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### **Geographical Distribution of the Grain Milling Industry in the Province of Babylon**

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#### **Abstract**

The grain milling industry (flour industry) is one of the main branches of the food industry sector, and it is one of the important industries. The grain milling industry facilities vary in terms of their location among the administrative units distributed over (7) administrative units within the four districts of Babil Governorate, which was 21 industrial facilities. Hilla district comes first in the number of establishments with reached (16) facilities distributed over (2) administrative units in Hilla district for the year 2022, while the second rank comes from Hashemiyah and Musayyib districts with (2) industrial facilities for each. There are (4) administrative units in the district of Al-Hashemiyah and Al-Musayyab. The third and final rank is the Al-Mahaweel district with one industrial facility in the center of Al-Mahaweel district only, and Al-Mahaweel. While the other administrative units lack this industry, despite the natural geographic elements that the province of Babylon enjoys in terms of its location in central Iraq and its area (5119 km<sup>2</sup>) besides the human ingredients in terms of its population, the provision of manpower, and the existence of a transport network linking the parts of the province with each other. It links the governorate with other governorates, but it faces many obstacles and problems.

#### **Introduction**

Industrial activity is a primary goal in the developed and developing countries alike, and it seeks to achieve it because of its economic importance that supports the economic activity of the country. It also provides an industrial base

capable of absorbing labor and producing tools and equipment that serve the human being and facilitate the means for his requirements. It has a key role in accelerating the economic development through the added value it adds to the national income, which works to stimulate and strengthen the movement of economic activity and protect it from fluctuations that occur for various reasons.

#### **First, the research problem**

1. What are the bases for distributing the grain milling industry in Babil Governorate?
2. What is the nature of the geographical distribution of the grain milling industry in the province of Babylon.

#### **Second, the research hypothesis**

1. The researcher relied on a set of classifications for the geographical distribution of the grain milling industry in Babil Governorate.
2. The grain milling industry differs in its geographical distribution among the administrative units of the province of Babil, as a result of a number of factors, including the policy of the state and the availability of raw materials as well as transportation methods, as it is clearly concentrated in the center of Babil province.

#### **Third, the research objectives**

1. Knowing the geographical distribution of the grain milling industry in the province of Babylon and the interpretation of this distribution.
2. Explaining the fairness of the geographical distribution of the mills of the grain milling industry among the districts of the governorate, and a study of the reasons that led to this distribution.

#### **Fourth - Research Limits:**

The spatial boundaries are represented in the province of Babylon, located astronomically between two latitudes (33.7o-33.8o) in the north, and longitudes (43.42o-45.50o) to the east. Its area reached (519) km<sup>2</sup>, and the study area consists of 16 administrative units, and it is one of the Euphrates governorates. The central region, which is located in central Iraq, is bordered to the north by the governorate of Baghdad, to the east by Wasit governorate, and to the south by the governorates of Qadisiyah and Najaf, and from the west, it is bordered by the governorates of Anbar and Karbala (Chinda, 2020; Hansen, Rostiyanti, & Nafthalie, 2020).

**The temporal limits of the study:** the study was adopted in its geographical distribution for the year 2021

#### **First - the importance of the grain milling industry**

The grain milling industry is the mainstay in food security, as it enters the human diet directly or indirectly, and it is the main food source in Iraq in general

and the governorate in particular (Kinani, 2019). The food industry, including grain milling, is one of the first industries that should be given care and attention, because of its importance in strengthening rural economies by transforming primary agricultural raw materials into food commodities with great economic returns, as well as providing the necessary food needs for the population from food products daily consumption) Al-Khuzai, 2020(

### **Second - Geographical distribution of the grain milling industry in the province of Babylon**

The distribution of phenomena is an essential element in geographical study. Yet, the philosophy of geography and its work depends on the development of a conceptual framework aimed at dealing with the distribution of things and events in the spatial space. This does not necessarily mean an abstract description of the distribution of the phenomenon, but rather the need for explanation and interpretation, because the phenomenon is not distributed or arranged randomly, but rather reflects a spatial and functional relationship with other phenomena (Al-Rikabi, 2006; Jensen et al., 2020)

Some classifications were adopted for geographical distribution, including:

#### **1- Geographical distribution of the grain milling industry on the basis of ownership**

The grain milling industry facilities in Babil Governorate are classified on the basis of ownership into two categories:

A- Public sector grain milling industry establishments.

These are the enterprises owned by the state, and through the data of Table (1) and Figure (1), it is clear that the number of grain milling facilities affiliated to the public sector is one industrial facility that constituted 5% of the total facilities in the Babylon Governorate, which numbered (21) for the year 2021.

B - grain milling industry establishments belonging to the private sector.

These are the establishments owned by individuals with the operating capital of those facilities, which they established on an area of land owned by them. Through the data of Table (1), it shows the grain milling facilities belonging to the private sector in Babil Governorate for the year 2021. It appears that the number of establishments affiliated with the sector The private sector amounted to (20) industrial facilities, with a rate of 95% of the total grain milling facilities in the study area, distributed differently among the administrative units affiliated to the study area. The Hashemite and Musayyib districts ranked second with (2) industrial facilities for each of them, with a percentage of 10% of the total private facilities, and Al-Mahaweel district came in the last rank with one industrial facility that constituted 5% of the total private facilities as. It is clear from the previous presentation that the clear discrepancy in the spatial signature of the facilities comes from the lack of planning and follow-up, and the private sector took the largest percentage in the grain milling facilities and the weakness of the public sector in front of the private sector.

Table (1) Cereal milling industry establishments by ownership in Babil Governorate for the year 2021.

districts	Administrative units	Public Sector	Percentage	Private sector	Percentage
Hilla	Hilla Center	1	100	14	70
	Al Kifl hand	-		1	5
	Abi drowned hand	-	-	-	-
	the total	1	-	15	75
Al Muhaweel	Al Mahaweel Center	-	-	1	5
	project area	-	-	-	-
	front side	-	-	-	-
	Nile side	-	-	-	-
	the total	-	-	1	5
Hashemite	Hashemite Center	-	-	-	
	Al-Qasim sub-district	-	-	1	5
	Medhatiya hand	-	-	1	-
	Vanguard hand	-	-	-	-
	Shomali district	-	-	-	-
	the total	-	-	2	10
Al-Musayyab	<i>Musayyib Center</i>	-	-	1	5
	<i>cliff rock</i>	-	-	-	-
	<i>Alexandria district</i>	-	-	1	5
	<i>the total</i>	-		2	10
		1	100	20	100

This table is prepared based on the field study.

## 2- Geographical distribution of the grain milling industry on the basis of size.

The size of industries is a good quantitative indicator for measuring the degree of industrial development and the magnitude of industrial projects. The industrial establishments were classified according to what was stated in the Central Bureau of Statistics in 1983 into establishments (small, medium, large), and my agencies:

### A- Large grain milling industry facilities in Babil Governorate.

Through the data of Table (2), and Figure (1), which shows the number of large grain milling facilities in the province of Babylon. It reached 6 industrial facilities for the year 2021, the number of employees reached 237, distributed over three districts. Al-Hilla District ranked first with three Industrial facilities account for 50% of the total large grain milling facilities, the number of employees reached

(125), or 52.7% of the total workers in grain milling facilities in the study area. In large enterprises, the number of employees reached (75) workers, representing 31.7% of the total employees in large grain milling facilities. Yet, Al-Musayyib district came in the last rank with an industrial facility accounting for 16.7% of the total of large enterprises, the number of employees in it reached (37) workers, accounting for 15.6 % of the total employees in large grain milling facilities in the study area.

Table (2) Large grain milling facilities in Babil Governorate by size for the year 2021.

Districts	Administrative units	Number of establishments	Percentage	No. of workers	Percentage
Hilla	Hilla Center	2	33.3	75	31.6
	Al Kifl hand	1	16.7	50	21
	Abi drowned hand				
	The total	3	50	125	52.7
Hashemite	Hashemite Center	-	-	-	
	Al-Qasim sub-district	1	16.7	35	14.8
	Medhatiya hand	1	16.7	40	16.9
	Vanguard hand	-	-	-	-
	Shomali district	-	-	-	-
	the total	2	33.4	75	31.7
Al-Musayyab	Musayyib Center	1	16.7	37	15.6
	cliff rock	-	-	-	-
	Alexandria district	-	-	-	
	the total	1	16.7	37	15.6

Source: field study.

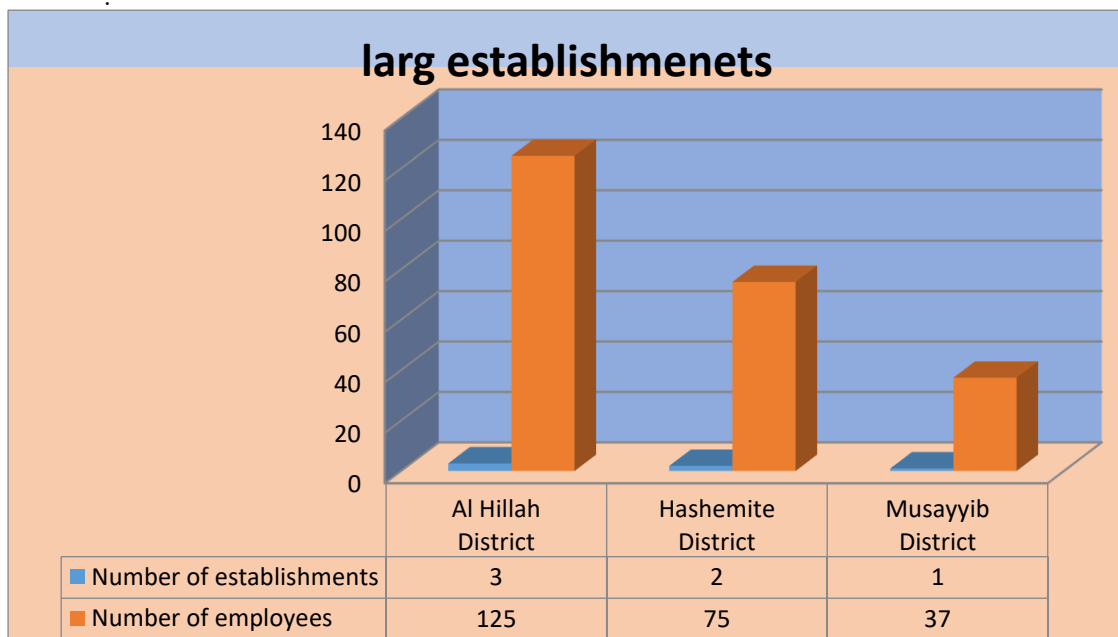


Figure (1) Large grain milling facilities in Babil Governorate by size for the year 2021  
 This figure is prepared according to Table(2)

**B - Medium grain milling industry facilities in Babil Governorate.**

Through the data of Table (3), Figure (3), which shows the medium-sized grain milling industry facilities in the province of Babylon, the number of medium-sized establishments reached (14) industrial facilities, and the number of employees reached (287) workers, distributed only in the districts of Hilla and Al-Mahaweel District ranked first with (13) industrial establishments, representing 92.9% of the total medium grain milling facilities in the study area. One industrial facility constituted 7.1% of the total medium-sized facilities in the study area, the number of workers in it reached (15) workers, representing 5.2% of the total workers in the medium-sized establishments.

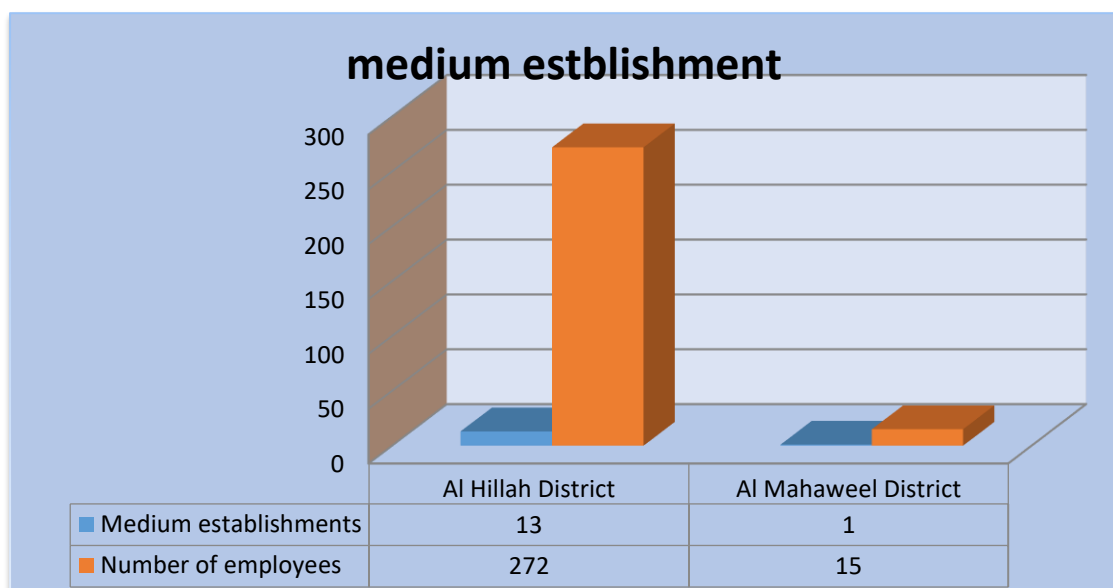
**C- Small grain milling industry facilities in Babil Governorate.**

The study showed that Babil Governorate has only one small industrial facility for grinding grain in Al-Musayyib district, and the number of employees in it is (6) workers.

Table (3) medium grain milling industry facilities in Babil Governorate for the year 2021.

Districts	Administrative units	Medium establishment	Percentage	No of workers	Percentage
Hilla	Hilla Center	13	92.9	272	94.8
	Al Kifl hand	-	-	-	-
	Abi drowned hand	-	-	-	-
Al Muhaweel	Al Mahaweel Center	1	7.1	15	5.2
	project area	-	-	-	-
	Imam district	-	-	-	-
	Nile district	-	-	-	-
the total		14	100	287	100

This table is based on the field study.



Figure(2) Medium grain milling industry facilities in Babil Governorate for the year 2021  
 This figure is based on Table(3)

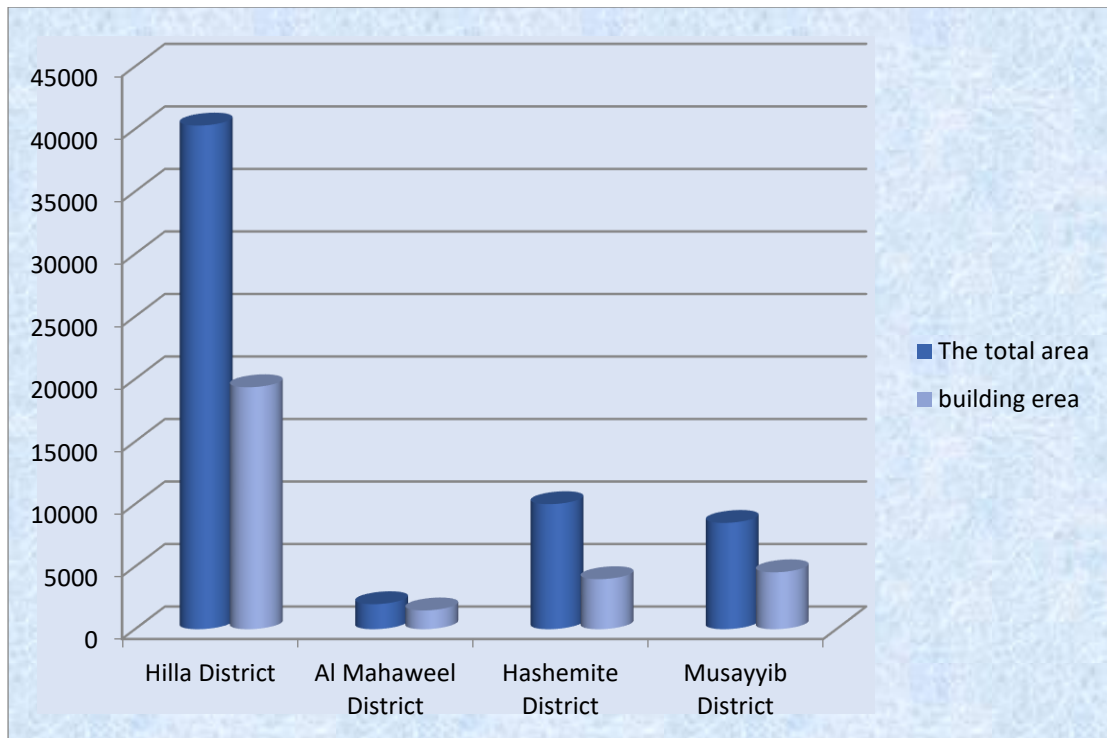
**Third - Geographical distribution of the grain milling industry in Babil Governorate on the basis of area.**

The land area is one of the important foundations for establishing industrial facilities, their locations, sizes, and their ability to accommodate industrial facilities. It varies within cities and their suburbs. Therefore, the size of industrial activity, whether facilities (large, medium, or small), is determined according to the area of land that these facilities contain. The total area occupied by grain milling facilities in Babil Governorate is 60,779 m<sup>2</sup>, while the construction area for grain milling facilities is 29,400 m<sup>2</sup>, which constitutes 48.4% of the total area. Therefore, grain milling facilities are classified according to the total area and building area.

Table (4) The total area and construction area of grain milling facilities according to administrative units in Babil Governorate for the year 2021

Districts	Administrative units	Total area m <sup>2</sup>	percentage	No. of establishment	Percentage	Building area m <sup>2</sup>	Percentage
Hilla	Hilla Center	<b>37479</b>	<b>61.7</b>	<b>15</b>		<b>18350</b>	
	Al Kifl hand	<b>2800</b>	<b>4.6</b>	<b>1</b>		<b>1000</b>	
	Abi drowned hand	-				-	
the total		<b>40279</b>	<b>66.3</b>	<b>16</b>	<b>76.2</b>	<b>19350</b>	<b>65.8</b>
Al Muhaweel	Al Mahaweel Center	<b>2000</b>	<b>3.3</b>	<b>1</b>		<b>1500</b>	
	project area	-				-	
	front side	-				-	
	Nile side	-				-	
the total		<b>2000</b>	<b>3.3</b>	<b>1</b>	<b>4.8</b>	<b>1500</b>	<b>5.1</b>
Hashemite	Hashemite Center	-				-	
	Al-Qasim sub-district	<b>5000</b>	<b>8.2</b>	<b>1</b>		<b>2000</b>	
	Medhatiya hand	<b>5000</b>	<b>8.2</b>	<b>1</b>		<b>2000</b>	
	Shomali district	-				-	
	Vanguard hand	-				-	
the total		<b>10000</b>	<b>16.4</b>	<b>2</b>	<b>9.5</b>	<b>4000</b>	<b>13.6</b>
AL-Musayyib	Musayyib Center	<b>3500</b>	<b>5.8</b>	<b>1</b>		<b>2550</b>	
	cliff rock	-				-	
	Alexandria district	<b>5000</b>	<b>8.2</b>	<b>1</b>		<b>2000</b>	
the total		<b>8500</b>	<b>14</b>	<b>2</b>	<b>9.5</b>	<b>4550</b>	<b>15.5</b>
		<b>60779</b>	<b>100</b>	<b>21</b>	<b>100</b>	<b>29400</b>	<b>100</b>

This table is based on the field study



Figure(3) Total area and building area of grain milling facilities according to administrative units in Babylon Governorate for the year 2021

This figure is according to Table.(4)

The areas occupied by grain milling facilities in the province of Babylon vary due to the different factors of their establishment, the most important of which are the state’s policy, population density, the time in which it was established, the high prices of land and the nature of industrial operations. From Table (4), Figure (3), it is clear that the grain milling facilities were distributed among the administrative units of Babil Governorate. The grains accounted for 66.3% of the total area of the grain milling facilities, and the construction area amounted to 19350 square meters, which constituted 65.8% of the total building area of the grain milling facilities in the province of Babil. The Hashemite rank second in terms of the total area occupied by grain milling facilities at a rate of 10,000 square meters, which constituted 16.4% of the total area of grain milling facilities, with two industrial facilities at a rate of 9.5% Of the total grain milling facilities, while the building area amounted to 4000 square meters, which constituted 13.6% of the total building area for grain milling facilities, and the Musayyib district ranked third in terms of the total area in the study area by 8500 square meters, or 14% of the total area of the grain milling facilities, with two facilities It constituted 9.5% of the total grain milling facilities, while it ranked second in terms of construction area at 4550 m<sup>2</sup> or 15.5% of the total building area of grain milling facilities in the study area. 3% of the total area of grain milling facilities, with one industrial facility, which constituted 4.8% of the total grain milling facilities in Babil Governorate, while the building area amounted to 1500 square meters, which constituted 5.1% of the total building area of grain milling facilities.



### **Conclusions**

- 1- The number of grain milling facilities in Babil Governorate reached (21) industrial facilities distributed among the four administrative units of Babil Governorate.
- 2- Most of the grain milling facilities are located in the center of the governorate, due to the transport and raw material factors, in addition to the state policy.
- 3- The private sector establishments constituted 5% of the total grain milling establishments, while the public sector establishments constituted 95% of the total grain milling establishments.
- 4- The field study of grain milling industry facilities showed that the geographical distribution of grain milling facilities was concentrated in the Hilla district, as it acquired 16 industrial facilities, representing 76.2% of the total grain milling facilities in the study area. 5% each, and Mahaweel District ranked third and last with one industrial facility with a rate of 4.8%
- 5- The total area occupied by the grain milling facilities in the province of Babylon amounted to 42,779 square meters, while the construction area of the milling facilities for milling grains amounted to 29,400 square meters, which constituted 48.4% of the total area

### **Recommendations**

- 1- The state should increase interest in public sector facilities in the province of Babil in order to develop the production process and build new affiliated facilities that work to meet the population's needs of flour.
- 2- The principle of planning by local governments in the process of industrial planning for its development should be used
- 3- The infrastructure of grain milling facilities, especially the old private mills have to be improved, as most of them are old and deteriorating buildings, and using modern and new machines and equipment in manufacturing operations.
- 4- Equitable distribution of grain milling facilities in Babil Governorate over different areas are is required.

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