

Spatial Analysis of Agricultural Investment in the Desert Of Muthanna Governorate for 2023.



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ABSTRACT: In nearly every nation on the planet, agriculture has an essential function and holds a prominent political and economic position, regardless of the prevailing monetary and political systems. Present-day monetary and political systems. Agriculture is a science, an art, and a practice. The more awareness among farmers, the more. It generated more profitable and high-quality agricultural products, provided new opportunities for problem-solving in the field of agriculture. Numerous geographical factors, both natural and human, affect the agriculture and production of the study area. It influences the crop productivity of the land, which in turn influences the quantity of production required to meet the demand for harvests. The research yielded many results, the most important of which is large areas remain unexploited for agricultural production. Agricultural production suffers from the impact of the desert climate on agricultural productivity. The sylvan aspect may sometimes lead to its destruction or affect output and productivity. This study came to be analyzed. And a survey of the areas cultivated with crops in the desert of Al-Muthanna Governorate. The study began with a theoretical framework. For the study, the first section studied the natural factors affecting areas planted with crops. Agriculture in the Desert of Al-Muthanna Governorate: the second section represents the human factors affecting the cultivated areas crops in the desert of Muthanna Governorate, and the third section is concerned with studying the reality of the agricultural regions for crops in the desert of Muthanna Governorate for the year 2023. The research concluded with the most important results, which are as follows: first, the prevailing pattern. Agriculture in the study area is the pattern of cultivation of fundamental crops. Additionally, the irrigation methods used are primary methods, which cause a rise in water losses through evaporation and penetration into the soil.

KEYWORDS: agricultural in the desert - agricultural investment - desert investment.

INTRODUCTION

Of production and investment of crops to ensure that they continue to meet the agricultural production needs of various crops. These issues are currently receiving attention, especially with increasing knowledge of crop production and civilized countries seeking to find the best ways to achieve that. The temporal boundaries of the study area are the study of agricultural production in the desert of Muthanna Governorate for the year 2023 AD. Research structure: The study area was divided into two sections. The first chapter studies the geographical factors that affect the cultivation of crops in the study area for 2023 AD.

RESEARCH PROBLEM

- 1-What is the impact of natural factors on crop production in the desert of Muthanna Governorate for the year, 2023?
2. How will human factors affect agricultural crop production in the desert of Muthanna Governorate in 2023?
- 3: What is the picture of the geographical distribution of crops in the desert of Muthanna Governorate for 2023?

RESEARCH HYPOTHESIS

Based on the research problem, the study assumes the following:

1. There are natural factors that affect the distribution of crops in the desert of Muthanna Governorate.
- 2: The labor force. It impacts the growth of crop offspring based on where it is accessible and where the rural population in Muthanna Governorate is concentrated.
3. There is a difference in the distribution and cultivation of crops in the desert of Muthanna Governorate, according to the factors available for its success in cultivating them.

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IMPORTANCE OF RESEARCH

The importance of research comes from the importance of producing crops, which constitute the basis for providing materials, the main food item in Muthanna Governorate, and it also provides job opportunities for many residents of the governorate, especially since it suffers from a high unemployment rate.

SEARCH GOAL

The research aims to study the reality of agricultural crop production in the desert of Muthanna Governorate.

And how to distribute this pattern according to the natural and human conditions suitable for each crop, as well as knowing the problems facing these crops, finding appropriate solutions to them, developing the optimal method to improve the nature of the organization and planning for agricultural development, and using scientific techniques and introducing them into various sylvan operations.

RESEARCH METHODOLOGY

The research followed a regional approach in describing the phenomenon within the Muthanna Governorate region.

SEARCH LIMITS

The spatial boundaries of the research are the administrative borders (in the desert of Muthanna Governorate) and the regions. The southwestern part of the governorate ⁽¹⁾, map (1).

This research aims to analyze the production of farm crops of all kinds in the study area for 2023 AD and know the natural factors that affect these crops. Research problem: What is the effectiveness of natural factors on agricultural production in the study area for the year 2023 AD?. The second section discussed how human factors affect crop cultivation in the Muthanna Governorate's desert. The third section examined the spatial distribution of crops in the desert for 2023. The conclusion included sources, recommendations, and conclusions. And references.

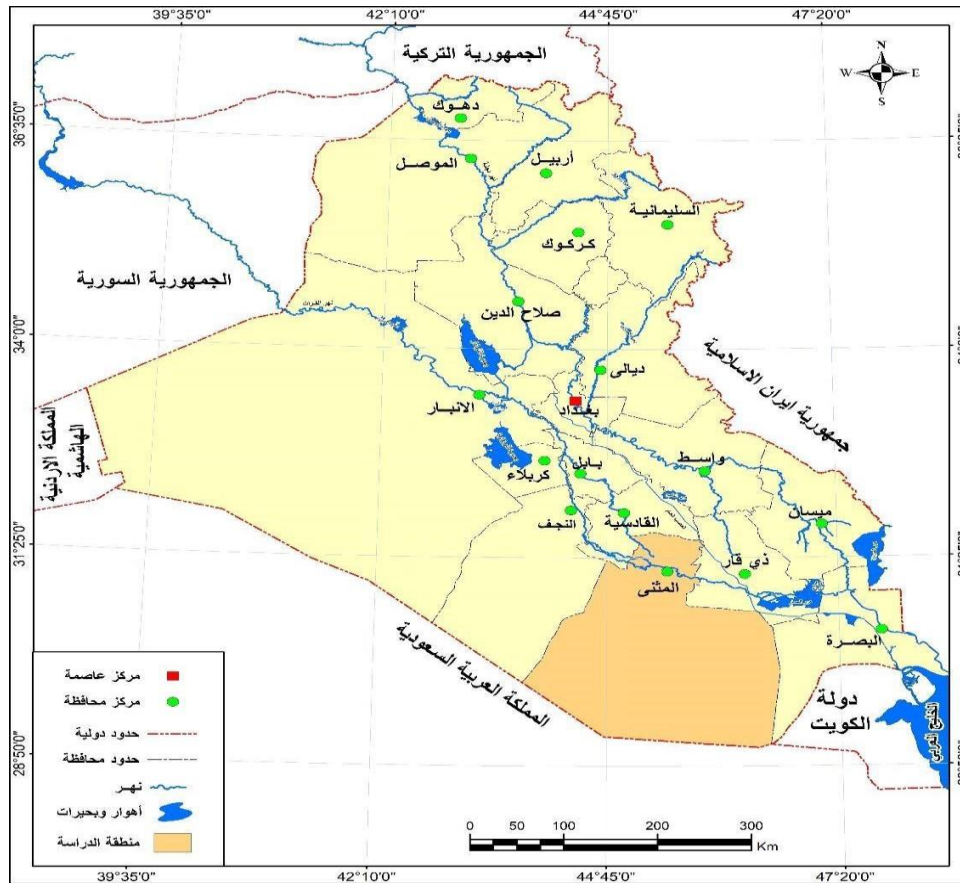
THE FIRST TOPIC

Natural factors affecting agricultural crop production in the desert of Muthanna Governorate.

Natural factors significantly affect the production of crops because they directly affect species, agricultural production, distribution, and identification of crops ⁽²⁾ The most important natural factors affecting the distribution of agricultural production are the following:

1. Surface: The primary focus of the study is the flat, slope-free surface of Al-Muthanna Governorate, devoid of fossilization. The majority of the governorate, which is 46935 km² in size and lies in the southwest of the alluvial plain, is desert. The primary focus of the study is the flat, slope-free surface of Al-Muthanna Governorate, which is devoid of fossilization. The Al-Muthanna Governorate is primarily made up of deserts and is in the Western Highlands region. It is located in the southwest of the alluvial plain region and covers an area of 46935 km². ⁽³⁾ With a percentage of 90.7% of the Muthanna Governorate's total area, its surface is unique due to regional variations. The lower valleys region, which stretches from the Shatt to the western banks of the Euphrates River, is divided into three distinct natural divisions ⁽⁴⁾. The portion of the town south of Al-Atshan. The Al-Hajar region is represented by the second portion of the plateau ⁽⁵⁾, which is situated in the center. The third section, the Al-Dabdaba area, is where water enters the valley from the northeast to the southwest. It is situated far to the southeast of the desert plateau. Wadi Al-Batin is the valley at the very front. Wadi Al-Batin is the valley at the very front ⁽⁶⁾. The aforementioned makes it abundantly evident that the Al-Muthanna Governorate's surface, despite its varied cross-section, is not seen as a barrier to agricultural production activities because it has a gradual slope that varies with the area. They slope in terms of types. Al-Muthanna Governorate is considered the alluvial plain to be the most suitable for agriculture because agricultural work there is easy, sylvan machinery is readily available, only the exterior of the land is flat, and the geographical conditions are not available. Slopes lead to poor natural drainage and are a factor in soil salinization problems.

Map (1) Geographical location of Al-Muthanna Governorate



2-THE CLIMATE

It is regarded as one of the natural variables influencing agricultural production and distribution, as the Al-Muthanna governorate has a dry climate. As such, agriculture productivity in the desert governorate is affected by the restricted climates; among the climatic elements, the middle intelligence in the idiom of annual theoretical solar radiation was 12.03 hours per day from 1989 to 2023, and the academic daylight hours began to rise slowly. While actual sunshine hours reach 8.5% hours/day during the summer planting season, which starts in April, they spread 12.5% hours/day during the winter growing season, when they reach 6.2 hours. In data for December/day, March had the highest recording rate, connecting 8.6 hours/day.

As for the summer agricultural season, the highest average of actual brightness hours was recorded in July, reaching 11.8 hours per day, while April recorded the lowest average of actual brightness hours, at 8.7 hours per day. Table (1).

Table 1: Monthly and annual averages of theoretical and actual hours of sunshine (hours/day) for Samawa station for the time 1989–2023.

Table (1) Monthly and annual averages of theoretical and actual hours of sunshine (hours/day) for Samawa station for the period (1989-2023)

| The Months | Solar radiation angle rates (degree) | Theoretical hourly rates | Actual brightness hours rates |
|------------|--------------------------------------|--------------------------|-------------------------------|
| January | 38,9 | 10:2 | 6:5 |
| February | 41,8 | 10:5 | 7:6 |
| march | 57 | 12:5 | 8:6 |
| April | 69,9 | 12:5 | 8:7 |
| may | 76,3 | 13:2 | 9:1 |
| john | 82,3 | 14:1 | 11:7 |
| jolly | 78,5 | 12:2 | 8:11 |
| August | 71,8 | 12:1 | 9:1 |
| September | 52,9 | 11:5 | 8:8 |
| October | 48,9 | 10:4 | 7:6 |

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| | | | |
|--------------------|------|------|-----|
| November | 35,2 | 10:3 | 6:6 |
| December | 35,5 | 10:2 | 6:2 |
| The average Annual | 58,5 | 11:6 | 8:5 |

Source: General Authority for Meteorology and Seismic Monitoring, Baghdad, unpublished data, 2020

Unless Month Radiation angle rates. Hourly rates this Voluntarily Mcountingno Actual brightness hours

Source: General Authority for Meteorology and Seismic Monitoring, Baghdad, unpublished data, 2020

It is clear from the above that changes in sunshine hours, as they increase in the hot season and decrease in the cold season, impact the diversity of crops grown in the study area, and thus summer and winter crops are also affected. The plant is grown throughout the governorate, where a desert climate prevails. However, increasing daylight hours may increase the length of the heat acquisition period and thus increase heat gain. Summer evapotranspiration and soil moisture content decrease, and crop water consumption increases.

As for temperatures

This element is considered one of the most important climatic factors affecting crop growth and distribution Geographic, as it determines the types of crops to be grown, and crop cultivation in the region changes according to the time of year. Temperature determines the length of the crop growing season. Temperature directly and indirectly affects plant growth because it affects wind speed and direction, relative humidity, and evaporation process. The higher the temperature, the greater the evaporation rates, which leads to the drying of the soil and a rise in the percentage of salts in it, making it unsuitable for agriculture ⁽⁷⁾.

From the above, it is clear that seasonal changes provide agricultural production opportunities for all types of crops in the desert of Muthanna Governorate, but evaporation, and transpiration rates increase during hot seasons and cause damage to some crops, in addition to increasing the evaporation rate of irrigation water and increasing water loss.

When it comes to rain, the impact of precipitation on domesticated plants and their distribution across the earth's surface comes first. Factors affecting growth: For the plant to grow and perform its fundamental functions, it needs a specific amount of rain. These are not the same.

The amounts vary amongst plants. For example, wheat needs at least 400 millimeters of precipitation annually nevertheless. Barley requires 350 mm, but yellow corn requires 1100 mm, which is more. As it usually starts at the end of October and gets heavier, the study area rainfall is typically low in quantity. It builds gradually and peaks in January and February. There are variations in the amount of rainfall in the study area. Annually, this fluctuation and lack of rain negatively affect agricultural activity, especially in some areas. That is relatively dependent on agricultural activity. On rainwater, such as growing wheat and barley crops. However, rains still have positive effects in the region. It contributes to reducing the need for irrigation winter crops in the governorate.

As for the Wind

It's regarded as of great importance for the pollination process of some genders of plants, and it also plays a role in regulating pollination. In areas of agriculture that receive irrigation, humidity aids in the winnowing process and may harm crops.

Concerning relative humidity

There is a variation in the rates of relative humidity during the summer and winter seasons, and it is characterized by its increase during. January and December had the two highest rates during the winter, at coming, 64.4% and 61.6%, respectively. While the ranking rises with rising temperatures in the summer, it reaches its lowest rates in July and August, reaching 22.5 and 24.3%, respectively.

According to the data above, relative humidity rises significantly more in the winter than increases in the summer because it influences plant requirements and agricultural output in both the summer and the winter. For water, given their glaring disparities. 3-The soil depends on the main factors of its formation, origin, and settlement area, and two kinds of soils arise: alluvial soils and sedimentary soils.

Desert ⁽⁸⁾. The alluvial soil is located in the northern part of the governorate and can differentiate itself by a deep and uniform soil texture, and its particles are quite small.

General and the coarsest sand is. It is accessible on either side of the Saber and Thirsty rivers, the Euphrates, and its two principal tributaries ⁽⁹⁾. Usually, it is dune soil. Although the dunes endanger crops, the sand is unsuitable for agriculture without the addition of chemical and fertilizer fertilizers. However, the soil in the river basins, which cover a significant portion of the region, is good ⁽¹⁰⁾. The south and southwest are the primary regions where desert soils have lately. The study area is west of the Euphrates River, where high evaporation rates and insufficient annual rainfall hurt plant life ⁽¹¹⁾. You swear. This soil has split into gypsum desert soil, stony desert soil, flood soil, and valley bottoms ⁽¹²⁾. It is clear from the above that the soil of the shoulders of the rivers and the soil of the river basin are of particular importance in agricultural production and the concentration of production operations there, as it is characterized by its high production potential and its suitability for all types of crops, as well as the sandy soil in the Western Plateau, as it has become at the forefront of areas producing fodder crops based on sprinkler irrigation.

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Water resources Since

The study area is known for its desert climate and lack of rain, it depends on irrigation. The groundwater route in the study area is.

Underground water: Groundwater is portrayed by springs and springs, including Ain al-Battah in the Ghadhari area, Ain al-Jiyad, Ain al-Ghadhari, Ain Hammoud, and Ain Sayed. In the Al-Rehab area ⁽¹³⁾ as for the wells, they are widely spread in the desert of Al-Muthanna Governorate and are mainly concentrated in the western Plateau region, represented by the Al-Salman area.

THE SECOND TOPIC:

Human factors affecting agricultural investment in the desert of Muthanna Governorate

1-Labour: Many crops depend heavily on labor, and labor must be primarily available for agriculture. The agricultural areas are directly linked to the abundance of labor, which determines labor intensity for the administrative unit. Quality crops agricultural knowing the role of labor in agricultural production, we can clearly understand the importance of labor because it affects the volume and change in distribution.

The rural population is within the governorate and administrative unit level, so the population is mainly concentrated in rural areas, as they are centered. In Samawa district in the first place, and this is. Help to provide staff highly. As for agricultural density, it becomes clear that there is a variation in agricultural density at the level of administrative units in the year (2023), and this is due to the variation in the actual cultivated area for each administrative unit in the study area.

2- Irrigation methods: Intermediate irrigation may currently be the only prevailing method in the governorate, but it varies spatially. The region is characterized by several methods and, methods for irrigating agricultural holdings, and we will study each mode with an explanation of Its importance as follows ⁽¹⁴⁾:

- The flow of water through lines or basins, based on the substrate's level and inclination, is known as the flood irrigation method. In this way, basins or lines are completely irrigated, and water is added to weak ground ⁽¹⁵⁾. And that space. Lands irrigated by flood reach (129,277) dunums, and the lowest percentage is in (Al-Muthanna Desert), as it reached (17.31) %.
- **Sheet irrigation method:** The area of land irrigated with panels reaches (397590,2) acres lost. The score of Badia Al-Muthanna came in first place, with a percentage of (78.58) %.
- **Water irrigation method:** The total area irrigated in this way amounted to (163078.5 dunums when it came, Badia Al-Muthanna ranked first, with a percentage of (78.94) % ⁽¹⁶⁾.

THE THIRD TOPIC:

The reality of areas cultivated with crops in the desert of Muthanna Governorate in 2023.

The study area's natural and human factors influence the different uses of farming lands, and their uses vary based on those factors. Numerous characteristics make up the economic significance of crops in the Muthanna desert and agricultural tenure, which have been considered one of the main factors influencing these uses. The following crops are suitable for research because leased agricultural landings are primarily grown for these crops. However, owned lands have varying investment patterns and can be grown for field crops, horticulture, or vegetables. Parts of the land remain uncultivated:

1-Summer crops:

According to reports, the study area's cultivated area for (2022–2023) was (15,345) dunums. The table below demonstrates that the largest crop grown in the area is water cucumber, which grows on (580) dunums, while white corn is grown on (11) dunums.

2-Winter crops:

It is reported that, for 2022–2023, the study area's cultivated areas totaled roughly (263,795) dunums. The predominant crop in the region is wheat, which is grown on (30,000) acres of land that is irrigated by irrigation systems and (213,000) dunums, that are irrigated by tourists. With a total acreage of roughly (445) wheat is the tiny crop in the modern village area that relies on tourist irrigation. There were nearly (233) irrigation systems in total, spread across multiple locations. There are diverse types found in the Muthanna desert, such as a fixed type that feeds (42) dunums and approximately (21) systems, including linear ones that feed approximately (86) dunums.

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Table 2: Summer crops started growing in the desert areas of Muthanna Governorate in 2023.

| Administrative | White corn | Forage White corn | Yellow corn | Eggplant | Watermelon | Smoke | Tomato | Water | Upgrade | Onion | Jet plant | The average |
|--------------------|------------|-------------------|-------------|----------|------------|-------|--------|-------|---------|-------|-----------|-------------|
| Salman | 300 | 200 | 580 | 11 | 125 | 500 | - | - | 175 | - | 25 | 1,791 |
| potions | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| The modern village | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| The average | 300 | 200 | 580 | 11 | 125 | 500 | 0 | 0 | 175 | 0 | 25 | 1,916 |

Source: The researcher, relying on the Directorate of Agriculture in Al-Muthanna Governorate, Planning and Follow-up Department, Plant Production Division, unpublished data, 2023.

Table (3). Areas cultivated with winter crops in the desert of Muthanna Governorate for 2023.

| Administrative | White corn | Forage White corn | Yellow corn | Eggplant | Watermelon | Smoke | Tomato | Water | Upgrade | Onion | Jet plant | The average |
|--------------------|------------|-------------------|-------------|----------|------------|-------|--------|-------|---------|-------|-----------|-------------|
| Salman | 2000 | 8000 | 3000 | 10 | 200 | 1000 | 10 | 5 | 550 | 150 | 100 | 15025 |
| potions | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 20 |
| The modern village | 0 | 0 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 300 |
| The average | 2000 | 8000 | 3300 | 10 | 200 | 1000 | 10 | 5 | 550 | 150 | 120 | 15345 |

Source: The researcher relies on the Directorate of Agriculture in Al-Muthanna Governorate, Planning and Follow-up Department, Plant Production Division, unpublished data, 2023.

CONCLUSIONS AND SUGGESTIONS

First Conclusions.

Through the above research, it is possible to make a few choices, the most important of which are:

1. Because of the dry weather and irregular rainfall in the Muthanna Governorate, the cultivated areas in the desert are chosen based on the availability of water resources.
2. Different crop types are cultivated in the desert according to the availability of water required for each crop type, soil type, and physical and chemical properties; for example, the most drought-tolerant barley crop is grown in the center of the Salman district.
3. The primitive irrigation techniques used in the desert increase water losses through evaporation and deep soil penetration, potentially leading to an increase in soil salinity alongside other issues.

Second: Recommendations

- 1- The trend towards expanding agricultural areas with crops by taking advantage of groundwater in The Badia region, and even in the alluvial plain area, by benefiting from modern irrigation methods, especially sprinkler irrigation. And distillation.
 - 2- Educate the farmer swiftly and introduce him to the water requirements required. Crops to prevent wasting unnecessary irrigation water.
- Decrease the problem of water loss and the resulting trouble such as (the problem of soil salinity).
- 3-Due to the limited agricultural area within the boundaries of irrigation. Earnings may increase through growth. Al-Amoudi, by increasing productivity per unit area through the use of superior varieties of crops, with the use of Fertilizers and pesticides and focus on growing high-productivity crops.

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