

Globalization and the Environment: A Critical Analysis Through the Algerian Lens

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Abstract:

This article aims to explore the impacts of globalization on the environment, using the Algerian case as a reference. Globalization has ambivalent repercussions on the environment. The question asked here is whether Algeria's openness to international trade is an opportunity or a threat to the environment. In light of macroeconomic indicators, the country's environmental situation has continuously deteriorated since the 1990s—a period marked by trade liberalization under the impetus of the IMF. Our empirical study concludes that this situation is explained, among other factors, by the inadequacy of the environmental public policy implemented.

Keywords: Globalization, environmental governance, Algeria, free trade, international trade

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1. INTRODUCTION

Globalization is a multidimensional phenomenon that affects, among others, various domains: economic, social, political, and environmental. However, environmental issues remain one of the most critical and debated challenges, both in developed and developing countries.

The environmental impact of globalization is difficult to define due to the complexity of the dynamics it generates. Indeed, globalization gives rise to various economic phenomena—such as intensified trade, international specialization, production outsourcing, technology transfer, and increased competition—whose effects on the environment are ambivalent. It is precisely this complex relationship, marked by multiple and sometimes contradictory interactions, that motivates our investigation into this issue.

Since the 1950s, international trade has experienced a spectacular increase. Between 1950 and 2024, the volume of world trade grew by approximately 4.500%, while its value increased by nearly 382 times compared to the 1950s (OMC, 2025). During this period, the global economy became progressively integrated, under the combined effects of three major factors (Bontems.P et Calmette M.F, 2010) advances in information and communication technologies, the reduction of tariff and non-tariff trade barriers, and the relaxation of restrictions on foreign direct investment (FDI). These developments significantly reduced transaction costs associated with trade, thus fostering the expansion of international commerce.

Paradoxically, the space of globalization is "restricted" (Senarclens.P, 2002, p. 94) . Globalization has developed unevenly from a geographical perspective. It has largely integrated the countries of the Triad — North America, the European Union, and Japan — as well as certain emerging economies (Mexico, Chile, Brazil) and industrialized nations such as China and India, not to mention a few states in Central Europe and Latin America.

In contrast, the majority of African countries remain largely on the sidelines of this process, participating only marginally in global economic exchanges and flows¹.

Initial trade liberalization efforts were initiated by industrialized nations before gradually extending to developing and transition countries. Algeria is no exception. For industrialized and emerging countries such as China, India, or Brazil, embracing free trade was a strategic decision, driven by the belief that economic openness would foster growth. In contrast, in many developing countries, trade liberalization was imposed by the International Monetary Fund (IMF) within the framework of the "Washington Consensus."²

This expansion of international trade has had considerable consequences for the environment, including accelerated depletion of natural resources, increased pollution, and the worsening of global environmental problems, often exacerbated by globalization dynamics³.

Developing and least-developed countries are particularly vulnerable to environmental challenges due to their limited resilience to ecological shocks. In these countries, economic growth and development often take precedence over environmental preservation. Environmental governance is weakened by several factors, such as rapid population growth, uncontrolled urbanization, and transformations in production and consumption patterns. Algeria is no exception to this dynamic.

The central question explored here is whether globalization is sustainable with regard to environmental protection, or more precisely, whether the various dimensions of globalization are compatible with environmental imperatives. Alter-globalization advocates see globalization and environmental concerns as fundamentally antagonistic. Conversely, proponents of free trade view globalization as an opportunity to reconcile economic openness with environmental preservation, provided that production and consumption patterns are deeply transformed through technological progress and international cooperation. This article aims to analyze the environmental challenges linked to globalization through the Algerian case.

Given Algeria's alarming environmental situation, a key question arises: to what extent does globalization, as it is currently structured, pose a threat to the environment, or could it instead contribute to its preservation? Moreover, what tools and environmental management mechanisms are available within the framework of globalization, especially for developing countries, and how effective are they in terms of scope and limitations?

To critically analyze the links between globalization and the environment in Algeria, we adopted a qualitative and analytical approach, primarily based on documentary research.

¹ Their share in international trade is relatively low. It has varied between 2 and 3% since the 1990s (WTO, 2025). This low participation is explained by several factors, including the predominance of commodity-based production and low integration into global value chains.

² The Washington Consensus made economic and financial liberalization a central pillar of structural adjustment programs and economic reforms, conditioning the financial assistance granted by the IMF to member countries.

³ Before the 1950s, the question of the impact of globalization on the environment rarely arose, as the pressures on the environment were then much less significant than they are today.

This approach draws on the review of a wide range of specialized scientific books and articles, official reports (notably those from the World Bank, the Bank of Algeria, the National Waste Agency, the Ministry of the Environment, and others), as well as national empirical studies on the subject. The objective is to cross-reference the available data in order to identify the economic and environmental dynamics at play.

The study also employs a critical analysis of concrete cases: such as the excessive use of fossil natural resources, water governance, greenhouse gas and CO₂ emissions, various forms of pollution, and waste management; to illustrate the effects of globalization on the local environment. Finally, this methodology enables an examination of the ability of Algerian public policies to reconcile globalized economic development with environmental sustainability.

Thus, based on the available empirical data, we propose a critical analysis of the thesis that globalization has positive effects on the environment, by applying it to the specific case of Algeria. However, it is essential to begin by reviewing the theoretical framework underpinning the often controversial relationship between globalization and the environment.

2. Globalization and the Environment: A Controversial Relationship

The relationship between globalization and the environment is the subject of intense debate within the fields of economics, social sciences, and environmental studies. While globalization is often perceived as a driver of growth, technological progress, and global economic integration (Mucchielli, 2008) (Krugman et Obstfeld, 2009)), its repercussions on the environment remain highly controversial. On one hand, some theoretical perspectives argue that trade openness and economic integration promote more efficient resource use and stimulate the diffusion of clean technologies, particularly through foreign direct investment (Huwart & Verdier, 2012) (Grossman & Krueger, 1995) . On the other hand, several studies warn of the negative environmental effects of globalization: pollution intensification, overexploitation of natural resources, and the externalization of environmental costs to the Global South (Daly, 1993) (Shiva, 2005).

These theoretical divergences are embedded in a longstanding debate on the sustainability of economic development (Meadows and al., 1972) (Sachs, 1997) and on the ability of market mechanisms to integrate ecological constraints. The central question becomes whether globalization acts as a lever for ecological transition or whether it exacerbates global environmental imbalances, especially in developing countries. This theoretical framework aims to explore the principal approaches that shed light on this ambivalent relationship, by contrasting the arguments of both proponents and critics of environmental globalization.

2.1. Globalization, an Old and Incomplete Process

Globalization refers to a process of growing interdependence and integration of economies on a global scale. It manifests through the intensification of flows of goods, capital, technologies, and information. This process often entails economic deregulation and a diminishing role for nation-states, in favor of supranational actors. Institutions such as the

WTO, IMF, and World Bank, along with multinational corporations (MNCs), increasingly shape the regulation of international economic relations, significantly influencing the trajectory of less developed countries (Bourachot, 2014).

Numerous studies emphasize that integration into global trade is a core recommendation of the dominant development paradigm, shaped by orthodox economic theory. However, the socio-economic and environmental costs of this openness have often been underestimated. From this perspective, globalization may be viewed as a process of “economic confinement” (Petit & Poirier, 2001, p. 10) insofar as it is primarily organized around the principle of capitalist utility, largely overlooking environmental, and to some extent, social, dimensions.

Along the same lines, globalization is governed first and foremost by economic rationality. According to the classical theory of comparative advantage developed by David Ricardo, it is justified by the mutual gains nations can achieve through trade. It is also driven by a combination of technical and political factors: reduced transportation and communication costs, technological progress, and political choices favoring the removal of trade barriers.

Globalization is not a new phenomenon; it has intensified since the 1990s. This acceleration stems from three main factors: the dynamism of commercial actors, advances in transportation and communication, and public policies promoting trade liberalization (Huwart & Verdier, 2012). Nonetheless, this process remains incomplete, as various barriers to trade persist. For political, economic, or cultural reasons, certain countries continue to protect specific sectors or products from international competition, agriculture in Europe being a notable example.

Traditionally, globalization has sparked economic controversy. Since the 1970s, following a growing environmental awareness, it has also faced criticism for its ecological impacts (Huwart & Verdier, 2012). Economically, globalization has expanded product availability through intense international competition, encouraged technological innovation, and supported economic growth. However, some contemporary economists argue that globalization is environmentally harmful (Montalieu & Géraldin, 2013).

2.2. Globalization in Service of Environmental Protection?

Globalization has faced widespread criticism on social, political, cultural, and environmental grounds. Regarding its environmental implications specifically, two major criticisms dominate. First, globalization is said to favor countries with the least stringent environmental regulations, thereby granting them a competitive advantage. This situation may lead either to the relocation of industries to those countries or to the weakening of environmental standards in developed countries seeking to remain competitive. Second, economic liberalization, by stimulating growth, tends to increase pollutant emissions and intensify pressures on the environment, rendering the current development path unsustainable in the long term.

Supporters of globalization and free trade argue that these negative effects are not consistently confirmed by empirical evidence and regard such concerns as largely driven by

alter-globalization movements. According to these proponents, the environmental impact of globalization is in fact more complex and nuanced.

From a theoretical perspective, since the influential study by Grossman and Krueger (1995) on NAFTA⁴'s environmental impact, it has become common to distinguish three main types of effects that globalization may have on the environment: scale effect, composition effect, and technique effect.

The **scale effect** refers to the environmental impact resulting from increased production. These authors implicitly suggest that trade liberalization stimulates economic growth. However, given a constant level of technology, this growth leads to greater resource extraction and higher pollutant emissions—ultimately harmful to the environment. In other words, global trade integration boosts economic activity, which can, in turn, intensify pressures on ecosystems.

The **composition effect** results from international specialization driven by global trade. According to classical trade theory developed by Ricardo, each country specializes in producing the goods it can produce at the lowest cost, while importing others. In theory, this specialization should promote a more rational use of production factors, including environmental resources, potentially benefiting the environment. However, many scholars argue that specialization does not guarantee sustainable resource management. On the contrary, abundant and low-cost resources may be overexploited. In this context, the environmental impact of specialization becomes paradoxical. Two main scenarios are identified:

1. **First scenario:** Specialization is based on traditional factor endowments. In this case, the composition effect can be positive for the environment if polluting activities are located in countries with strict environmental regulations. Conversely, it becomes negative if these activities concentrate (or relocate) in countries with weak regulatory frameworks.
2. **Second scenario:** Specialization is shaped by differences in environmental legislation. Polluting industries tend to locate in countries with the most lenient standards, thereby benefiting from a comparative advantage. This relocation has an overall negative effect on the global environment. This phenomenon is commonly associated with the concept of "pollution havens", countries where environmental regulations are lax and therefore attract the most polluting industries⁵.

⁴ NAFTA: North American Free Trade Agreement, which is a trade agreement concluded in 1994 between Canada, the United States, and Mexico with the aim of creating a free trade area. NAFTA was replaced in 2020 by the USMCA: United States–Mexico–Canada Agreement.

⁵ Some authors note that empirical data do not systematically confirm this hypothesis. For example, Grossman G-M. and Krueger A-B. (1995) showed that trade liberalization between the United States and Mexico in the 1980s and 1990s, within the framework of NAFTA, did not result in a massive relocation of polluting industries. Some empirical studies show that relocations motivated by environmental considerations did indeed take place, in specific sectors and countries. Thus, Petit M. and Poirier M. (2001) point out that, within the framework of NAFTA, many companies transferred part of their production to Mexico, taking advantage of more flexible environmental regulations. They cite in particular the case of General Motors, which was considering the closure of around twenty factories in Canada and the United States, even though the company had become the main employer in Mexico. For his part, Hugon P. (2005)

The **technique effect** helps mitigate the negative impacts of the scale effect. Trade liberalization can facilitate the transfer of more advanced and less polluting technologies to developing countries by increasing access to foreign direct investment (FDI). This mechanism enables less developed economies to adopt cleaner production methods (Grossman & Krueger, 1995). Moreover, economic openness contributes to higher income levels, which in turn can increase societal demand for environmental quality. As incomes rise, citizens typically become more environmentally conscious and demand stricter regulations (Meunier.A, 2005). This idea aligns with the Environmental Kuznets Curve, which will be discussed further below.

Grossman and Krueger (1995) conclude that the environmental impact of free trade varies depending on the context and on the relative importance of each of the three effects, scale, composition, and technique, in any given situation.

For free-trade advocates, globalization is a driver of progress, wealth creation, and economic growth. However, these dynamics are not without environmental consequences. The costs associated with globalization are often referred to as its "hidden face." Indeed, globalization may produce unintended effects such as the concentration of polluting activities in specific regions (pollution havens), environmental dumping practices, and the worsening of global ecological challenges.

2.2.1. Economic Growth, International Trade, and the Environment: What Kind of Relationship?

It is worth recalling that in their analysis, Grossman and Krueger highlighted the complex and controversial relationship between international trade, economic growth, and the environment. On one hand, in line with classical free trade theory, global commerce stimulates economic growth, which may lead to environmental degradation due to increased production (the scale effect). On the other hand, the income growth resulting from this economic expansion can foster stronger societal demand for a higher-quality environment (the technique effect). This raises a central question: Is economic growth part of the problem or part of the solution to the environmental impacts of globalization?

The answer lies in the Environmental Kuznets Curve - a key theoretical framework for understanding the relationship between economic development and environmental quality.

In their foundational 1992 empirical study on air pollutants, Grossman and Krueger established a connection between per capita income and various environmental indicators. They observed that increased production and the growth spurred by free trade contribute to rising household wealth. This, in turn, produces several positive outcomes: greater environmental awareness among citizens and businesses, enhanced financial capacity to invest in environmental protection, and broader development and adoption of cleaner production technologies.

cites the example of the tanning sector, a highly polluting activity, which has been massively relocated from Europe to southern countries, where environmental standards are less strict.

These economists argue that economic growth initially has a negative impact on the environment, up to a certain income threshold (where the scale effect predominates). Beyond that threshold, the beneficial effects begin to outweigh the negative ones (as the technique effect takes over). They thus demonstrate an inverted U-shaped relationship between a country's wealth level and its pollution levels: as income rises, pollution increases at first, then decreases once a sufficient level of development is reached. This relationship is what is known as the Environmental Kuznets Curve⁶.

This curve has been the subject of numerous interpretations and critiques over time. Several empirical studies have shown that this hypothesis holds true only for certain types of localized pollution, such as air and water pollution. By contrast, transboundary pollution issues like climate change, ozone layer depletion, and other forms of global environmental degradation show no clear turning point, thereby challenging the universal validity of the inverted U-shaped curve.

It is important to stress that the Environmental Kuznets Curve hypothesis does not imply that rising incomes will automatically lead to lower pollution. Rather, this outcome depends on the implementation of appropriate public policies. In other words, it is up to governments to respond to evolving environmental preferences expressed by their citizens. In this regard, the presence of democratic institutions is, in principle, a guarantee that government decisions will reflect public expectations in terms of environmental protection (Montalieu & Géraldin, 2013) (Fort.M, 2007)

2.2.2. The Risk of Environmental Dumping

Environmental dumping refers to a situation in which a country deliberately adopts lenient environmental regulations in order to attract foreign investment or maintain the competitiveness of its industries in international markets. This phenomenon raises increasing concerns, as it may provoke a "race to the bottom," with countries competing to lower their standards in order to avoid competitive disadvantage.

According to (Bhagwati.J, 1993) such behavior constitutes a form of trade distortion, comparable to social or fiscal dumping. Similarly, (Daly & Goodland, 1994) argue that environmental dumping undermines the principles of sustainable development, as it sacrifices responsible resource management for short-term economic interests. The concept is also linked to that of "pollution havens", where companies relocate their most polluting activities to countries with weak environmental standards This raises a fundamental question: does globalization provide a competitive advantage to countries with lax environmental regulations?

⁶ According to these authors, the environmental Kuznets curve is based on the assumption that the environment is perceived as a luxury good, that is, a good whose demand increases with income level. Thus, as populations become wealthier, they develop new expectations in terms of environmental quality. Moreover, GDP growth makes it easier to mobilize the resources needed to finance environmental policies. In other words, for both individuals and states, it becomes more feasible to forgo a portion of consumption in favor of environmental protection when incomes are higher.

Empirical studies on the subject reveal mixed results and suggest caution in assessing the true extent of the risk. While some concrete cases confirm the existence of environmental dumping, other studies indicate that environmental considerations are not always decisive in determining where multinational firms choose to locate their operations (Bontems.P et Calmette M.F, 2010).

2.2.3. Globalization and Environmental Public Goods: The Need for Governance

As previously noted, globalization is generally defined as a process of intensifying exchanges between nations. It is also characterized by growing awareness of the existence of global public goods, whose preservation or provision requires coordinated collective action among states.

Globalization has contributed to the emergence of numerous shared challenges, particularly environmental issues such as climate change, ozone layer depletion, and biodiversity loss, which gained prominence in the 1980s. At the end of the 20th century, the debate surrounding these global challenges was reinvigorated through the use of the "public good" concept, originally formulated by Paul Samuelson in the 1950s to describe goods within the national sphere. This concept has since been extended to the international level, giving rise to the now widespread notion of global public goods.

While trade liberalization was driven by the idea of comparative advantage and the efficiency of market mechanisms, the rise of the public goods concept calls for a strengthening of public action, but on a global scale. The organization of international conferences since the 1970s reflects this growing collective awareness and the inclusion of environmental concerns in the international agenda of governments. These challenges fall under the principle of common but differentiated responsibility, which acknowledges the different levels of development among countries.

(Hugon.P, 2005) emphasizes that energy consumption and greenhouse gas (GHG) emissions are central to debates on collective action, whether international or transnational. These issues, which are crucial for the future of the planet, are framed within a broader discussion about global public goods⁷.

Scientific research in this area demonstrates that globalization and environmental protection are not inherently incompatible. The main challenge lies in establishing effective regulatory structures, institutions, and mechanisms capable of governing and supporting a system as complex as globalization in a sustainable way. Preserving global public goods thus requires robust international cooperation (Hugon.P, 2005).

⁷ According to Hugon P. (2005), electricity, heating, and transportation are at the heart of consumption and CO2 emissions. The outlook is for an energy crisis. Indeed, according to the International Energy Agency, global energy demand will increase by 60% by 2030 without alternative policies. 85% of new needs will be met by fossil fuels (oil, gas, coal).

2.2.4. WTO and the Challenge of Aligning Trade and Environmental Policies

International organizations and trade- and economy-focused free trade agreements are the main drivers of intensified global exchanges.

(Petit & Poirier, 2001) underscore that the trio formed by the World Trade Organization (WTO), the World Bank (WB), and the International Monetary Fund (IMF) had just been established as an interconnected system. These three institutions play a central role in promoting globalization through trade liberalization and the reduction of both tariff and non-tariff barriers—thus facilitating the free movement of goods and capital. Moreover, as (Abbas.M, 2011) reminds us, it was during the 1980s and 1990s that the joint actions of the IMF and the World Bank became the focus of intense debate surrounding these issues.

Nonetheless, global governance coherence is not solely the responsibility of the WTO. It would be reductive to limit the question of sustainable development to commercial frameworks alone. According to (Abbas.M, 2011), the opportunity to fully integrate sustainable development goals into the multilateral trade system has largely been missed.

In conclusion to this first part, it is important to note that environmental concerns rank among the main challenges raised by globalization. The complexity of this process and its ambivalent effects on the environment have sparked a rich and ongoing debate within both scientific and political communities. The environmental impacts of globalization remain controversial. On the one hand, it can yield benefits such as economic growth, the spread of cleaner technologies, and the emergence of global environmental consciousness. On the other hand, it may lead to adverse outcomes like intensified resource exploitation, increased pollution from production and trade, the risk of environmental dumping, and the creation of “pollution havens” in countries with lax regulations.

It should also be emphasized that environmental problems did not originate with globalization; rather, globalization has amplified and diffused them through various economic and trade mechanisms. The root causes of these issues lie in the dynamics of the capitalist economic system, especially in the exclusion of social and environmental costs from traditional economic calculations. This failure to account for externalities leads to overexploitation of natural resources and an unsustainable pattern of economic growth with significant environmental consequences.

Globalization is not a natural or inevitable phenomenon : it results from deliberate political choices made by governments. As such, addressing the environmental consequences of globalization also depends on the willingness of states to cooperate at the international level. From this perspective, the central question becomes how globalization and its impact, particularly on the environment, can be effectively governed. It is therefore incumbent upon states to implement appropriate public policies capable of managing globalization while mitigating its harmful environmental effects. Developed countries began moving in this direction as early as the 1970s by establishing environmental regulations. It is thus even more urgent for developing countries to follow suit, especially as they are often more vulnerable to environmental risks due to their limited resilience capacities. What about the case of Algeria?

3. Globalization: An Opportunity or a Threat to the Environment in Algeria?

As previously stated, globalization sparks fundamental debate regarding its environmental impacts. While it is often portrayed as a development opportunity and a path to integration into the global economy, it also raises serious concerns about ecological sustainability, especially in developing countries. Algeria, rich in natural resources and progressively opening its economy since the 2000s, is not immune to this tension. Between prospects for industrial modernization and threats to fragile ecosystems, a crucial question arises: Does globalization represent an opportunity or a threat to Algeria's environment?

This question invites us to analyze the ambivalent effects of globalization on Algeria's environment, taking into account the country's economic, institutional, and ecological specificities. It involves understanding to what extent globalization can promote sustainable development or, on the contrary, intensify pressures on natural resources.

To assess the impact of globalization on Algeria's environment and related governance models, we opted for a comprehensive qualitative and analytical approach. This choice is due to the scattered and limited quantitative data on the environmental effects of free trade. Moreover, it is difficult to clearly distinguish the specific impact of globalization due to the close interconnection between national and international dynamics. Nevertheless, a causal link is widely acknowledged between globalization and major environmental issues, such as rising GHG emissions, global warming, and the overexploitation of natural, especially fossil, resources. In this context, the data used must be interpreted with caution and viewed more as indicative than as precise measurements.

As mentioned earlier, the environmental impact of globalization largely depends on the environmental policies implemented by the concerned country. Thus, before analyzing the environmental impacts of globalization in Algeria, it is necessary to first review some macroeconomic indicators that highlight the high energy intensity of the national economy, followed by a general overview of the environmental policy adopted by the Algerian state.

3.1. Key Indicators Revealing High Energy Intensity in the Algerian Economy

Algeria faces a dual vulnerability: on one hand, its economy relies almost exclusively on the export of hydrocarbons, a non-renewable natural resource; on the other hand, it heavily depends on imports to maintain economic activity. This structural fragility significantly impacts both the environment and the sustainability of development (Agharmiou-Rahmoun.N, 2020).

Although Algeria has ratified nearly all international environmental and climate conventions, environmental indicators published by the World Bank and other organizations paint a concerning picture. Few in-depth studies reveal the actual importance placed on environmental considerations in economic and social decisions since the first development strategies in the 1960s.

In this context, questioning how environmental issues are addressed in public policy becomes crucial, especially as rapid population growth and biodiversity loss increase the territory's vulnerability. Furthermore, Algerian household consumption remains heavily carbon-based, relying mostly on fossil fuels (Bouacida.R, 2016)

3.1.1. Algeria: A Fragile Economy

Algeria's economy is marked by deep structural vulnerabilities due to several interrelated factors. It is heavily dependent on hydrocarbons, which account for about 90 to 95% of its foreign exchange revenues. This mono-dependence makes the economy highly sensitive to international oil price fluctuations⁸. According to the Bank of Algeria's annual reports (2002–2024), the macroeconomic situation was healthy between 2002 and 2014, with steady growth driven by rising oil prices. The financial boom of the early 2000s enabled massive development programs, called economic recovery plans, that boosted growth. This led to increased GDP per capita (from \$11,558 in 2000 to \$54,601 in 2014) and household consumption. These variations reflect the country's economic growth during this period.

Algeria is also heavily reliant on external imports. It imports most of its consumer goods, industrial inputs, and even food products. This dependence further weakens the economy, especially during periods of declining foreign revenues. Such a situation limits the country's capacity to create sustainable jobs and to withstand external shocks.

Another key feature of Algeria's economy is its lack of diversification. Despite reform initiatives, the productive base remains undiversified. Non-hydrocarbon industries are uncompetitive, agriculture does not meet domestic food needs, and the private sector is underdeveloped. For at least two decades, Algeria's economic growth has mainly been driven by the service sector, especially construction and public works.

3.1.2. Socioeconomic Indicators Show Progress but Persistent Constraints

Economic vulnerability impacts the labor market. The country suffers from persistent unemployment⁹, especially among young graduates, and a large informal sector. This reflects a mismatch between training and labor market needs, as well as an unattractive business climate for private investment.

Demographic growth has significantly increased the number of households, whose lifestyles have also evolved due to social changes, globalization, and economic liberalization. According to the National Statistics Office (ONS), household expenditures doubled between 2000 and 2011, particularly in urban areas.

Since independence, Algeria has implemented development policies that significantly improved household consumption. Thanks to subsidies for essential goods and services, such as water, gas, healthcare, and food, a noticeable improvement in living conditions

⁸ In its annual reports from 2002 to 2024, the Bank of Algeria describes a healthy macroeconomic situation from 2002 to 2014, continuous growth in line with increases in hydrocarbon prices, but above all it is an economy very dependent on imports from abroad.

⁹ The unemployment rate in Algeria has undergone a complex and significant evolution over the years. Although the overall rate is tending to decline, certain trends persist, notably high unemployment among young people and women. It fell from 23.72% in 2003 to 12.25% in 2023.

occurred. Today, Algeria boasts nearly 100% electrification, 93% access to clean water, and about 70% connection to natural gas.

However, this widespread access to basic services comes with major environmental challenges. Electricity production, sustained by subsidized prices, relies 98% on natural gas, a non-renewable fossil fuel. Water scarcity is even more alarming: repeated droughts have increased freshwater withdrawals to meet rising demand, often at the expense of environmental standards, through wasteful water and energy use and unregulated discharges.

In short, Algeria's economy is based on a rentier model, vulnerable to external shocks and ill-equipped to meet the challenges of globalization and sustainable development. This fragility calls for real diversification and a shift toward a low-carbon, more productive, and regionally and globally integrated economy.

3.2. Overview of Algeria's Environmental Public Policy

Before the 1990s, environmental protection was not a public policy priority in Algeria. In the post-independence period, focus was placed on economic growth and development, often at the expense of the environment. This development model, neglecting ecological concerns, combined with rapid demographic growth and poorly managed urbanization, gradually led to an environmental crisis.

The 2000 Report on the State and Future of the Environment (RNE) paints a concerning picture of environmental issues in Algeria. It highlights major problems such as declining living conditions, pollution, inadequate wastewater treatment, and mismanagement of urban and industrial waste.

Faced with growing awareness and as part of its progressive adoption of international environmental and sustainable development protocols, since the 1972 Stockholm Conference, the first Earth Summit, Algeria has engaged in environmental transition since the 2000s. This transition aligns with economic reforms, aiming to place the country on a sustainable development path. This direction is increasingly necessary as globalization intensifies and imposes new demands.

In this effort, Algeria developed the National Environmental Strategy (SNE) in 2000, followed in 2002 by the National Action Plan for the Environment and Sustainable Development (PNAE-DD). These frameworks aim to structure public policy on environment and sustainability. Achieving their goals depends on several levers: strengthening environmental institutions, adapting the legal framework through innovative economic instruments, mobilizing appropriate financial resources, and implementing sector-specific action programs.

3.3. Globalization: What Role for Algeria?

Due to its outward-oriented nature, Algeria's economy has been part of international trade since independence. However, it presents a paradox: while highly involved in globalization through trade and import of resources, Algeria remains largely excluded from processes such as upgrading, partnerships, and investments.

As a reminder, Algeria's economy heavily depends on foreign trade, which decisively influences key economic indicators, including internal balances. It also reveals a passive type of integration, vulnerable to global market fluctuations. Moreover, non-hydrocarbon exports remain marginal, only about 3% of total exports on average, highlighting structural vulnerabilities.

In its effort to actively integrate into globalization, Algeria has faced two major milestones: its WTO accession project and the Association Agreement with the EU, signed in 2002 and enforced in 2005. These commitments are incompatible with passive integration. They require deep transformations of the country's socio-economic environment to meet international standards, particularly WTO norms¹⁰.

Algeria struggles to attract foreign direct investment (FDI), especially in high value-added non-hydrocarbon sectors. Several structural barriers explain this: lack of coherence and visibility in economic policy; legal instability; inadequate training systems; underdeveloped service sector; limited domestic market, etc. (Kerdoun, 2001)

In the absence of detailed statistics, the exact composition of Algeria's FDI stock remains unclear. However, it is likely that a large share is concentrated in the hydrocarbon sector.

FDI dominance in hydrocarbons originates from a 1971 decision to open this industry to foreign capital. Investments mainly targeted refining, exploration, and production of oil and gas. The sector's attractiveness grew after the oil shocks of the 1970s and 1980s. However, before 1992, Algeria did not allow foreign companies to produce independently. They could only operate through production-sharing or service contracts with the national hydrocarbons company.

This trend is unlikely to reverse in the short term, as the global energy market remains demand-driven and will likely stay that way for a long time. Despite efforts by major consumer countries to diversify energy sources, fossil fuels still dominate energy balances. In this context, rising global demand continues to stimulate supply, driven by major consumer powers like the U.S. (Benyouczf, 2008).

Clearly, under current conditions, Algeria's integration into globalization may become even more complex, economically and environmentally, given its already critical situation.

3.4. Globalization and National Activities: What Impact on the Environment?

As mentioned in the introduction to this section, due to the interlinking of national and international dynamics, it seems difficult to present only the environmental impacts of

¹⁰ This involves, in particular within the framework of the association agreement with the European Union, the adoption of European technical regulations, the establishment of a quality management system in accordance with the requirements of the target market, the harmonization of the national legal framework with international standards, as well as the commitment to remove any discriminatory rule likely to distort competition or constitute an obstacle to free trade.

globalization. Therefore, we will proceed with a global approach. Without claiming to be exhaustive, we will examine a few indicators.

The following indicators highlight the highly energy-intensive nature of the Algerian economy, which contradicts the country's international commitments. This situation further weakens national economic prospects while negatively impacting the environment (Dorbane.N, 2023). The opening of the national economy to foreign trade, encouraged notably by the IMF, has worsened an already concerning environmental situation. The data are primarily drawn from the World Bank website and several reports from the Ministry of the Environment.

According to annual World Bank reports, between 2002 and 2022, Algeria's GHG¹¹ emissions increased by 61%, from 175.47 million tonnes (Mt) to 281.97 Mt. In 2023, total CO₂ emissions were 180.36 Mt, a 3.37% decrease compared to 2022. The most polluting sectors are energy (71%), industry (21%), and waste (7%). The growth rate of CO₂ emissions is thus nearly double that of population growth. These figures point to a clear overconsumption of energy, reflecting the highly energy-intensive nature of consumption in Algeria, especially due to the low energy efficiency of household equipment.

Similarly, in 2014, CO₂ emissions from the consumption of liquid fuels in Algeria were 12 times higher than in 1960, compared to a 3.86-fold increase globally. This contrast shows Algeria's strong reliance on fossil fuels, its main natural resource. The evolution of primary energy consumption reflects a significant increase in energy use in Algeria, due to both changing consumption patterns and the energy-intensive nature of imported household appliances. Between 1971 and 2014, this consumption increased 5.69 times in Algeria, compared to just 1.43 globally (Agharmiou-Rahmoun.N, 2020).

Again, according to World Bank annual reports, fossil fuel consumption in Algeria shows a strong dependency and a clear divergence from global trends. While fossil fuel use continues to rise in Algeria, the rest of the world is gradually shifting toward renewable energy. Moreover, between 1971 and 2014, Algeria's energy consumption was almost entirely reliant on fossil fuels. Paradoxically, Algeria's consumption of renewable energy is very low compared to its Maghreb neighbors, Morocco and Tunisia. Not only is the share of renewables in the national energy mix nearly nonexistent, but it has also been declining since the early 2000s, not even reaching 0.5%.

It is important to stress that Algeria is significantly affected by air pollution, with notable impacts on public health. The vehicle fleet, exceeding 8 million vehicles, is 60% diesel-powered, contributing significantly to air quality degradation. Fine particle (PM10) concentrations regularly exceed the World Health Organization's standards, with daily averages ranging between 43 and 53 µg/m³, reaching up to 64 µg/m³ during the winter. It is estimated that about 2,500 annual deaths are linked to this pollution, mostly in urban areas.

¹¹It is generally recognized that the consumption of fossil fuels, particularly hydrocarbons, is one of the main factors in CO₂ emissions and global warming, a phenomenon that has accelerated since the 1980s (Hugon P., 2005). In addition, sectors such as electricity production, heating and transport contribute significantly to overall energy consumption and the resulting CO₂ emissions.

Additionally, land degradation and biodiversity loss are serious concerns. Over 2.5 million hectares are exposed to desertification and soil salinization. Furthermore, erosion affects more than 12 million hectares of agricultural land and watersheds, compromising productivity. Forest ecosystems cover only 4.3 million hectares, a large portion of which is in an advanced state of degradation.

Although Algeria is a producer and exporter of oil, it paradoxically ranks among the largest importers of plastic materials in various forms, as well as related technologies, particularly those used in packaging. According to World Bank data, since 2017, Algeria has been the second-largest importer of primary-form plastic materials in Africa. It also ranks first on the African continent in the import of plastic packaging technologies, ahead of South Africa and Nigeria, and second in the Middle East and Africa region.

According to the same source, more than half of the imported plastic materials are intended for the packaging industry. This trend has led, downstream, to a significant increase in plastic waste production. According to the National Waste Agency, plastic waste accounted for approximately 16% of household and similar waste generated in 2022 (as reported by Dorbane N., 2023), making plastics the second largest component after organic waste. However, their management remains a major environmental challenge in Algeria.

In the same vein, urban waste management also represents a major challenge in Algeria. In 2022, household waste production was estimated at about 13.5 million tonnes, with an annual growth rate of 3%. The collection rate is nearly 85% in urban areas, but only 45% in rural zones, which make up most of the national territory. Waste recovery remains very low, below 10%, while technical landfill use did not exceed 45% that same year (Dorbane.N, 2023).

At the end of this second section, it is important to note that in Algeria, as in many developing countries, economic and environmental reforms have been implemented in a context marked in particular by weak and non-restrictive environmental regulation. This raises a fundamental question: under such conditions, is sustainable development truly achievable? In view of the country's critical economic and environmental situation, the answer appears to be negative. Since the 2000s, the effects of climate change, among other environmental challenges, have been exacerbated by the combined influence of population growth, poorly managed urbanization, accelerated industrialization, and the pressures of globalization.

Algeria appears particularly vulnerable to environmental issues due to its low resilience capacity and the long-standing priority given to short-term economic growth, often at the expense of environmental protection. However, starting in the 2000s, a shift in political discourse began to take shape, marked by an expressed willingness to promote the principles of sustainable development.

Algeria undertook its opening to foreign trade under pressure from the IMF, in a context characterized by fragile economic structures weakened by the effects of structural adjustment programs. This situation raises a central question: does this opening represent an opportunity or a threat to the environment? In reality, the liberalization of foreign trade under such conditions has already had significant negative repercussions on the

environment. Furthermore, accurately assessing the environmental impacts of globalization remains difficult, due to the close interconnection between internal economic dynamics and activities related to international trade.

4. Conclusion

This contribution has provided an analysis of the environmental impacts of globalization through the lens of the Algerian case. As a central issue in political, economic, and social debates, globalization has also emerged as a major environmental concern since the 1970s.

Globalization has a significant impact on the environment. While it brings many challenges, such as various forms of pollution, the overexploitation of natural resources, global environmental issues like climate change, environmental dumping risks, and the emergence of “pollution havens”, it also offers opportunities. It can promote the spread of innovative green solutions and strengthen international cooperation for long-term environmental protection. To mitigate its negative effects, it is crucial to implement more sustainable global policies, harmonize environmental standards at the international level, and promote more responsible trade practices.

The debate on environmental governance, both nationally and internationally, is more essential than ever given the crisis facing environmental public policies and global regulatory mechanisms. This crisis manifests in various forms, including the depletion of natural resources, climate change, rising greenhouse gas emissions, and other threats that could seriously jeopardize humanity’s future.

Globalization is, by definition, a worldwide phenomenon. However, developing countries like Algeria remain on the margins of this process. Their main challenge lies in finding a balance between the need to continue economic development and the imperative to manage environmental risks that threaten the entire planet in the 21st century.

The analysis of the interactions between globalization and the environment in the Algerian context reveals a complex and ambivalent reality. On one hand, globalization has promoted economic openness, access to technology, and Algeria's participation in major global environmental discussions. On the other hand, it has also intensified the overexploitation of resources, shifts in consumption patterns, urban and industrial pollution, uncontrolled urbanization, the weakening of ecosystems, and more.

Algeria has indeed joined several international environmental commitments and has also strengthened its environmental regulatory and institutional framework; however, implementation on the ground often remains insufficient due to the country’s dependence on hydrocarbons, ineffective environmental governance, and a civil society that remains largely marginalized in the decision-making process.

Said differently, globalization represents both an opportunity and a threat to the environment in Algeria. On one hand, it can intensify environmental pressures through rapid industrialization, intensive resource exploitation, weak ecological standards, and changing consumption patterns. On the other hand, it also provides the opportunity to benefit from clean technology transfers, strengthen international cooperation, and adopt sustainable

practices that have proven effective elsewhere. For globalization to become a positive lever, Algeria must implement an adequate and ambitious environmental public policy, strengthen its ecological governance, and fully engage in global dynamics of ecological transition and sustainable development. Building a sustainable and environmentally responsible economy undoubtedly requires the genuine involvement of all stakeholders.

Despite the valuable contribution of documentary research, this methodology presents certain limitations. First, access to recent and reliable data in Algeria—particularly in the environmental field—is sometimes limited or fragmented, which can affect the accuracy of the analysis. Furthermore, the absence of field surveys or direct interviews with institutional, industrial, or civil society actors limits the depth of the qualitative approach and the diversity of perspectives.

In addition, the selected case studies cannot be generalized to the entire Algerian territory, given the regional disparities in development and environmental management. Finally, the complexity of the interactions between globalization, public policies, and local realities requires an interdisciplinary approach that documentary analysis alone cannot fully provide. These limitations suggest that this study should be seen as a foundation for reflection, paving the way for more in-depth research that incorporates mixed methods (both quantitative and qualitative).

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