

Overview of Factors Affecting Agricultural Pesticide Imports in the Arab World and Libya

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ABSTRACT: This paper studies the factors influencing pesticide imports in Arab countries, with a specific focus on Libya. It examines the roles of economic performance, trade policies, environmental conditions, and government actions. The comparative analysis reveals that Libya's heavy reliance on oil revenues, coupled with political instability and weak infrastructure, disrupts import stability, hinders effective regulation, and compromises safe access for farmers. Understanding these regional and national distinctions is vital for stakeholders seeking to improve pesticide management and food security. The study recommends strengthening regulations, investing in infrastructure, and fostering regional cooperation to mitigate risks and promote sustainable agriculture. Future research should investigate the long-term environmental and agricultural impacts of these factors, particularly in conflict-affected settings like Libya.

Keywords: Pesticide, Imports, Libya, Arab countries, economic performance

الملخص: تتناول هذه الورقة البحثية العوامل المؤثرة على واردات المبيدات في الدول العربية، مع التركيز بشكل خاص على ليبيا. وتدرس دور الأداء الاقتصادي، والسياسات التجارية، والظروف البيئية، والإجراءات الحكومية. ويكشف التحليل المقارن أن اعتماد ليبيا الكبير على عائدات النفط، إلى جانب عدم الاستقرار السياسي وضعف البنية التحتية، يُخلّ باستقرار الواردات، ويعيق التنظيم الفعال، ويُعرض وصول المزارعين الآمن للخطر. ويُعدّ فهم هذه الفروقات الإقليمية والوطنية أمرًا بالغ الأهمية لأصحاب المصلحة الساعين إلى تحسين إدارة المبيدات وتعزيز الأمن الغذائي. وتوصي الدراسة بتعزيز الأنظمة، والاستثمار في البنية التحتية، وتشجيع التعاون الإقليمي للتخفيف من المخاطر ودعم الزراعة المستدامة. وينبغي أن تُركّز البحوث المستقبلية على دراسة الآثار البيئية والزراعية طويلة الأجل لهذه العوامل، لا سيما في المناطق المتضررة من النزاعات مثل ليبيا.

الكلمات المفتاحية: المبيدات الحشرية، الواردات، ليبيا، الدول العربية، الأداء الاقتصادي

I. INTRODUCTION

Agriculture is a vital sector for Arab countries, contributing to food security, rural employment, and economic diversification across many nations. However, the region faces significant agricultural challenges, including arid climates, water scarcity, soil degradation, and pests and diseases that threaten crop yields. To address these biotic threats and ensure stable food production, the region has gradually become dependent on agricultural pesticides. These pesticides are an

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essential part of modern agriculture, helping protect crops from pests and diseases and increasing productivity. Factors influencing agricultural pesticide imports vary across countries, shaped by economic, social, political, and environmental conditions. The importation of pesticides is therefore a critical element of modern agricultural systems in the Arab world as a whole and in Libya in particular. It represents a multi-billion-dollar market influenced by a complex interplay of factors, ranging from macroeconomic circumstances and government policies to environmental concerns and technological advancements. Understanding this dynamic is crucial for ensuring a safe, secure, and sustainable food supply chain. The Arab world is not a monolith; countries vary widely in their agricultural capacity, regulatory frameworks, and economic stability. For example, oil-rich countries may have different import dynamics and subsidy structures compared with less wealthy, more agrarian economies. This diversity makes district-level analysis both challenging and crucial (FAO, 2022).

Libya presents a particularly compelling case within this context. As a nation with limited arable land, less than 2% of its total area concentrated along the Mediterranean coast (FAO, 2006), its agricultural sector is extremely vulnerable to pests. Additionally, Libya's economy is heavily reliant on hydrocarbons, making its food security and agricultural inputs, including pesticides, susceptible to global oil price fluctuations and political instability. The post-2011 era, following the events of 2011, which were the revolution that happened in Libya, has been marked by a fragmentation of state institutions. This has had profound implications for the regulation, financing, and logistics of pesticide imports. Studying Libya offers a lens through which to examine the extreme effects of political and economic disruption on a critical agricultural input chain.

This study seeks to provide a holistic overview of the determinants influencing the pesticide import landscape across the Arab world, using Libya as a critical case study to highlight the challenges of a nation in transition.

The Research Problem

While the significance of pesticide imports for agricultural productivity in the Arab world is widely recognized, there is a lack of a comprehensive and systematic analysis of the multifactorial barriers that influence this trade. Current research often concentrates on individual aspects, such as regulatory frameworks or market size, without considering the complex interdependencies among economic, political, environmental, and logistical factors. This fragmented understanding impedes the ability of policymakers, agribusinesses, and international organizations to craft effective strategies for ensuring the timely access to safe and effective pesticides.

The Arab countries and Libya are facing significant challenges in the agriculture sector, particularly concerning imports of agricultural pesticides. These challenges differ due to various economic, political, environmental, and social factors. In the Arab world, these factors greatly influence the volume and quality of pesticide imports. Libya, however, encounters additional difficulties related to political and economic stability and infrastructure (Alansary. R. Elkhoully, 2023). With the

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increasing need for agricultural pesticides to protect crops and increase productivity, it becomes necessary to understand the factors influencing the imports of these pesticides. Despite the importance of this topic, there is a lack of studies that highlight the specific challenges of each Arab country, especially Libya, in this context.

Research Objectives

The study aims to:

1. Identify the key determinants of agricultural pesticide imports in the Arab world.
2. Examine the specific structural and institutional challenges affecting Libya.
3. Provide a comparative analytical framework between Libya and other Arab countries.

II. OVERVIEW OF AGRICULTURAL IMPORTS IN THE ARAB WORLD AND LIBYA

A) The Arab World

The Arab world consists of a group of countries that rely heavily on agriculture as a source of income and food. These countries differ in their needs for agricultural pesticides based on the type of crops, climatic and economic conditions.

The Arab world is a significant net importer of agricultural products due to scarce resources, increasing populations, and changing diets, with the Middle East and North Africa (MENA) and Gulf Cooperation Council (GCC) regions displaying high dependency on external food sources. The main imported commodities include cereals, meat, sugar, and oils, principally driven by resource constraints, population growth, and production deficits that fail to meet rising demands (INRA, 2015).

The Arab world imports enormous quantities of pesticides annually to cover its vast and climatically diverse agricultural areas. According to reports from the Food and Agriculture Organization (FAO) and regional organizations (FAO, 2024), countries such as Egypt, Saudi Arabia, the United Arab Emirates, and Morocco are among the largest importers of pesticides in the region. These imports play a fundamental role in protecting agricultural production, particularly in the face of climatic challenges such as water scarcity and pest infestations.

There is a growing trend towards safer pesticides, with some countries (such as the UAE and Saudi Arabia) gradually importing highly effective pesticides that are less harmful to the environment., Such as biopesticides and pesticides compatible with integrated pest management (FAO, 2024). Many countries are also updating their regulatory and pesticide registration systems to ensure their effectiveness and safety before allowing importation. Countries like the UAE and Egypt serve as regional hubs for re-exporting pesticides to neighboring countries.

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B) Libya

Libya is highly dependent on agricultural imports, importing an estimated 75-90% of its food (Park, Gandura O. Abagandura Dara, 2016) due to limited domestic production capacity, water scarcity, and insufficient arable land. The country faces a significant agricultural trade deficit, with annual imports averaging over \$2.5 billion (Youssef, Alkhurmani, Haji Alias, Siti Nurazira Binti Mohd Daud, 2017).

Libya depends almost entirely on imports of agricultural pesticides to satisfy its agricultural needs, due to the lack of a domestic pesticide manufacturing industry. Libyan pesticide imports have fluctuated significantly because of political and security instability. Before 2011, during the war in Libya, imports were more coordinated through national institutions. Afterwards, the market became more fragmented, with an increase in informal and unregulated imports.

With increasing use to combat crop pests but also significant issues regarding pesticide knowledge, application, and regulation, the pesticide situation in Libya is complex. Farmers often lack proper training on pesticide use and depend on retailers for information, which can lead to the use of unsuitable or potentially dangerous products. Some studies detect residues in crops, especially from common insecticides like cypermethrin and Imidacloprid, though at levels below EU limits (Alzarqah & Abouzkar, 2020). In the meantime, Libya faces specific pest outbreaks, such as tree-boring insects in eastern regions, which require management strategies, including the correct application of protective treatments.

III. FACTORS THAT AFFECT HOW MUCH AGRICULTURAL PESTICIDE IS BROUGHT INTO THE ARAB WORLD

Importing agricultural pesticides in the Arab world depends on economic, environmental, policy, and institutional conditions. Even though many countries in the area have similar farming problems, how much these conditions matter changes from country to country. This issue has not been sufficiently studied across the region (Arab Organization for Agricultural Development [AOAD], n.d.; UNESCWA, 2020). This part looks at what mainly causes pesticides to be imported.

A) Economic Factors

- **Economic Growth:** In 2023, the Americas bought the most pesticides, at 1.97 million tons, with Europe second. This reflects common intensive farming practices. Asia exports the most pesticides, but also uses a lot due to its large agricultural sector. Nations are increasing funding for agricultural inputs such as pesticides, which then increases their capacity to import these products (FAO, 2023).
- **Pesticide Costs:** High pesticide costs can limit access for farmers and governments, mostly in poorer countries. This can lower import amounts. For example, high pesticide costs are a big problem in many lower-income countries like Ethiopia, Bangladesh, and Nepal, and

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also in parts of Sub-Saharan Africa. Small budgets keep governments and farmers from importing enough supplies, which leaves crops open to harm and hurts farm output (Taweel & Elsobky, 2024).

- **Foreign Currency Availability:** Easy access to foreign currency is key for trade. The Middle East and North Africa (MENA) region, which has small reserves, might have trouble paying for pesticide imports quickly (UNESCWA, 2020).

B) Trade Policies

- **Trade Agreements:** Bilateral trade agreements, which occur when two countries agree to ease trade, often involve reducing tariffs. Multilateral trade agreements include three or more countries working together to simplify trade. Bilateral agreements are simpler and more focused, and multilateral agreements cover more countries and create wider cooperation. These agreements can simplify import processes, lower costs, and encourage agricultural cooperation across borders (UNESCWA, 2020).
- **Tariff Structures:** Lowering tariffs on agricultural inputs, such as pesticides, can encourage imports, making them more available to local markets (AOAD, n.d.).

C) Environmental Factors

- **Soil and Climate:** The varied soil types and climates across the Arab world have a big impact on which pesticides are needed. For example, dry countries like Saudi Arabia, Libya, and Jordan usually need pesticides that don't evaporate fast and still work when it's hot, and the soil is sandy. Areas with milder weather, like Lebanon, northern Morocco, and parts of Tunisia, use different kinds of pesticides that work better in cooler, wetter places. These climate differences decide what kinds and how many pesticides are imported. The FAO said in 2023 that the Arab region has many different climates and soil conditions, so pesticide plans must be specific to each situation to be useful for a long time.
- **Pest and Disease Prevalence:** Pest outbreaks and plant diseases often trigger urgent demand for pesticide imports, especially when local production is insufficient (AOAD, n.d.).

D) Government Support

- **Subsidies and Incentives:** Government programs that subsidize pesticide imports or provide financial support to farmers can significantly increase import volumes. Countries like Saudi Arabia, the UAE, and Qatar offer subsidies to help farmers afford pesticides. These programs lower import costs and encourage more pesticide use to boost agriculture (Gulf Cooperation Council [GCC], 2025).
- **Regulatory Frameworks:** Streamlined import regulations and robust quality control systems ensure timely access to safe and effective pesticides (Initiative 25-01, 2025).

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IV. FACTORS INFLUENCING AGRICULTURAL PESTICIDE IMPORTS IN LIBYA

Libya's pesticide import landscape is shaped by a distinct mix of economic dependency, political instability, infrastructure challenges, and environmental pressures. Although it shares some regional challenges, Libya's situation is further complicated by its reliance on oil revenues and the lingering effects of conflict. In Libya, years of conflict have left lasting damage on the agricultural sector. Irrigation systems and storage facilities have been destroyed, and many farmers have abandoned their land due to insecurity. These disruptions make it harder to import and distribute pesticides effectively. In addition, political instability and reliance on oil revenues limit the government's ability to invest in agriculture or offer consistent support to farmers. As a result, Libya's pesticide import System remains fragile and highly dependent on external conditions (FAO, 2025; Sleik, Aldaihk, & Djébali, 2024).

A) Economic Situation

Libya's economy is heavily reliant on oil exports, which generate over 90% of government revenue. This dependence makes the country vulnerable to global oil price fluctuations. When prices drop, foreign currency reserves diminish, limiting the government's ability to fund pesticide imports. This volatility disrupts agricultural planning and often leads to delays or shortages (Observatory of Economic Complexity, 2023; FAO, 2025).

B) Political and Security Conditions

Libya's fragile political environment, marked by periodic conflict and fragmented governance, has disrupted trade routes and damaged infrastructure. These conditions hinder import logistics and discourage private sector investment in agricultural supply chains, including pesticide distribution. As a result, pesticide availability is inconsistent, with increased reliance on informal markets (Sleik et al., 2024; 6Wresearch, 2025).

C) Infrastructure and Logistics

The country's import capacity depends heavily on the efficiency of its ports and transportation networks. While Tripoli and Benghazi handle most agricultural imports, outdated customs procedures, limited cold storage, and poor road connectivity delay pesticide distribution. The Sleik et al. (2024) study found that many storage sites lacked proper health and safety standards, further complicating the supply chain.

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D) Environmental Pressures

Libya's arid climate, frequent droughts, and limited arable land heighten the need for pesticides to protect stressed crops. However, environmental degradation and water scarcity raise concerns about chemical overuse. The country's regulatory framework for pesticide safety and environmental monitoring remains underdeveloped compared to regional standards (FAO, 2025; AOAD, n.d.).

Table I: SUMMARY OF FACTORS FOR ARAB WORLD (GENERAL) VS. LIBYA (SPECIFIC)

Factor Category	Arab World (General)	Libya (Specific)
Economic Factors	Economic growth, pesticide costs, and foreign currency availability	The economy depends a lot on oil money and is easily hurt when oil prices change.
Trade Policies	Trade deals and tariffs affect how easy and cheap it is to import goods.	Political instability and weak governance can disrupt trade.
Environmental Factors	Soil condition, climate variance, and pest presence.	Pesticide demand tends to rise in areas that have dry climates, droughts, or not enough water.
Government Support	Government support and rules change from place to place.	Government backing can be uneven due to political instability, alongside restricted regulatory monitoring.
Infrastructure	Logistics and port systems differ in their advancement from country to country.	Challenges in ports and logistics arise from old systems and harm from conflict.
Security and Stability	Nations with stable governments usually have reliable import activity.	Armed conflicts and political unrest are able to interrupt the supply chain between countries and in local trade.

Sources: World Bank. (2023). *Libya Economic Monitor*

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This comparison displays common and distinct issues in agricultural pesticide imports in Arab nations and Libya. The region shares economic and environmental concerns, but Libya faces extra difficulty because it relies on oil money and has unstable politics. These issues not only upset import procedures but also reduce regulatory control and government aid. Some Arab countries have steady trade deals and infrastructure, which makes imports more predictable. These differences are crucial for making informed policy recommendations and enhancing pesticide access and safety in the region.

V. CONCLUSION

This study examined various factors that influence the amount of pesticides imported into Arab countries, specifically comparing them to Libya. Macroeconomic performance factors, trade rules, nature, and what governments do affect how much is brought into the area. Libya has problems because it relies on oil money, has political trouble, and has poor infrastructure. These factors influence pesticide import volumes and make it hard to control, unsafe, and hard for farmers to use.

Knowing the differences between the area and the country is key for leaders, farm groups, and world partners who want to make pesticide use and food better. Future studies need to look at how these important habits change the environment and farms over time, mainly in war areas like Libya. Making rules stronger, fixing infrastructure, and working with nearby countries could help lower problems and make farming better in Arab nations. across the Arab world.

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