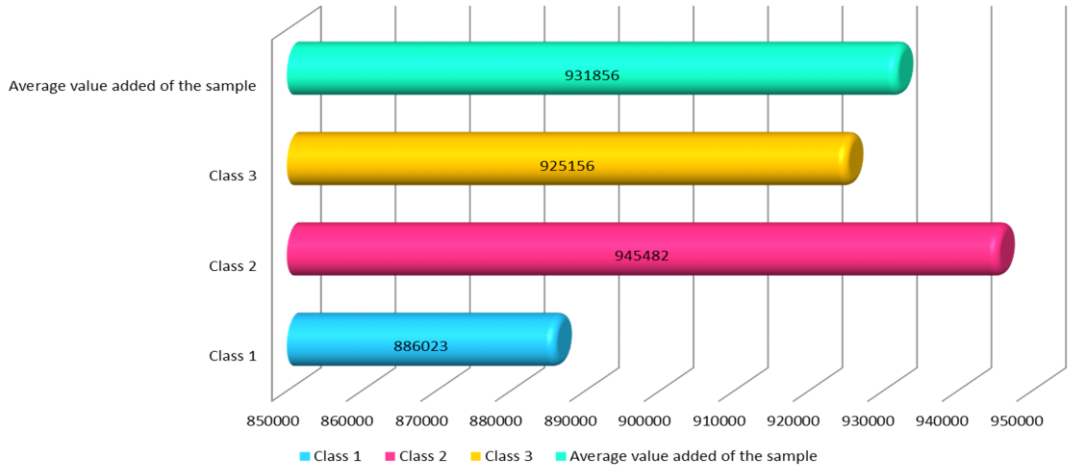


Source: field study

According to our results, we found that the added value, which is defined as the value of production minus intermediate consumption, is low for the fellah compared to other stakeholders in the value chain. For example, the share of added value for the DATE COLLECTOR is 7 times greater than that of the Fellah. And that the added value of the wholesaler is 3.5 times more than that of the farmer. And the added value taken by the retail trader is twice that of the farmer.

7.2. Added value and farm size

Figure 2: Added value and farm size (VA/ha)

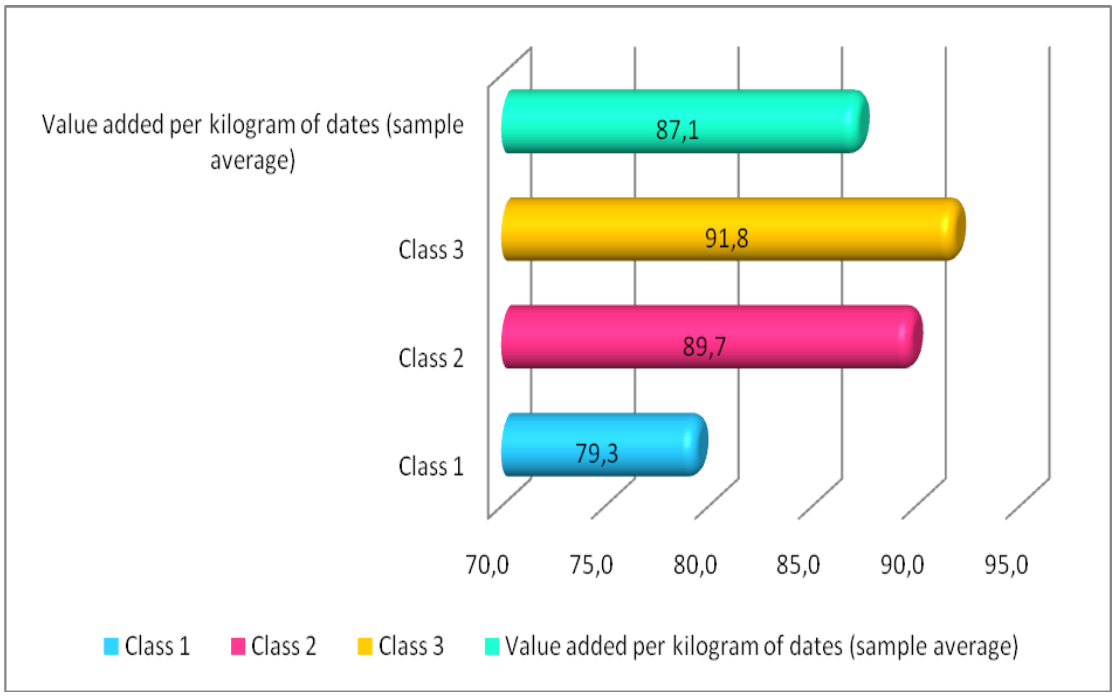


Source: field study

The analysis of added value according to the size of the date palm grove shows that the smallest palm grove has the smallest share. However, overall, the difference between classes remains low (less than 5%).

7.3. Added Value per Kg of Dates by Size of Date Palm Groves

Figure 3: Added value per Kg of dates by size of date palm groves

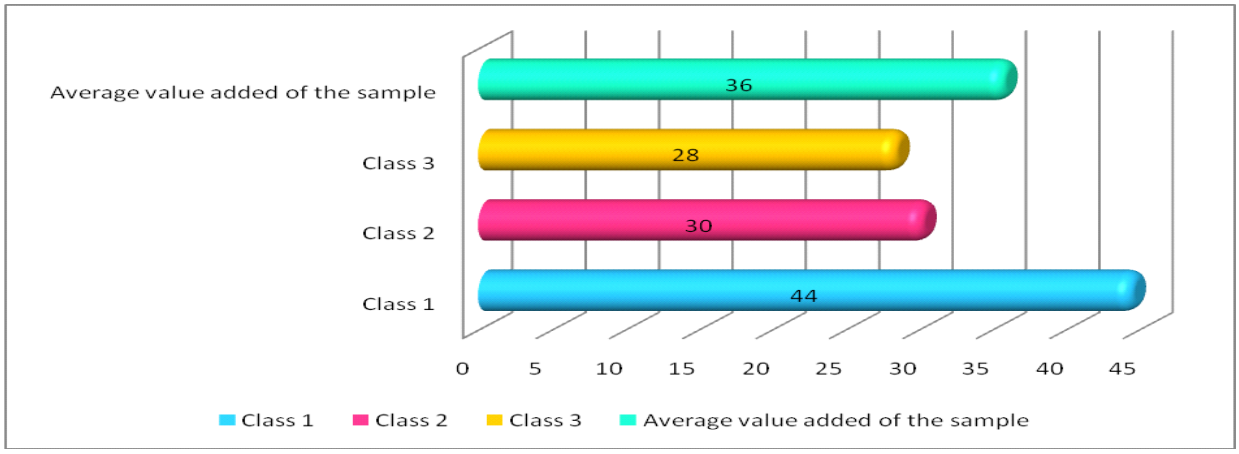


Source: field study

The analysis of added value per kilogram of dates and by date palm grove class shows that the value collected increases with the number of date palms. The small date palm grove realizes a value-added /kg= 79 DA/KG. Class 3 realizes a value-added per KG higher than 12% of that of class 1.

7.4. Cost of production and sizes of date palm groves

Figure 4: Cost of production and sizes of date palm groves

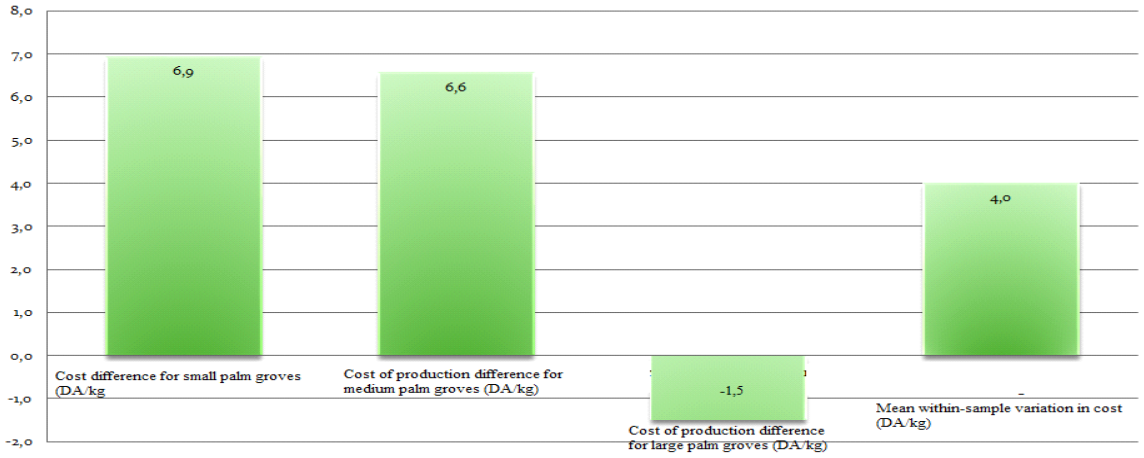


Source: field study

The analysis of the cost of production of a kilogram of dates shows that it decreases with the size of the date palm grove. It is 44 DA/kg for the small palm grove, 30 DA/kg for the medium, and 28 DA/kg for the large palm grove. The cost of production is determined by the most frequent size, in our case, it is the small palm grove which represents 77% of our sample. The large palm grove represents only 5%. The decrease in cost with the increase in the size of the date palm grove confirms the presence of economies of scale in this segment of the sector.

7.5. Cost of production of sale on the foot and sale on the wholesale market.

Figure 5: Differences between the costs of sale on foot and sale on the wholesale market

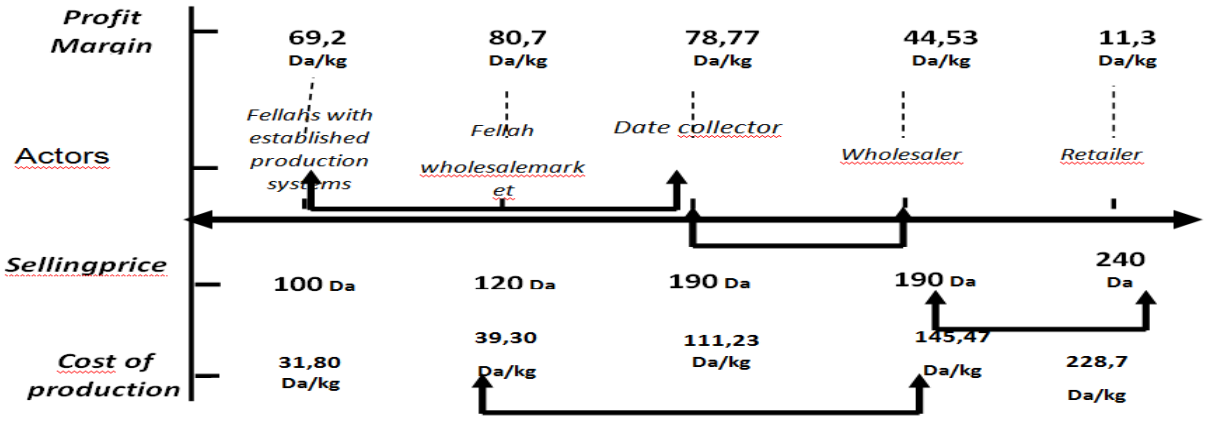


Source: field study

Overall, selling on the foot allows for a reduction in harvesting costs, especially those of labor, which translates into a lower cost of production for sellers on the foot than for sellers on the wholesale market. The advantage of selling on the wholesale market is only found at the level of the large palm grove. Figure 7 shows the difference in the cost of production between the two modes, which varies between 1.5 dinars (-1.5 DA, in the case of the large palm grove on the wholesale market) and 6.9 DA/kg.

7.6 Distribution Margin by Economic Agent

Figure 6: Diagram of distribution margin by economic agent



Source: field study

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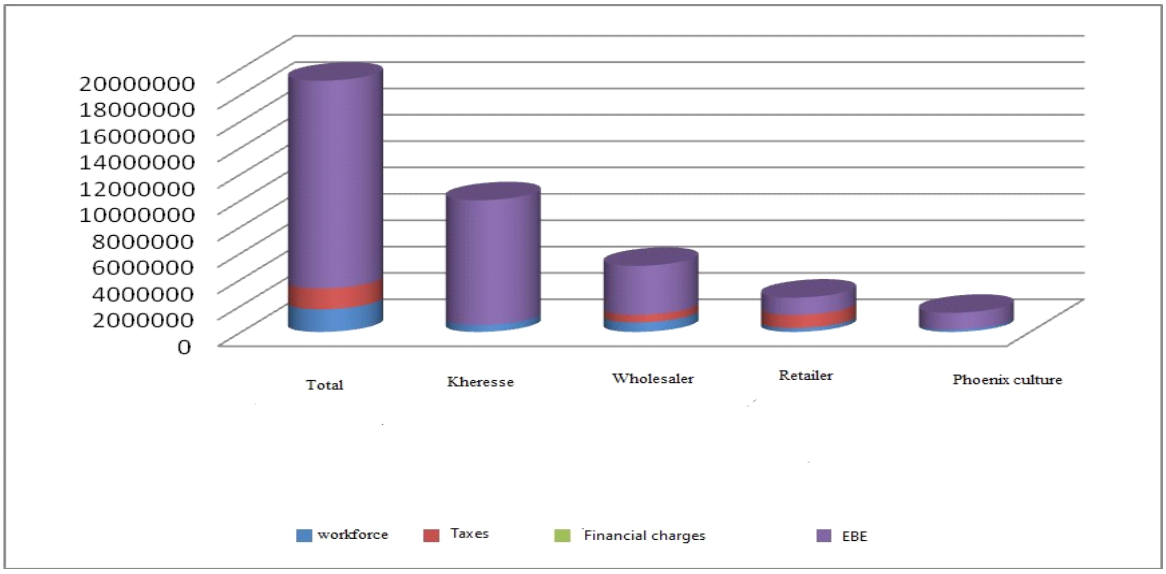
Our survey shows that the selling prices for the fellah selling on the foot are 100 DA/kg on average. And 120 DA/kg for the fellah who sells on the wholesale market. The presence of intermediaries increases this price to 240 DA/kg on average for the consumer. This represents an increase of more than 112%.

7.7. Added value by economic agents

Figure 7: Distribution of added value by economic agents

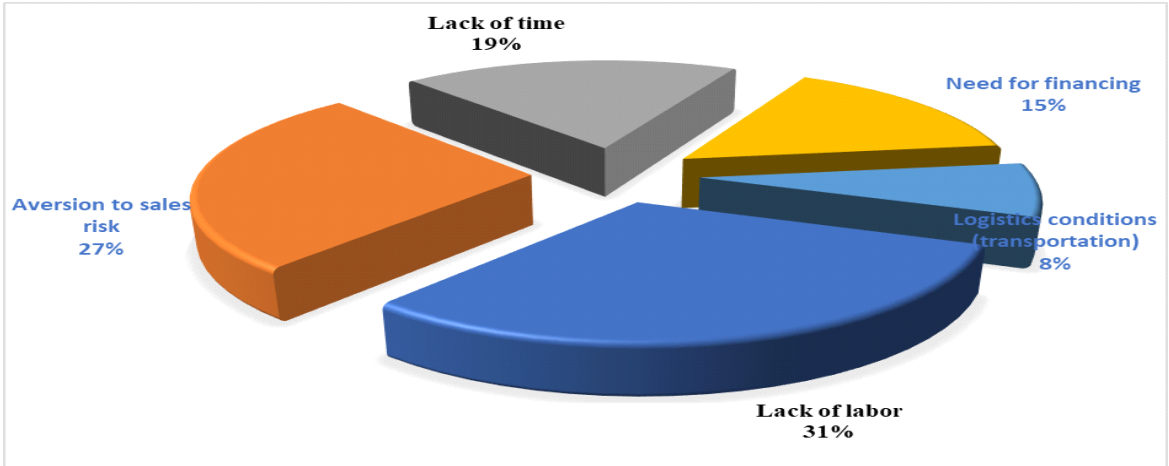


Source: field study

The added value per economic agent after the deduction of personnel costs, tax charges (taxes), and financial charges (interest) gives a low gross surplus for the Phoenix culture or about 8%. The data collector (kheresse) holds a share of over 60% of the EBE. Remember that a high gross surplus means a high self-financing capacity.

7.8. Sale on the foot

Figure 8: Causes of the sale on the foot



Source: field study

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According to our survey, 36% of respondents practice selling dates on the foot. Analysis of the reasons for this choice shows that the main reason is the scarcity of labor (31% of respondents).

Next comes the fellahs' desire to avoid commercial risks (i.e., the risks of sale and the instability of prices on the wholesale market). The time constraint was mentioned in third place in 20% of the responses (especially for purgatives).

The need for financing is the third most cited cause by the Phoenix cultures in our survey.

Some fellahs mentioned logistical problems (insufficient means of transport). These represent 8% of the total number of responses.

8. Conclusion and Recommendations :

8.1. Conclusion :

This work shows that the different types of palm groves achieve significantly positive results. However:

- The value added (VA) taken by the Phoenix cultures remains low compared to the other agents involved in the sector.
- The most important share of VA is captured by informal intermediaries.
- The scarcity of qualified labor is a real problem for the production segment.
- This phenomenon pushes the fellahs to sell on foot, which facilitates the penetration of informal intermediaries to dominate the supply and demand of the sector.

8.2 Recommendations :

- Generalize research on the date palm sector in time and space.
- Open up the research track on mechanization (harvesting) to reduce the impact of labor scarcity.
- Reducing the role of intermediaries in the marketing of dates and providing support to farmers in marketing their products

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