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Agriculture in the Central Maghreb Between Traditional Heritage and Andalusian Influence from the 2nd to the 10th Century AH

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Abstract:

Agriculture is the backbone of the economic structure and the cornerstone of people's lives throughout different eras. This field has undergone significant changes in its features depending on each period, and land and agriculture have been closely linked to the development, progress, and political stability of nations. Undoubtedly, like other countries, the Central Maghreb paid great attention to this field, and this expertise stemmed from the deep-rooted connection of the land in the minds of the region's inhabitants. Their traditional heritage included various methods and techniques for dealing with and cultivating the land according to their needs and requirements. Although these techniques may appear superficial to the observer, they effectively met the needs of the local population with the resources available in their land. They domesticated animals for plowing and used tools such as plows, shovels, threshing boards, sickles, and others. Their knowledge expanded with the influence of Andalusia on the people of the Central Maghreb. While agricultural work was initially based on simple tools without much depth, the inhabitants of the region later gained expertise in different types of land, identifying suitable crops for each type and the appropriate seasons for planting. They also advanced in developing irrigation methods, an area in which the Andalusians excelled. The Andalusians gained renown for their expertise in this field, producing scholarly works that focused on soil, plowing, and the types of fertilizers suitable for different lands. The impact of this knowledge was evident in the Central Maghreb, which absorbed and applied these agricultural advancements throughout successive states.

Keywords: Agriculture, Central Maghreb, Andalusia, Heritage, Plowing, Fertilization,

Threshing, Land, Animals, Fertilizers.

Introduction

The geographical domain of the Central Maghreb was distinguished by natural features that facilitated its focus on agriculture. This, in turn, played a significant role in the rise and prosperity of most civilizations that succeeded one another in the Central Maghreb. This was noted in the writings of historians, travelers, and geographers who mentioned the region in their works. Given the availability of agricultural resources and the local population's interest in farming as a civilizational heritage, a type of fusion emerged, creating both a cultural and economic image simultaneously. Naturally, the inhabitants adapted this vital resource according to their needs, relying on both natural and human components. Over time, a cultural blend developed between the Central Maghreb's traditional agricultural heritage and another civilizational influence from Andalusia, leading to the emergence of a new agricultural pattern fundamentally rooted in the fusion of these two cultural elements.

On this basis: How can we highlight the difference between the traditional agricultural heritage of the Central Maghreb and the Andalusian influence? And what are the most significant influences introduced into the agricultural field?

The Central Maghreb was an agricultural land, and those who settled there had no choice but to engage in farming. The early inhabitants of this region lived a primitive life, without a fixed abode. As their numbers grew and they discovered various useful crops, they settled in specific areas, began cultivating the land, and engaged in farming¹. The ancient periods were marked by a transition from hunting, gathering, and foraging—practices that persisted until stability was achieved—gradually leading to a connection with the land. Over time, they engaged in herding and seasonal agriculture², which stemmed fundamentally from human nature, as agriculture was a crucial activity that connected them to the land, which represented their livelihood.

According to Bouglé, in his analysis of this form of human activity, he considered it a visual representation added to the real domain of social imagery³. Regarding those engaged in agriculture, it was natural for some people to cultivate their own land and take care of it, or work as laborers for large landowners. However, it appears that some individuals from other professions and trades also showed interest in this field, following updates and news about rainfall and crops.⁴

When discussing agriculture in the Central Maghreb, we find ourselves exploring an economic activity of great antiquity. S. Crsell emphasized that certain peoples practiced agriculture from very early times. The cultivation of grains was introduced to Berber lands long before the Phoenician settlement, and land reclamation took place over an extended period. Wheat and barley were among the most commonly grown crops, and

¹ Adel Abu Al-Nasr, *History of Ancient Agriculture*, 1st edition, Agricultural Union Company, Beirut, 1960, p. 12.

² Rachid Al-Nadhour, *The Greater Maghreb*, Vol. 1, National Printing and Publishing House, Cairo, 1966, p. 124.

³ Lucien Febvre, *Earth and Human Evolution*, translated by Mohamed El-Sayed Ghallab, 2nd edition, New Publications House, Cairo, 1973, p. 79.

⁴ Qadi Iyad, *Tartib al-Madarik wa-Taqrif al-Masalik li-Ma'rifat A'lam Madhhab al-Imam Malik*, edited by Abdelkader Al-Sahrawi, 2nd edition, Vol. 3, Ministry of Endowments and Islamic Affairs, Rabat, 1983, p. 92.

wheat ears were even depicted on the coins of some kings⁵, reflecting their interest in this vital field. They also imposed the Annona tax, which was crucial for Roman emperors.⁶ Archaeological data from the region indicate the presence of human groups that settled along rivers, springs, oases, and salt lakes, where they practiced primitive agriculture.⁷ There is no doubt that agricultural work gradually evolved, especially after the domestication of animals and the discovery of metals, which allowed for the use of heavier tools. The axe grew larger until it became a plow that could dig deeper into the ground, revealing its hidden fertility.⁸

Traditional Agricultural Heritage in the Central Maghreb:

The Central Maghreb region was distinguished by a rich civilizational heritage, particularly in agriculture, which was the primary source of livelihood for its inhabitants. Farming methods were initially very simple. The process began with soil turning, known as "miyali", where the landowner started plowing in stages using a plow made of wooden parts and an iron "sikka" (plowshare)⁹. A "zawj" (a pair of oxen or cows)¹⁰ was also used for plowing.

There was not much difference between medieval plowing techniques and traditional plowing methods today, except for a few variations, such as the use of donkeys instead of cows. This was mentioned in *Description of Africa* by Leo Africanus, who noted that in the Haha region, plowing was done exclusively with donkeys or horses.¹¹

The shovel (*jarouf*) was also used for plowing and was specifically used for planting. It is a tool consisting of a rectangular iron piece attached to an animal that pulls it, while the

⁵ S. Crsell, *Histoire Ancienne de l'Afrique du Nord*, Vol. 5, Haan, Hachette, Paris, 1927, pp. 160-162, 163.

⁶ Mohamed Al-Bashir Al-Shaniti, *Economic and Social Changes in Morocco During the Roman Occupation and Their Role in the Events of the Fourth Century AD*, National Book Foundation, Algeria, 1984, p. 37.

⁷ Mohamed Al-Saghir Ghanem, *Cirta Numidia: Origin and Development*, Dar Al-Huda, Ain M'lila, 2008, p. 178.

Will and Ariel Durant, *The Story of Civilization: Our Oriental Heritage*, introduction by Mohieddin Saber and Zaki Naguib Mahmoud, Vol. 1, Dar Al-Jil, Lebanon, 1988, p. 17.

The Mi'yali (or plow) is a tool consisting of a conical-shaped iron blade, sharp at the bottom and widening as it ascends. It has two wings and is attached to a wooden frame on which the laborer presses while plowing. The most suitable animals for pulling it are oxen, as they are capable of drawing it efficiently.

⁸ With strength, depth, slowness, and ease of control during plowing, making it easier to maneuver. See:

Mohamed Hassan, *Types of Agricultural Techniques in the Islamic World During the Medieval Era*, supervised by Hassan Hafizi Al-Alawi, Okaz Publications, 2011, p. 274.

⁹ Ibid., p. 268.

¹⁰ Al-Barzali (d. 841 AH), *Al-Barzali's Fatwas*, presented and edited by Mohamed Al-Habib Al-Hila, 1st edition, Dar Al-Gharb Al-Islami, Beirut, 2002, Vol. 3, p. 267.

¹¹ Hassan Al-Wazzan, *Description of Africa*, translated by Mohamed Haji and Mohamed Al-Akhdar, 2nd edition, Dar Al-Gharb Al-Islami, Beirut, 1983, Vol. 1, p. 97.

farmer directs it to move the soil from elevated or low areas¹². In addition to the shovel, secondary tools were used, such as brooms made from grasses or thorny plants to move the seeds, cover them, and protect them from birds. The selection of seeds was based on their quality and type¹³.

It seems that agricultural work in the Central Maghreb was based on the three-field crop rotation system, where the land was divided into fallow, newly plowed, and cultivated land. Although fallow land was naturally fertile, it required plowing and weeding to be suitable for some crops. This process was exhausting but unavoidable, as some crops, such as wheat and lentils, could only grow in well-plowed soil.¹⁴

The threshing sledges (*madarat*) were used to transport the harvested crops to the threshing floor, where they were also used to separate the grain. Hand mills were used for grinding wheat and barley.¹⁵

For the harvest, sickles were used, including the harvesting sickle and the pruning sickle.¹⁶ Other tools were also used, such as the *tabanada*, a leather apron worn by harvesters to protect them from thorns, and wooden or reed finger covers placed on the left hand to protect it from the sickle's blows. The harvesting process differed according to the region:

- In small farms, oases, and mountainous areas, crops were uprooted manually.
- In large estates, the harvest was carried out by hiring harvesters for a payment in kind or money, or through tribal cooperation.¹⁷

Ibn Bassal mentioned sharp sickles, but not in the context of harvesting; rather, he referred to them in the pruning of tree branches. Al-Tighnari also mentioned sickles in two places in his book *Zahr al-Bustan*: once in the context of harvesting, and the second in reference to cutting vines.¹⁸

The final stage of the agricultural process was threshing, where threshing sledges (*madarat*) or winnowing forks (*mijrāfa*) were used. These were made from hardwoods such as boxwood and wild olive, or from more easily shaped woods like cedar and juniper. Ibn Khaldun describes agriculture as “a craft whose purpose is the production of

¹² Mohamed Hassan, *Ibid.*, p. 275.

¹³ Abu Al-Ma'ati Mohamed Abbasi, *Agricultural Estates and Their Impact in Morocco and Al-Andalus (238 AH – 488 AH / 852 AD – 1095 AD): A Comparative Historical Study*, Vol. 2, PhD dissertation, Department of Islamic History and Civilization, Faculty of Dar Al-Uloom, Cairo University, 2000, p. 429.

¹⁴ Ezzedine Amid Ahmed Moussa, *Economic Activity in the Islamic Maghreb in the 6th Century AH / 12th Century AD*, PhD dissertation, American University of Beirut, 1975, p. 240.

¹⁵ Abdelmalek Bakkai, *Ibid.*, p. 215.

¹⁶ Youssef Takadi, *Ibid.*, 1st edition, p. 115.

¹⁷ Youssef Nkadi, *Agriculture in Al-Andalus During the 5th Century AH*, 1st edition, Al-Jisour Printing House, Oujda, 2007, p. 115.

¹⁸ Abdelmalek Bakkai, *Rural Life in the Central Maghreb from the 7th to the 10th Century AH / 13th to 16th Century AD*, PhD dissertation in Islamic History, supervised by Massoud Mazhoudi, University of Hadj Lakhdar, Batna, 2014, p. 215.

food and grains by cultivating the land, tending to plants with irrigation, then harvesting the crops."¹⁹

Although geographical sources did not mention much about agricultural tools in the Central Maghreb—perhaps because they focused more on general agricultural life and were impressed by the region's crops—some legal sources did note details. For instance, Al-Wansharisi mentioned that manure (*zibāl*) was bought and sold for fertilization purposes.²⁰

In conclusion, agricultural work in the Central Maghreb followed a sequence of stages:

1. Preparing the land, which varied in fertility from one area to another.
2. Plowing the land using a plow drawn by oxen or mules.
3. Fertilization, adding different types of manure to improve soil fertility and yield.
4. Selecting the best seeds for planting.
5. Harvesting and threshing the crops.
6. Storing the produce after processing.

Andalusian Influences on Agriculture in the Central Maghreb:

The Andalusian Influence on the people of the Central Maghreb led to their increased knowledge and expertise in agricultural techniques and their growing interest in farming, particularly in garden organization and rose cultivation²¹. They adopted various land management and exploitation methods from Al-Andalus, especially during the 5th and 6th centuries AH, implementing the following techniques:

1. The Three-Field Crop Rotation System, dividing land into three categories: fallow (uncultivated), plowed (tilled but not planted), and cultivated (actively farmed).
2. Rain-fed agriculture, where land was left fallow for at least one year every two years, during which livestock grazed on naturally growing short grasses.²²
3. Plowing at the appropriate time using oxen for farming.
4. Fertilization (*tazbil*), ensuring the land remained fertile.
5. Understanding plant compatibility (*composition or grafting*), meaning knowledge of which fruits and crops thrived best based on location and season.

¹⁹ Youssef Nkadi, *Agriculture in Al-Andalus*, 2nd edition, Center for Andalusian Studies and Civilizational Dialogue, Casablanca, 2009, p. 96.

²⁰ Abdul Rahman Ibn Khaldun, *Al-Muqaddimah*, edited and studied by Ahmed Al-Zaabi, Dar Al-Huda, Ain M'lila, 2001, p. 442.

²¹ Al-Wansharisi (d. 914 AH), *Al-Mi'yar Al-Mu'arab wa Al-Jami' Al-Mughrab on the Fatwas of the People of Ifriqiya, Al-Andalus, and the Maghreb*, Vol. 8, Moroccan Ministry of Endowments and Islamic Affairs, Rabat, 1981, p. 337.

²² Saleh Mohammed Fayadh Abu Dayak, *Agriculture in Al-Andalus and Its Impact on Agricultural Manufacturing*, *Al-Mu'arrikh Al-Arabi* Journal, Issue 44, General Secretariat of the Union of Arab Historians, Baghdad, 1991, p. 208.

6. Harnessing and storing water, including water collection and conservation.²³
7. Advancing irrigation systems, especially considering climate fluctuations (such as summer droughts) and the scarcity of groundwater. To meet their water needs, farmers in the Central Maghreb relied on several storage methods near farms and urban areas, using containers, reservoirs, and basins.²⁴
8. Land suitability testing:
 - For infertile land unsuitable for planting, three test pits (each 1.5 cubits deep) were dug at different locations. The extracted soil was carefully collected in clay vessels. If, after filling the pits with looser soil, some soil remained unused, this indicated excessive compactness, making the land unfit for cultivation.²⁵
 - Moderately fertile land was considered suitable for vineyards.

Soil Management Methods

Soil is constantly exposed to the risk of pests, natural disasters, and infertility, leading to agricultural stagnation, economic difficulties, and reduced crop yields. These challenges could hinder farmers' ability to maintain their work²⁶, making soil care and problem-solving essential.

Agricultural scholars dedicated entire studies to soil treatment. The similarities²⁷ between the southern and eastern terrains helped in developing shared solutions that influenced farmers in the Central Maghreb. The diverse and inconsistent soil types in the region created an opportunity for extensive research on soil care and treatment, particularly through fertilization (*tazbil*).

Ibn al- 'Awwam noted that manure (*zibāl*) enhances the fertility of already fertile land, while it greatly improves poor soil by strengthening it. He emphasized that weak, thin soil requires larger quantities of manure and that bird manure²⁸, particularly from pigeons, was most effective for this purpose.

²³ Levi-Provençal, *The History of Islamic Spain: From the Conquest to the Fall of the Cordoban Caliphate (711–1031)*, translated by Ali Abdul Raouf Al-Bambi, Ibrahim Al-Manouni, and others, Supreme Council for Culture, Cairo, 2002, pp. 233–235.

²⁴ *Ibid.*, p. 240.

²⁵ Sanaa Atabi, *Water Utilization in the Central Maghreb Through Jurisprudential Sources*, *Maghreb Awsatiyyat* Journal, supervised by Alaoua Amara, Iqra Library Publications, Constantine, 2013, p. 199.

²⁶ Ibn Al-Awwam Al-Ishbili, *Kitab Al-Filaha (The Book of Agriculture)*, translated by Don Josef Al Castellano, Madrid, Aexpensas de la Real Biblioteca, Vol. 1, Antado, 1802, pp. 80–81.

²⁷ Ibrahim Al-Qadiri Bouchich, Abdelhadi Bayad, *Soil: Its Pests, Treatment Techniques, and Management in Light of Andalusian Agricultural Literature of the 5th/11th Century*, in *Agricultural Techniques in the Islamic World During the Medieval Era*, supervised by Hassan Hafizi Aloui, King Abdul Aziz Al Saud Foundation, Casablanca, 2011, p. 222.

²⁸ Levi-Provençal, *Ibid.*, p. 76.

However, some types of manure were harmful to the land. For instance, waste from water birds such as ducks and geese was destructive to plants and could burn the soil.²⁹

Soil in the Quran

The Quran references different types of land, emphasizing their distinct characteristics:

- Some land is unsuitable for cultivation, while others are fertile and productive. As Allah states:

"And the good land—its vegetation emerges by permission of its Lord, but that which is bad does not produce except sparsely³⁰." (*Surah Al-A'raf*, 7:58)

- The Quran also highlights the revival of barren land through water, symbolizing agricultural renewal and resurrection:

"And among His signs is that you see the earth still, but when We send down water upon it, it stirs and grows. Indeed, He who has given it life is the Giver of Life to the dead. Indeed, He is over all things competent." (*Surah Fussilat*, 41:39)³¹

Geographers praised the land of Al-Andalus for its abundant agricultural production. Andalusian scholars classified soil types, identifying those suitable for cultivation and those requiring fertilization and treatment. Their studies distinguished several soil categories, including: brown, black, white, mountainous, red, yellow, coarse, and soft soils³².

To ensure proper soil care, agricultural experts advised against using freshly disturbed soils, as their high temperature could penetrate and damage both soil and plants. Additionally, these soils retain excessive moisture, making them a breeding ground for harmful insects that threaten crops.³³

A summarized classification of soil types, their characteristics, and the crops best suited for each—based on the book *Bughiyat al-Fallahin*—is presented in the following table:

Soil Type	Quality & Characteristics	Suitable Crops
Soft Soil	Moderate, retains moisture and coolness	Most trees and plants
Dense Soil	Rich, retains moisture and warmth	Grains and plants
Saline Soil	Medium-quality, mix of heat and coolness	Date palms
Mountainous Soil	Similar to soft soil, cool and dry	Almonds, figs, pistachios, oak, chestnuts, pine, grains, and various crops
Sandy Soil	Balanced, combines heat and coolness	Figs, peaches, pomegranates, roses, plums, mulberries, quinces, vegetables
Black Clay Soil	A mix of heat, dryness, and	Fava beans, flax, mustard, coriander, jujube,

²⁹ Ibn Al-Awwam, *Ibid.*, pp. 98–99.

³⁰ Surah Al-A'raf, Ayah

³¹ Surah Fussilat, Ayah 39.

³² Unknown author, *History of Al-Andalus*, edited by Abdelkader Boubaïa, Dar Al-Kutub Al-Ilmiyya, Beirut, 2007, p. 42.

³³ Youssef Nkadi, *Ibid.*, 2nd edition, p. 79.

Soil Type	Quality & Characteristics	Suitable Crops
	salinity	pomegranates
White Soil	More cold than dry	Grass, trees, vineyards, figs, olives, almonds
Red Soil	Thick, with a mix of warmth	Trees, plants, apples, pears, mulberries, almonds
Gravelly Soil	A mix of coolness and dryness	Almonds, pistachios, figs, olives, pears, grapes, pumpkins, eggplants, roses
Reddish Soil	Hard, requires more labor, mix of coolness and dryness	Trees (but not plants)

Plowing Methods

The timing of plowing was extensively documented in agricultural manuals and held a significant place in their studies. Ibn Luyun outlined the agricultural calendar in his poetic verse:

*"The first plowing is set in January,
The second in March, don't tarry.
The third should be in May performed,
And June completes the work confirmed."³⁴*

Generally, farming tools were primarily made of iron and had Andalusian linguistic roots, influenced by Spanish and Arabic dialects. Some notable tools included:

- **Al-Marjfal** (*Murciélago* in Spanish, meaning "bat") – Used to regulate water levels.
- **Shinjūl** – A tool for loosening soil around tree roots.
- **Astrolabe** – Employed for leveling the land.³⁵

The plow was the primary tool used for tilling and turning the soil. It was made of both wood and iron. In addition to the plow, farmers relied on tools such as al-ādah, al-ma'ūn, the large plowshare (sikkat al-faddān)³⁶, digging tools (al-manāqish), sickles (al-manājil), augers (al-barīmah)³⁷, barrels (al-barnīyāt), saws (al-manshār), pruning tools (al-mazābir), and sieves (al-qirbāl).³⁸

The large plowshare was highly recommended by Ibn al-Hajjāj because it effectively turned the soil and brought up the subsoil nutrients, which enhanced land fertility. The process of plowing and soil turning was essential for balancing soil moisture and

³⁴ Al-Abbas bin Ali Al-Rasouli, *Bughiyat Al-Fallahin fi Al-Ashjar Al-Muthmira wa Al-Riyahin*, Vol. 1, studied and edited by Khalid Khalfan bin Nasser Al-Wahaibi, Dar Al-Farqad, Damascus, 2016, pp. 119–140.

³⁵ Hamid Al-Fathi, *Agricultural Calendar in the Islamic West*, Proceedings of the National Symposium on Agriculture in the History of Morocco, Faculty of Arts and Humanities, Laboratory of Analytical Bibliography and Documentation of Maghreb Heritage, Fez, 2015, p. 44.

³⁶ Xavier Etion García Sánchez, *Previous Reference*, pp. 1379–1380.

³⁷ Mohammed Hassan, *Previous Reference*, p. 268.

³⁸ Ahmed Al-Tahiri, *Agricultural Techniques Between Preserved Scientific Heritage and Historical Studies*, from the book *Agriculture and Agricultural Techniques*, *Previous Reference*, p. 195.

temperature. When plowing, the lower, cooler, and more humid soil layer was brought to the top³⁹, while the dry and sun-exposed upper layer was buried beneath. This equalized the soil's condition, making it more fertile and suitable for cultivation.⁴⁰

Agricultural techniques in the Central Maghreb were a blend of local Moroccan farming traditions and Andalusian influences. Farmers relied on simple yet effective tools and carefully selected soil types based on their fertility and regional characteristics. This required significant effort, time, and expertise, especially in Al-Andalus, where farmers developed advanced methods for plant care, soil classification, and sustainable land use.

After plowing, the next crucial step was fertilization, primarily using manure (al-zabūl) to enhance soil productivity. The shared agricultural heritage between Al-Andalus and the Maghreb was evident, reflecting the importance of farming as the main source of wealth and livelihood in both regions.

Andalusian farmers possessed deep knowledge of horticulture, particularly in grafting techniques. They used various grafting methods, including patch grafting, scion grafting, and tube grafting, while also understanding effective plant combinations for optimal growth.⁴¹

Due to its advanced agricultural economy, Al-Andalus flourished with abundant crops, livestock, and well-maintained farming equipment. The land was cultivated extensively with plow oxen, horses, and other draft animals, demonstrating a highly organized and productive agricultural system.⁴²

This agricultural expertise led to a diverse range of crops and high yields, particularly during the Almohad period, when agricultural expansion was at its peak. The vast territories and varied climate of the Almohad Empire contributed to this prosperity. Furthermore, the rulers actively promoted farming, engaging in tree planting initiatives and even participating in harvests alongside soldiers. They also protected farmlands to ensure sustainable agriculture.⁴³

Major Agricultural Products of Al-Andalus

Al-Andalus was renowned for its highly diverse and region-specific crops:

- Olives thrived in Seville.
- Vineyards flourished in Denia and Murcia.
- Pears, pomegranates, and quinces were abundant in Valencia.
- Figs were widely cultivated in Denia and Málaga.

³⁹ Al-Farastani, *Al-Qisma wa Usul Al-Aradin* (Division and Principles of Lands), edited and critiqued by Bakir bin Mohammed Belhaj, Mohammed Saleh Al-Nasser, 2nd ed., Al-Arabiya Press, Ghardaña, 1997, p. 440.

⁴⁰ Ahmed bin Mohammed bin Hajjaj Al-Ishbili, *Al-Muqni' fi Al-Filaha* (The Convincing Book on Agriculture), edited by Salah Jarar, Jasser Abu Safiya, reviewed by Abdul Aziz Al-Douri, Publications of the Arabic Language Academy, Jordan, 1982, p. 16.

⁴¹ Ibn Al-Wahshiya, *Al-Filaha Al-Nabatiya* (Nabataean Agriculture), edited by Tawfiq Fahd, Vol. 2, French Institute for Arabic Studies, Damascus, (undated), p. 997.

⁴² Xavier Etion García Sánchez, *Previous Reference*, pp. 1380–1381.

⁴³ Ahmed Al-Maqri Al-Tilimsani, *Nafh Al-Tib fi Ghushn Al-Andalus Al-Ratib* (The Fragrant Breeze in the Fresh Branch of Al-Andalus), edited by Jean Abbas, Vol. 5, Dar Sader, Beirut, 1988, p. 77.

- Murcia was famous for its high-quality wheat.⁴⁴

According to Abd al-Wāhid al-Marrākushī, Valencia was exceptionally fertile, with a mild climate and a fragrant atmosphere, earning it the title "Muṭayyib" (the perfumed land) due to its abundance of fragrant plants and lush orchards.⁴⁵

Al-Andalus was also known for its apple, pear, and pomegranate orchards⁴⁶, as well as rice cultivation, particularly in Valencia. The region's orange groves covered 160 feddans, with each well-maintained tree (aged over 15 years) producing between 80 and 120 kilograms of fruit. Farmers used stable manure⁴⁷ as a primary fertilizer to enhance soil fertility⁴⁸.

The prosperity of Al-Andalus' agriculture was closely linked to political stability, security, and governance. When these factors were present, the region experienced economic growth, food surplus, and financial prosperity, filling the state's treasuries with wealth⁴⁹.

The main agricultural products in the Central Maghreb:

Cereal cultivation spread across the Mitidja plain⁵⁰, Ouarsenis⁵¹, Tenes⁵², Mostaganem, Oran, Tiaret⁵³, and Tlemcen.⁵⁴ Wheat and barley were widely grown in the Central

⁴⁴ Izz al-Din Omar Musa, *The Almohads in the Islamic West: Their Organizations and Systems*, Dar Al-Gharb Al-Islami, Beirut, 1991, p. 52.

⁴⁵ Hamdi Abdel Moneim Mohammed Hussein, *The Political and Civilizational History of Morocco and Al-Andalus in the Almoravid Era*, Dar Al-Ma'rifa Al-Jami'iyya, Egypt, 1997, p. 358.

⁴⁶ Abd al-Wahid al-Marrakushi, *Al-Mu'jib fi Talkhis Akhbar Al-Maghrib* (The Admirable Summary of the History of the Maghreb), Brill Printing Press, Leiden, 1881, p. 384.

⁴⁷ Ahmed bin Omar bin Anas al-Udhri, known as Al-Dala'i, *Texts on Al-Andalus from the Book "Tarsi' Al-Akhbar wa Tanwi' Al-Athar wal-Bustan fi Ghara'ib Al-Buldan wal-Masalik ila Jami' Al-Mamalik"*, edited by Abdul Aziz Al-Ahwani, Publications of the Institute of Islamic Studies, Spain, (n.d.), p. 8.

⁴⁸ Ali Islam Pasha, *Spain and Al-Andalus*, Misr Printing Press, Egypt, 1951, pp. 97–98. Abu Ishaq al-Gharnati (d. 579H), *Al-Watha'iq Al-Mukhtasara* (The Concise Documents), prepared by Mustafa Naji, Moroccan Heritage Revival Center, Rabat, 1988, p. 35.

⁴⁹ Mohammad Abdullah Anan, *The Islamic State in Al-Andalus: The Umayyad Caliphate and the Amiri State – First Era*, Part 2, 4th ed., Al-Khafaji Library, Cairo, 1997, p. 446.

⁵⁰ A city near Algiers on a large river, known for its farmlands and flax production. See Al-Humairi, p. 554.

⁵¹ A small city on a hill with an earthen wall, located on the coast, famous for wheat and barley. See: Al-Humairi, p. 88.

⁵² A city near Miliana, two miles from the sea, renowned for its beauty. Some of it is on the mountain with a surrounding wall, while the rest is on flat land, producing fruits and wheat. See: Al-Humairi, p. 138.

⁵³ A well-known port like Marsa Ata, uninhabited, with buildings made of earthen clay. Its water comes from a flowing spring, and its main crops are wheat and barley. See: Al-Bakri Abu Ubayd, *Al-Maghrib fi Dhikr Bilad Ifriqiya wal-Maghrib* (A Description of the Lands of Ifriqiya and the Maghreb), part of *Al-Masalik wa Al-Mamalik*, Islamic Book House, Cairo, (n.d.), p. 69.

Maghreb, particularly in Mitidja. Wheat was cultivated in deep and firm soil, as well as in soft and fertile land.⁵⁵

Cereals were the primary food source and the central product in the lives of the people of the Central Maghreb, given their crucial importance in terms of production and processing into flour.⁵⁶

According to Al-Idrisi, wheat and barley were widely available in the villages of the Central Maghreb. He mentioned that these grains were found in high-altitude areas and plains. He noted that in Constantine, wheat was stored in underground silos (matmoras) for up to a hundred years, with each household possessing two or three matmoras.⁵⁷

The author of *Al-Istibsar* states that the Central Maghreb had numerous cities and rural areas with extensive farmland and crops⁵⁸. This abundance of wheat and barley was due to the availability of vast agricultural lands, including Setif,⁵⁹ which produced high-quality, large-grained wheat capable of supplying Tlemcen with all its grain needs⁶⁰.

Other cereals also existed in the Central Maghreb, including millet, which was less widespread in the region. It was mainly grown in Qasr Asli⁶¹, where some lands were dedicated to cultivating millet barley.⁶²

Al-Istakhri also noted that Tiaret was a large and fertile land abundant in pastures and crops, highlighting the availability of farmland and water suitable for agriculture and plantation. Similarly,⁶³ Tlemcen was known for its healthy water sources and climate.⁶⁴

Mitidja, in particular, produced wheat in large quantities, reflecting the richness of its agricultural output.⁶⁵

⁵⁴ Ashour Bouchama, *Relations of the Hafsid State with the Countries of the Maghreb and Al-Andalus (696H–981H / 1296–1573 CE)*, Master's Thesis, Cairo University, Faculty of Arts, Department of History, 1991, p. 396.

⁵⁵ Anonymous, *Miftah Al-Raha li Ahl Al-Filaha* (The Key to Comfort for Farmers), edited by Mohammed Issa Sahibah, 1st ed., The Scientific Council for Culture and Arts, Kuwait, 1984, p. 115.

⁵⁶ Ibn Hawqal, *Surat Al-Ard* (The Picture of the Earth), 1st ed., Maktabat Al-Hayat for Publishing and Printing, Beirut, 1992, p. 77

⁵⁷ Al-Idrisi, *Marji' Sabiq* (Previously Referenced Work), pp. 83–90.

⁵⁸ Anonymous, *Al-Istibsar* (Insight), (Previously Referenced Source), p. 179.

⁵⁹ An ancient Iraqi city built by Africans on a vast plain stretching approximately twenty miles. It had high-quality wheat, but the city was ruined, leaving only the plain with its name. See: Al-Hasan Al-Wazzan (Leo Africanus), *Previously cited reference*, Vol. 2, p. 25.

⁶⁰ See Al-Wazzan, *Previously cited reference*, Vol. 2, p. 35.

⁶¹ An ancient palace built by Africans on a plain near the Anjab desert, surrounded by lands where barley and tobacco were cultivated. Once heavily populated and fortified with strong walls, it was destroyed during the war. See: Al-Hasan Al-Wazzan, *Masdar Sabiq*, Vol. 2, p. 12.

⁶² Marmol Carvajal, *Previously cited reference*, Vol. 2, p. 372.

⁶³ Al-Istakhri, *Al-Masalik wa Al-Mamalik* (Routes and Kingdoms), (n.d.), Dar Sader, Beirut, 2004, p. 35.

⁶⁴ Abu Ubayd Al-Bakri, *Kitab Al-Jughrafiya* (The Book of Geography), edited by Mohammed Hajj Sadiq, (n.d.), Maktabat Al-Thaqafa Al-Diniyya, Port Said, (n.d.), pp. 113–114.

⁶⁵ Marmol Carvajal, *Previously cited reference*, Vol. 2, p. 353

Other grains cultivated in the Central Maghreb included corn, chickpeas, lentils, and fenugreek. Additionally, wheat, barley, fava⁶⁶ beans,⁶⁷ and peas were grown, even in the Mount Metlili region⁶⁸.

In Nafusa, agriculture was one of the most significant professions practiced by the mountain inhabitants⁶⁹. Luciani mentioned a story about Abu Majid, a sheikh of Mount Nafusa (250–300 AH), who plowed his land, harvested his crops, and stored them in sacks.⁷⁰

Vegetables:

Agriculture⁷¹ and tree planting were basic subsistence professions closely tied to the environment and involved all activities related to the land⁷².

Vegetable farming was widespread in the Central Maghreb and represented a major source of income for the people. Many engaged in farming around their homes⁷³. Al-Idrisi mentioned that in the village of Banu Wazlafan, onions and cumin were cultivated⁷⁴.

Common legumes included turnips, onions, garlic, leeks, cabbage, cauliflower, chard, and other crops. Ibn Fadl added that eggplants, mallow, cucumbers, gherkins, beans, asparagus, and thyme⁷⁵ were also grown. The Maghreb region of Mjana⁷⁶ was particularly known for its saffron cultivation, as Ibn Hawqal described the area as rich in saffron, which had medicinal importance.⁷⁷

⁶⁶ Anonymous, *Miftah Al-Raha li Ahl Al-Filaha* (The Key to Comfort for Farmers), *Masdar Sabiq* (Previously Referenced Source), pp. 127–131.

⁶⁷ Abu Al-Abbas Ahmad Al-Qalqashandi, *Subh Al-A'sha fi Sina'at Al-Insha'*, Vol. 5, (n.d.), Dar Al-Tiba Al-Hayawiyya, Cairo, 1915, p. 113.

⁶⁸ This mountain is high and extremely cold but densely populated. It is located six miles from Nedroma, and its inhabitants are strong but poor. No grain grows on this mountain except barley and carob. See: Al-Hasan Al-Wazzan (Leo Africanus), *Masdar Sabiq*, Vol. 2, p. 43.

⁶⁹ Awad Al-Sharqawi, *Al-Tarikh Al-Siyasi wa Al-Hadari li Jabal Nafusa* (The Political and Cultural History of Mount Nafusa), (n.d.), Tawalt Cultural Foundation Publications, (n.p.), 2011, p. 129.

⁷⁰ Abu Al-Rabi' Suleiman bin Abdul Salam bin Hassan Al-Wusiyani, *Sirat Al-Wusiyani*, edited by Omar Bouasabana, 1st ed., Ministry of Heritage and Culture, Vol. 1, p. 2511.

⁷¹ It is noteworthy that scholars engaged in agriculture. Ibn Marzouk practiced farming, as did Ibn Al-Hajj Al-Tilimsani (d. 681 AH / 1281 AD), who settled in Tlemcen with his sons and worked in agriculture. See: Ibn Marzouk, *Al-Musnad Al-Sahih Al-Hasan fi Ma'athir Mawlai Abi Al-Hasan*, edited by Maria Jesus Peguera, National Publishing and Distribution Company, Algiers, 1981, p. 146.

⁷² Yahya bin Khaldun, *Bughyat Al-Ruwad fi Dhikr Al-Muluk min Bani Abdul-Wad*, edited by Alfred Bel, Fontana Printing Press, Algiers, 1910, Vol. 2, pp. 48–49.

⁷³ Ibn Khaldun, *Al-Muqaddima*, *Previously cited reference*, p. 130.

⁷⁴ An ancient village with vineyards on the Chelif River. See: Al-Bakri, *Masdar Sabiq*, p. 89.

⁷⁵ Al-Idrisi, *Previously cited reference*, p. 253.

⁷⁶ Ibn Nidal Abdullah, *Kitab Al-Filaha* (The Book of Agriculture), Moulay Hassan Institute, (n.d.), Tetouan, 1955, p. 78.

⁷⁷ Ibn Fadlallah Al-Umari, *Wasf Ifriqiya wa Al-Andalus* (A Description of Ifriqiya and Al-Andalus), edited by Hussein Hassani Abdul Wahab, (n.d.), Al-Nahda Printing Press, Tunis, (n.d.), p. 5.

Al-Idrisi also mentioned that M'sila had farmlands and crops, proving the widespread cultivation of vegetables in the Central Maghreb⁷⁸. He further noted that carrots were grown in N'Gaous.⁷⁹

⁸⁰Ibn Khaldun provided a summary, stating that the Central Maghreb was home to fava beans, lettuce, fennel, pumpkins, turnips, cucumbers, and gourds, among other vegetables of the time⁸¹. In Beja,⁸² chickpeas and fava beans were cultivated.⁸³

- Fruits:

The Central Maghreb was renowned for its diverse and abundant fruit production across various regions. Each area became known for specific types of fruit, with fertile lands and orchards spread throughout many parts of the region. The eastern part of Béjaïa, in particular, was surrounded by orchards.⁸⁴

Among the most widely cultivated fruits were:

- **Grapes:**

The land of the Central Maghreb was known for this fruit, which was grown in areas with abundant water. Grapevines were planted in early spring and came in several varieties, including black, striped, long, red, and yellow grapes⁸⁵. Grape cultivation was recorded in numerous regions, including Béja and Sijilmasa, where vineyards were widespread. Historians and Arab travelers described these areas as having extensive suburbs, lush gardens, and numerous orchards, with an abundance of palm trees, grapevines, and various fruits. Sijilmasa was situated between two rivers at a place called Aklef, which was supplied by numerous springs, supporting large farms irrigated by the river.⁸⁶

Grapevines and vineyards were common across many areas. The book *Al-Istibsar* highlights the widespread cultivation of grapes in various parts of the Central Maghreb, including M'sila, Mount Nafusa⁸⁷, Barshik, Cherchell, and Banu Rashid⁸⁸.

⁷⁸ Ibn Hawqal, *Previously cited reference*, p. 84.

⁷⁹ Al-Idrisi, *Previously cited reference*, p. 254.

⁸⁰ A small city in the Zab region, abundant in rivers and fruits, especially banana trees, which are transported to Beni Hammad, Bejaia, and other nearby regions. It has a marketplace and many means of livelihood. The distance to M'sila is four stages. See: Al-Himyari, *Previously cited reference*, p. 60.

⁸¹ Ibn Hawqal, *Previously cited reference*, p. 90

⁸² Ibn Khaldun, *Previously cited reference*, p. 132.

⁸³ : An ancient, beautiful, and small city with a region rich in fig trees. The inhabitants mainly engage in the fig trade. See: *Previously cited reference*, p. 251.

⁸⁴ Yaqut Al-Hamawi, *Previously cited reference*, Vol. 1, p. 314.

⁸⁵ Marmol Carvajal, *Previously cited reference*, Vol. 2, p. 377.

⁸⁶ Ibn Al-Awwam Al-Ishbili, *Previously cited reference*, pp. 366–378.

⁸⁷ Al-Hassan Tawshikht, *Al-Miyah fi Sijilmasa min Khilal Al-Masadir Al-Tarikhiyya wal-Abhath Al-Athariyya* (Water in Sijilmasa through Historical Sources and Archaeological Studies), *Majallat Kan Al-Tarikhiya* (Kan Historical Journal), Issue 44, 2019, p. 59.

⁸⁸ A tall and prominent mountain, taking about three days to cross. It has two minbars for prayers, one named Surosh, located in the middle of the mountain. The region contains flowing water, vineyards, excellent grapes, and abundant figs. The main crop is barley, which is the staple food. See: Al-Bakri, *Previously cited reference*, p. 92.

Many rural areas engaged in grape and vineyard cultivation, further proving their prevalence in the region.⁸⁹

- **Quince:**

This fruit came in two varieties: cultivated and wild. The wild variety was scarce, as it did not grow in harsh soil. During planting, some farmers used the seeds inside the fruit.⁹⁰

The author of *Al-Istibsar* described the quince of the Central Maghreb as having a pleasant taste and aroma. Similarly, Al-Idrisi noted that the region produced high-quality, large-sized quince⁹¹.

- **Walnuts and Almonds:**

Walnut trees were planted in cold, fertile land with abundant water⁹², while almond trees grew in mountainous and loose, cool soil. The cold climate contributed to the trees' growth and high yield⁹³.

The Miliana Mountains were particularly known for their walnut and almond trees, while walnuts were also found in Jijel and N'Gaous, where they were among the most abundant fruits.

- **Trees**

- **Figs:**

Fig cultivation involved taking cuttings from dried fig branches, soaking them in sheep's milk or another liquid until it curdled and changed, and then planting them⁹⁴. Dried figs were commonly sold in different regions⁹⁵, including Jijel and Béjaïa, where they were processed and traded due to their abundance⁹⁶.

- **Olives:**

There were two types of olive trees: one that grew naturally in the mountains and another that did not thrive near riverbanks. The domesticated variety produced more olives and yielded more oil than the wild type⁹⁷.

- **Mulberries:**

Mulberry trees came in different varieties, including white, black, blue, and yellow.

⁸⁹ A region extending about fifty miles from east to west and approximately twenty-five miles in width. See: Al-Hasan Al-Wazzan, *Previously cited reference*, Vol. 2, p. 26.

⁹⁰ Ibn Al-Awwam Al-Ishbili, *Previously cited reference*, p. 194.

⁹¹ Al-Bakri, *Previously cited reference*, pp. 66–76.

⁹² Anonymous, *Al-Istibsar*, *Previously cited reference*, p. 161.

⁹³ Al-Idrisi, *Previously cited reference*, p. 258.

⁹⁴ Ibn Al-Awwam Al-Ishbili, *Previously cited reference*, p. 293.

⁹⁵ Ibn Al-Awwam Al-Ishbili, *Previously cited reference*, p. 281.

⁹⁶ Marmol Carvajal, *Previously cited reference*, pp. 259–260.

⁹⁷ An ancient city dating back to the Phoenician era. During the rule of the Banu Hammad, it suffered Norman raids, forcing its inhabitants to migrate and establish a fortified city on a mountain about a mile from the coast. See: Ismail Al-Arabi, *Al-Umran wal-Nashat Al-Iqtisadi fi Al-Jaza'ir fi Asr Bani Hammad*, (*Majallat Al-Asala*), Issue 19, Matba'at Al-Bahth, Algiers, 1974, pp. 357–358.

The fruit ranged in taste from sweet to bitter. These trees grew in sandy, moist, and well-drained soil⁹⁸. White and black mulberry trees were found in vast quantities in Cherchell.⁹⁹

- **Carob Trees:**

There were two types of carob trees: a barren one that did not bear fruit and a fruiting variety that was large and grew in mountainous regions¹⁰⁰. Carob trees were widely spread in Nedroma, where the entire land was cultivated with them. The local inhabitants valued carob as a staple food, consuming it regularly and producing honey from it, which they ate throughout the year¹⁰¹.

Agricultural Policies in the Central Maghreb

Each ruling state in the Central Maghreb adopted its own agricultural policies based on its vision, available resources, and economic strategy. These policies significantly impacted the region's economic conditions, either positively or negatively.

- **The Rustamid Dynasty:**

Upon their arrival in the Central Maghreb, the Rustamids prioritized agriculture, making significant improvements to the sector. Under their rule, Tiaret's landscape transformed, as they planted trees and expanded orchards¹⁰². Tiaret's cold climate and abundant rainfall facilitated irrigation, enabling the cultivation of various fruits. The availability of water contributed to low produce prices. Olive trees and vineyards covered much of the state's territory, while its central plains were filled with cereals¹⁰³.

- **The Fatimid Dynasty:**

The economic situation changed dramatically under the Fatimids. Their arrival brought destruction, particularly due to the policies of the Shiite missionary, who relied on looting and the expulsion of large segments of the population. Agriculture suffered as a result, and fertile lands were abandoned¹⁰⁴. Those who opposed the Fatimids faced severe persecution, while those who submitted to their rule enjoyed peace and prosperity¹⁰⁵. The Fatimid rulers, particularly the successors of the Banu Ubayd dynasty, favored their allies from the Kutama tribe, granting them financial privileges and large estates, which increased their influence¹⁰⁶. However, agricultural

⁹⁸ Ibn Al-Awwam, *Previously cited reference*, p. 351.

⁹⁹ Marmol Carvajal, *Previously cited reference*, p. 372.

¹⁰⁰ Ibn Hawqal, *Previously cited reference*, pp. 78–92.

¹⁰¹ Ibn Al-Awwam, *Previously cited reference*, p. 225.

¹⁰² Ibn Al-Awwam, *Previously cited reference*, p. 225.

¹⁰³ Ibn Al-Awwam, *Previously cited reference*, p. 289.

¹⁰⁴ *Al-Mushtaq fi Ikhtiraq Al-Afaq*, Matba'at Lubdin, *Masdar Sabiq*, p. 117.

¹⁰⁵ Ibn Al-Awwam, *Previously cited reference*, pp. 246–247.

¹⁰⁶ Marmol Carvajal, *Previously cited reference*, p. 295.

conditions improved under the rule of Al-Mansur Al-Fatimi, who implemented a fair tax policy that benefited the people and stabilized the economy.¹⁰⁷

- **The Hammadid Dynasty:**

The Hammadids focused primarily on wheat and barley cultivation, which were widespread in the Central Maghreb. These crops were particularly cultivated in regions such as Constantine, Qal'at Bani Hammad, Baghaia, Tobna, Annaba, Jijel, Setif, Béjaïa, Algiers, Mitidja, and Cherchell¹⁰⁸. Additionally, they encouraged the cultivation of flax.¹⁰⁹

- **Agriculture in the Almoravid and Zayyanid Societies**

- Like other Islamic societies in the 5th century AH / 11th century CE, the Almoravid society relied heavily on agriculture as a vital economic sector. The people of the Almoravid state paid great attention to land ownership¹¹⁰, reclamation, and farming, as well as related activities such as grazing, hunting, and animal husbandry¹¹¹.

- **The Zayyanid State**

Tlemcen, the capital of the Zayyanid state, was rich in trees, particularly walnut trees. The city's beautiful location, surrounded by vast orchards, fertile fields, and abundant water sources, made it one of the most prominent cities in the Central Maghreb. Over time, it became¹¹² the capital of the Zayyanid dynasty¹¹³. The rulers built palaces, houses, gardens, and orchards, and they developed an extensive water supply network. By the year 910 AH, Tlemcen had become one of the most important urban centers in the Central Maghreb. Its strategic location, characterized by plains, hills, and numerous valleys¹¹⁴, contributed to its prosperity and economic development.

¹⁰⁷ Ibn Al-Saghir Al-Maliki (d. 3rd century AH / 9th century CE), *Akhbar Al-A'imma Al-Rustamiyyin*, Ed. Mohamed Nacer & Ibrahim Bahaz, Dar Al-Gharb Al-Islami, Beirut, 1986, p. 38.

¹⁰⁸ Abdelaziz Filali, *Buhuth fi Tarikh Al-Maghrib Al-Awsat fi Al-Asr Al-Wasit*, Dar Al-Huda, Ain M'lila, 2014, p. 38.

¹⁰⁹ Al-Darjini, *Tabaqat Al-Mashayikh bil-Maghrib*, Vol. 1, Ed. Ibrahim Talai, Matba'at Al-Ba'th, Constantine, (n.d.), p. 94.

¹¹⁰ Al-Sharif Al-Idrisi, *Al-Maghrib wa Ard Al-Sudan wa Misr wa Al-Andalus (from Nuzhat Al-Mushtaq fi Ikhtiraq Al-Afaq)*, Matba'at Lubdin, Masdar Sabiq, p. 117.

Ismat Abdul Latif Dandash, *Fi Nihayat Al-Murabitin wa Mustahal Al-Muwahhidin*, Dar Al-Gharb Al-Islami, Beirut, 1988, p. 155.

¹¹¹ Al-Qadi Al-Nu'man (d. 363 AH), *Al-Majalis wa Al-Musayarat*, Ed. Al-Habib Al-Faqi, Ibrahim Shabouh & Others, Dar Al-Muntazar, Lebanon, 1996.

¹¹² Al-Da'i Idris Imad Al-Din, *Tarikh Al-Khulafa' Al-Fatimiyyin bil-Maghrib (from Kitab 'Uyun Al-Akhbar)*, Ed. Mohammed Al-Ya'laoui, Dar Al-Gharb Al-Islami, Beirut, 1985, p. 176.

¹¹³ Rachid Bouriba, *Al-Dawla Al-Hammadiyya: Tarikhuha wa Hadaratuha*, Diwan Al-Matbou'at Al-Jami'iyya, Algeria, 1977, p. 129.

¹¹⁴ Abu Zayd Abd Al-Rahman Al-Dabbagh (605–696 AH), *Ma'alim Al-Iman fi Ma'rifat Ahl Al-Qayrawan*, Commentary by Abu Al-Fadl Abu Al-Qasim Al-Tanukhi (839 AH), Revised by Ibrahim Shabouh, Maktabat Al-Khanji, Egypt, 1968, p. 26.

- There is no doubt that the abundant agricultural production in both regions was the result of cultural exchange and interaction¹¹⁵. The geographical proximity between the Central Maghreb and Al-Andalus facilitated the transfer of agricultural knowledge and practices. Each region benefited from the other, especially after the successful Andalusian agricultural experience, which was based on scientific study of soil properties and environmental factors. Andalusian scholars devoted extensive research and writings to agriculture, helping farmers understand soil characteristics, reclamation techniques, irrigation methods, and suitable crops for different types of land.¹¹⁶
- This cultural exchange contributed significantly to the advancement of agricultural knowledge in the Central Maghreb. It is widely believed that Andalusian slaves played a crucial role in the development of agriculture¹¹⁷ in the region. However, most historical sources remain silent on this matter, with only minor references to the purchase and use of slaves for agricultural labor.¹¹⁸

¹¹⁵ Al-Bakri, *Previously cited reference*, p. 208

¹¹⁶ Abdelaziz Filali, *Previously cited reference*, p. 111

¹¹⁷ Abdurrahman Ibn Khaldun, *Al-'Ibar*, Vol. 7, p. 93.

¹¹⁸ Ibn Al-Ahmar, *Tarikh Al-Dawla Al-Ziyaniyya bi-Tlemcen*, Ed. & Rev. Hani Salama, Maktabat Al-Thaqafa Al-Diniyya, Egypt, 2001, pp. 08–10.