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The State Responsibility Developments for Climate Change Damage: A Comparative Study

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Abstract

The phenomenon of climate change is one of the most important issues discussed on the international and national scene as it represents a challenge facing humanity. Legal interest in the phenomenon of climate change began at the level of international organization in 1992 through the United Nations Framework Convention on Climate Change, then legal interest took the direction of obligation through the advanced judiciary of national courts in some countries and the rulings issued by them that gave this contemporary law the characteristic of obligation. The number of lawsuits related to the state's responsibility for climate change damages has also increased, as these lawsuits exceed 3400 cases according to statistics from the Sabin Center for Climate Change Law.These lawsuits raise several legal problems that require the application of legal thought to determine the pillars of the state's administrative responsibility for climate change damages, the effects of this responsibility, and its specificity that imposes on the administrative judge to follow a developed approach to overcome them. Therefore, this study will focus on these problems to contribute to developing a sound concept of the state's administrative responsibility for climate change damages.

Keywords: *Sustainable Development, Climate Change, State Responsibility for Climate Change, Causal Relationship, Compensation for Climate Change Damages.*

Introduction

Legal interest in the phenomenon of climate change at the level of international organization began in 1992 through the United Nations Framework Convention on Climate Change, then legal interest took a mandatory approach through the advanced judiciary of national courts in some countries and the rulings issued by them that gave this contemporary law the character of obligation. Also, since 2015, an increase in what is called climate litigation or climate justice has been observed, as a result of the increase in the number of disputes presented to judges, through which plaintiffs demand greater climate responsibilities from public authorities and companies, based on requests that often aim to shed light on the negligence of actors in combating climate change, or to hold the state responsible for not fulfilling its duty of caring for the climate towards citizens. Therefore, lawsuits for state liability for climate change damages have attracted the attention of legal jurisprudence because of the details they raise that require research to reach an intended goal represented in developing a sound conception of the state's administrative liability for climate change damages.

Research Problem

The research problem is limited to considering the seriousness of the damages of the climate change phenomenon in determining the conditions for the state's liability for the damages of this phenomenon, which is surrounded by scientific difficulties, and requires extensive knowledge from the judge to be able to determine the environmental duty that the state must take, in addition to deciding whether there is an error, or whether the matter does not entail the state's liability, as well as the difficulty of proving the causal relationship and attributing environmental changes to greenhouse gas emissions and establishing a triple link between the pillars of climate liability, the mechanisms for compensating for these damages, and the effectiveness of non-traditional means in achieving its goals.

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Research Objectives

This research aims to achieve several essential goals that demonstrate its importance, including defining the meaning of the phenomenon of climate change, shedding light on the legal system of the phenomenon of climate change, also defining the basis of the state's responsibility for climate change damages, then clarifying the pillars of the state's responsibility for climate change damages, and finally illuminating the specificity of the effects of the state's responsibility for climate change damages.

Research Methodology

Given the nature of this study and what it requires in terms of an integrated scientific approach, it requires a careful induction of the rulings of the French and Anglo-American judiciary, and deduction from among the rules and rulings that help clarify the ambiguity of the research problem, so the comparative approach will be the mainstay of this research, using induction and deduction.

Research Division

Considering the above, the research plan is divided as follows:

Introductory Section

The nature of climate justice and the objective foundations of climate lawsuits.

Section One

The pillars of responsibility arising from climate change and the administrative judge's approach to overcoming its legal difficulties.

Section Two: The specificity of the effects arising from climate responsibility.

Conclusion

Results and recommendations.

Introductory Section

The Nature of Climate Justice and the Objective Foundations of Climate Lawsuits

The study of state responsibility for climate change damages requires addressing the concept of climate change and the sources of international and national climate law, as follows:

First Requirement

The Concept of Climate Law and Climate Justice

The United Nations Framework Convention on Climate Change defined climate change as: "A change in climate due directly or indirectly to human activity that leads to a change in the composition of the global atmosphere in addition to the natural variability of climate over similar periods" (1).

Thus, climate change includes the transformations that occur in the environment because of human activity in a way that affects the Earth's atmosphere, causing an increasing rise in temperatures, rainfall, and other changes that are measured over long periods. In this sense, it differs from global warming, the meaning of which is limited to an increase in the average temperature near the Earth's surface (2).

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Legal interest in this phenomenon began at the level of international organization in 1992 through the United Nations Framework Convention on Climate Change. Then, legal interest took a binding approach through the advanced judiciary of national courts in some countries and the rulings that gave this contemporary law the character of binding (3), as well as serious efforts for international litigation regarding climate change (4). Then, the national legislator began to intervene with binding rules to combat the phenomenon of climate change. Legal jurisprudence did not stand by as a spectator, but rather the call to introduce new ideas to confront climate risks became a global legal call that went beyond the limits of traditional divisions and sub-barriers of public law and private law in favor of what can be called sectoral division (5); such as the energy sector, the real estate sector, the transportation sector, and of course climate law.

Since 2015, there has been an increase in so-called climate litigation or climate justice, as a result of the increase in the number of disputes brought before judges in which plaintiffs demand greater climate responsibilities from public authorities and companies, based on requests that are often aimed at highlighting the inaction of actors about the fight against climate change or holding the state responsible for not fulfilling its duty of climate care towards citizens, and some of them aim to ensure that private actors (companies and financial institutions) change their internal policies to adapt their activities and impacts to the fight against climate change

Climate litigation can therefore be defined as "any federal, state, tribal, or local administrative or judicial dispute in which filings of documents or court decisions directly and expressly raise a question of fact or law regarding the substance or policy of the causes and effects of climate change." (7), and these claims are objectively based on international and national sources of climate law as well as general legal principles. However, relying on these sources in climate litigation raises several legal difficulties that we will address after presenting the objective foundations of climate litigation through the following claims.

The Second Requirement

Objective Foundations of Climate Lawsuits

These lawsuits are objectively based on the sources of climate law and can be limited to international sources represented by international and continental agreements such as The United Nations Framework Convention on Climate Change (UNFCCC), which was approved in 1992 and entered into force in 1994. This agreement is considered one of the leading international agreements as it provided the legal basis for international negotiations aimed at preserving the climate and caring for the interests of present and future generations. Also, the **Kyoto Protocol** is one of the historical agreements emanating from the United Nations Framework Convention on Climate Change. The protocol entered into force in 2005. **The Paris Climate Agreement:** This agreement came as an extension of confronting climate change and its negative effects. At the 21st Conference of the Parties held in Paris on December 12, 2015, 197 countries adopted the agreement to reduce greenhouse gases and work to mitigate the increase in global temperature in this century to two degrees Celsius while seeking to limit the increase to 1.5 degrees. This agreement entered It entered into force on November 4, 2016, and has been joined by 194 countries. The agreement includes a commitment by countries to work together to mitigate the effects of climate change and a mechanism to assist developing countries in their efforts to mitigate and adapt to climate change. The sources of national climate law are the set of legislation and internal measures taken by countries to combat the phenomenon of climate change, whether this legislation is constitutional, legal, regulatory, or merely voluntary initiatives that fall within the framework of soft law rules.

At the level of comparative national constitutions, the Italian Constitution of 1947 is considered the first in the world to enshrine provisions specific to the environment and the protection of natural landmarks. As for combating climate change, nine constitutions have included special provisions for it, such as the constitutions of Bolivia, the Dominican Republic, Tunisia, Ecuador, Venezuela, Vietnam, Nepal, Côte d'Ivoire, and Thailand

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At the level of comparative national legislation, there is France Law No. 922 issued on August 17, 2015, regarding the energy transition to green development, which set a 40% reduction rate in greenhouse gases by 2023 (9), as well as the Energy and Climate Law issued in 2019, which imposed an obligation on new shopping centers, warehouses, and other facilities to establish a renewable energy system on an area of no less than 30% of the project area (10).

In the United States, the US Senate approved a bill to allocate $369 billion to combat climate change. At the state level, the California Global Warming Act was passed in 2006, as well as in Massachusetts, Washington, and New Jersey, which was passed in 2020, and the New York State Act in March 2023, which is considered one of the strongest environmental justice laws and includes the adoption of state-level greenhouse gas emission limits of 40% by 2030 and 85% by 2050 (11).

At the African level, we find that some African countries include legal provisions related to climate change within the framework of various environmental legislative laws (12), and others have laws related to climate change directly. These countries are Benin (2018), Kenya (2016), Mauritius (2020), Uganda (2021), and Nigeria (2021) (13). As for the Kingdom of Saudi Arabia and Egypt, if there is no local legislation to combat climate change, as previously mentioned regarding France, the United States, and the United Kingdom, it is possible to infer aspects of interest in climate change at the legislative level through the texts of the constitution, environmental legislation and regulations, and voluntary initiatives to combat climate change, which fall within the framework of soft law rules.

Section One

The Elements of Liability Arising from Climate Change and the Administrative Judge's Approach to Overcoming Its Legal Difficulties

Climate justice poses a challenge to the administrative judge specifically in the field of liability for climate damage, as it poses a legal dilemma given that polluters often fall outside national borders and it is difficult to determine the state's liability for the element of fault, let alone determine it.

These causal problems have practical consequences, as most defendants argue that it is difficult to establish causal links, which would prevent determining that they are responsible for climate change damage. The following difficulties related to the elements of climate liability and the administrative judge's approach to dealing with them will be discussed as follows:

The First Requirement

The Error That Creates the State's Responsibility for Climate Change

Error represents the fundamental element in the establishment of responsibility for climate change; as the idea of error in climate liability lawsuits against the state raises minutes of legal thought; this is evident from judicial applications that confirm the adoption of a broad concept of error by the administrative judge; as the determination of error is not limited to merely violating legality, but includes material actions and even non-intervention, which represents a tangible phenomenon in climate liability lawsuits to determine the element of error in these lawsuits (14).

The Administrative Court in Paris ordered, for the first time in the history of France, the state to compensate children who were suffering from respiratory diseases, and these diseases were linked to air pollution. In this case, the plaintiffs relied on the fact that the state's failure to combat air pollution constitutes an error of the type that makes it directly responsible for the damages inflicted on the children and that the measures adopted by the state did not ensure that the periods of exceeding the limit values of the concentration of pollutants in the atmosphere in the Ile-de-France region were as short as possible (15).

The court found fault, although the expert report indicated that air pollution cannot be considered the sole cause of bronchiolitis in children. The respiratory syncytial virus (RSV) has been identified as responsible

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for 60 to 80% of bronchiolitis attacks. Other factors may also contribute to the occurrence of these symptoms, such as allergies, parental smoking, exposure to household chemicals, or weather conditions. Perhaps this intertwining of public - or even private - actions of individuals and natural conditions that contributed to the aggravation of the damage represents, as some jurisprudence sees it (16), an obstacle to knowing the effect of each in causing the damage. It is noted in the previous case that the state's fault is represented by the state's failure to intervene, and this is a negative fault, despite the differences like claims related to air pollution from climate disputes (17);

However, it can be compared to the approach of the administrative judiciary concerning climate issues and the audacity of the administrative judge in emphasizing the state's commitment to respecting its obligations related to reducing greenhouse gas emissions and emphasizing the existence of environmental damage linked to climate change. This connection is achieved even at the international level, as the International Tribunal for the Law of the Sea has recognized that anthropogenic greenhouse gas emissions into the atmosphere constitute "pollution of the marine environment" within the meaning of Article 1, paragraph 1, subparagraph 4 of the United Nations Convention on the Law of the Sea (18).

In reaching this decision, the Court noted that the definition of "marine pollution" contained in the United Nations Convention on the Law of the Sea is consistent with the damage caused by anthropogenic greenhouse gas emissions "through the introduction of carbon dioxide and heat (energy) into the marine environment, anthropogenic greenhouse gas emissions cause downstream climate change and ocean acidification, leading to the harmful effects described in the definition of pollution of the marine environment" (para. 178).

It can be said that the expansion in defining the concept of the fault element is because the responsibility for climate protection is no longer limited to the state alone, but has become the responsibility of the administrative judge who bases these solutions on judicial precedents, whether at the level of determining the state's responsibility in general, as is the case in the field of medical liability (19), or about climate lawsuits in particular. The most prominent example of this is the ruling of the Council of State in the Grand Synthe case (20). On July 1, 2021, in a case filed by the municipality of Grand Synthe and several environmental organizations, the Council of State ordered the French government to take all necessary measures before March 31, 2022, to achieve the goal of reducing greenhouse gas emissions by 40% by 2030, compared to 1990 levels, to comply with the Paris Agreement and the European commitments undertaken by the French legislature.

After nearly two years, the Council of State found that its decision had not been implemented, and in its ruling issued on 10/5/2023, it decided first to refuse to impose a fine of 50 million euros on the state for each six-month period of non-compliance that the plaintiffs had requested based on the Council's conduct in its judicial precedents related to air pollution lawsuits (21); the Council justified its refusal to impose the fine by the French government's conduct and the steps it had already taken and those it was likely to take to reduce greenhouse gas emissions, which is not consistent with imposing a fine at this stage, and the Council chose to regularly supervise the implementation of its ruling;

These precedents have established the administrative judiciary's approach to dealing with climate claims. In the case of the 23rd century (23), the Paris Administrative Court decided on October 14, 2021, that "the state is responsible for environmental damages to the extent of the obligations it did not respect within the framework of the first carbon budget." In this case, the error is represented by the state's failure to fulfill its duties in combating climate change. It is noted that the developments in the case have not ended yet, as the Paris Administrative Court rejected on December 22, 2023, the request to oblige the state to pay compensation for the environmental damage, which was issued in the ruling of October 14, 2021 (24).

Even at the European level, we sense an expansion in defining the concept of error in climate claims, and not limiting it to carrying out an illegal legal act, i.e. positive error, but rather extending to the form of negative error represented by refraining from intervening or neglecting to do so (25); Meaning that the authorities have intervened but in an insufficient manner, i.e. partial negligence (26), and here the judge imposes on the state an obligation of means and not an obligation of result.

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The Council of State decided that the state had violated its obligations to achieve results in line with the objectives set by the European Directive on air quality, concluding that the state had been wronged based on its failure to achieve results that improved air quality [27]. The European Court of Human Rights also concluded in the KlimaSeniorinnen case that Switzerland had violated the text of Article 8 of the Convention due to the inadequacy of its legislative policies related to climate [28]. Emphasizing the responsibility of individual states to combat climate change, the court said: "Climate change is undoubtedly a global phenomenon that deserves to be addressed by all states at the international level. The global climate regime established by the United Nations Framework Convention on Climate Change is based on the principle of common but differentiated responsibilities and the respective capabilities of the states concerned. This principle was reaffirmed in the Paris Agreement (Article 2, paragraph 2) and addressed in the Glasgow Climate Pact (paragraph 18), as well as in the Sharm el-Sheikh Implementation Plan (paragraph 12). It follows that each state bears its share of responsibility for taking the necessary measures to address climate change and that the adoption of these measures is determined based on the specific capabilities of the state concerned, and not on a specific action (or omission) by any other state.

The Court considers that the defendant state may not evade its responsibility by emphasizing the responsibility of other states, whether they are contracting parties to the Convention."

It is clear from the above that forming and proving the element of error in climate lawsuits is not an easy matter, but through judicial precedents, the judge's approach to finding the element of error can be explored through the state's behavior, as it is not required to completely refrain from intervening to form the element of error, but merely delaying, neglecting, or the inappropriateness of means and measures all constitute neglect that constitutes the element of error.

The other, more accurate matter in proving the element of error is the judge's dealing with scientific knowledge, as climate science is a modern science surrounded by scientific difficulties that require extensive knowledge from the judge so that he can determine the environmental duty that the state must take in light of the scientific data and databases provided by those concerned with this cosmic phenomenon, in addition to deciding whether there is an error, or whether the matter does not entail the state's responsibility in light of the scientific evidence that represents a special element for thinking and making a judicial decision in such lawsuits.

The Second Requirement

The Element of Harm in Climate Liability Claims

It is accepted in liability systems of all kinds that there is no liability without harm or a real threat of it occurring. Harm in claims related to climate change is distinguished by its special nature, as the damages arising from climate change may be harms that affect individuals in themselves or their property or that affect the environment itself, whether they occurred or will occur in the future, which is the most common in climate claims. Environmental damage was first recognized in France after the sinking of the oil tanker Erika in 1999 off the coast of Brittany. This disaster caused significant pollution on the Atlantic coast. The Court of Cassation defined environmental damage in the wake of this case as: "direct or indirect damage to the environment that affects a legitimate collective interest" [29]. The French legislator then enshrined the concept of environmental damage in civil law by the Law of August 8, 2016, on the Restoration of Biodiversity and Nature. The administrative judge expanded the scope of application of the provisions included in the Civil Code relating to environmental damage to the administrative liability system, and every person with an interest in litigation can file a claim for compensation for environmental damage [30]. The administrative judge has recognized the existence of environmental damage in disputes related to air pollution, for example, the ruling of the Administrative Court in Montreuil that exceeding the limit values cannot constitute a serious failure of the State to combat atmospheric pollution within the meaning of environmental law,

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the inadequacy of the measures taken to address it, on the other hand, constitutes a shortcoming of this kind, but the court did not decide on the plaintiff's right to compensation because of the absence of a causal relationship (31).

In a more sophisticated case, the Administrative Court of Paris ruled in its ruling of 16 June 2023 that the State was responsible for the respiratory diseases suffered by the plaintiffs' minor daughters - since their birth - due to air pollution, in particular the exceeding of the maximum concentration limits of pollutants in Île-de-France between March 2015 and February 2017. The judge of the Administrative Court of Paris concluded that the suffering suffered by the affected children, both physical and moral, must be assessed fairly; he therefore ordered the State to compensate the victims (32).

In the same context, the European Court of Human Rights took a similar position in Pavlov and Others v. Russia, where it decided that living in an area where air pollution exceeds the applicable standards exposes the applicants to increased risks to their health and their rights to respect for their private life (33). The judgment in KlimaSeniorinnen shows that the Court frees itself from the environmental protection that characterized its previous case law, by granting special protection to the climate, as according to the Court it is "neither sufficient nor appropriate" to follow its environmental jurisprudence (34).

These rulings have been reflected in the administrative judge's handling of climate claims; the boldness of the administrative judge was most clearly demonstrated in the case of the century, where the Administrative Court of Paris, in its judgment of 3 February 2021, recognized the existence of environmental damage linked to climate change (35), in particular in the application of articles 1246 et seq. of the Civil Code, and considered that the partial failure of the French State to achieve its objectives of reducing greenhouse gas emissions makes it liable for climate change damages.

It is clear from case law that damage in climate lawsuits may take many forms, some of which are related to the environment itself (36); such as coastal erosion due to rising temperatures, melting ice, or desertification, and some of which are related to people, such as attacks on property, health, basic freedoms or physical safety, whether these damages occurred or will occur in the future (37).

Damage is not limited to material damages, but may extend to moral damages, for example, the ruling of the Paris Administrative Court issued in the case of the Sea Sheperd France Association. The court confirmed that the error committed by the state was due to the delay in respecting its European and national obligations in matters of protecting and monitoring marine mammals; as fishing activities have harmed the collective interests defended by this association to defend the oceans and marine mammals, and have caused them confirmed, direct and personal moral damage, for which they are entitled to claim compensation during the period from 2014 to 2019. Under these conditions, the court ruled to make a fair assessment of this damage by awarding it compensation of 6,000 euros (38). Likewise in the bears' case (39) in the Pyrenees region, it decided that the errors committed by the state had undermined the interests of the association it was defending and had caused it moral damage requiring compensation, estimating that the association was entitled to compensation of 8,000 euros.

The Third Requirement

Proof Of the Causal Relationship in Climate Liability Lawsuits

The causal relationship represents the basic pillar for determining liability, whether based on fault or not, and this link fulfills an essential condition for the establishment of liability in all legal branches. It follows that the establishment of the state's liability for climate change damages is contingent on the damage suffered by the injured party being linked to it in a certain and direct manner.

However, practical reality reveals that the causal relationship constitutes the difficulty on which climate liability lawsuits are shattered (40); For several reasons, most notably the difficulty of detecting environmental changes and attributing them to greenhouse gas emissions, establishing a triple link between human activities and global warming, then attributing the latter to the occurrence of climate phenomena, and finally

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unifying the latter to the occurrence of the alleged damage. Judicial precedents reveal the importance of the role played by scientific causality in proving the causal relationship in climate lawsuits. Therefore, we will discuss the judge's approach to dealing with scientific causality the link between it and legal causality, and its sufficiency for attribution in climate lawsuits as follows:

First - Legal Causality and Scientific Causality

The relationship between legal causality and scientific causality raises an ongoing debate in the field of legal liability, as asserting the existence of a theoretically formulated and materially proven scientific causal relationship does not necessarily entail asserting the existence of a legal causal relationship as a result of the sorting carried out by the judge to assess the causes of the damage, whether he takes the proximate or appropriate cause or the direct cause. The fact that the cause is not acceptable to the judge does not mean at all that the reality did not cause the damage,

but simply that this cause was not considered a justification for the case of attribution from a legal point of view (41).

This distinction in climate justice appears more clearly, as anyone who follows the judge's approach to examining climate lawsuits and the rulings issued in them, whether at the European or American level, will find that courts differ in determining the mechanism for scientific evaluation of climate reports in the facts presented to them to prove the element of error by the state or not. This difference can be attributed to two approaches, one of which relies on the reports of the International Panel on Climate Change and official national institutes, especially in cases brought against the government, where the existence or seriousness of the threat posed by climate change is not questioned. If reliable reports are not available on the specific issue at hand, the opinions of individual experts are resorted to.

This approach has been observed by a part of jurisprudence (42) that has prevailed in European courts in France, Belgium, the Netherlands, and Austria - as previously mentioned - as well as Switzerland (43) and Ireland (44) in dealing with climate issues.

The second approach represents the essence of the American judicial system, in which the judge relies on cross-examination of experts appointed by the parties, and this may go as far as organizing a scientific education program, as happened in the City of Oakland v. BP case (45).

The judges even devote very large pages of their rulings to climate science (46). However, it cannot be said that American judges are ignorant of the official reports issued by international, national, or local assessment bodies. Still, these reports form part of the testimony or statements of witnesses. Their credibility depends largely on their educational background, professional achievements, peer appreciation, and areas of specialization enjoyed by the witness (47). It can be said that climate claims regarding proving the element of error pose a scientific challenge to judicial courts, and that most judges, if not all, believe that consulting the scientific community would provide their decisions with a solid scientific basis in determining the elements of the state's climate responsibility.

Second - Insufficiency of General Causality and Difficulty in Proving Individual Causality

Despite the importance of scientific causality, it may be insufficient in proving general causality and responsibility for climate change damages when it is not productive in proving legal causality, for example, the ruling of the Administrative Court in Montreuil where the court considered that the state committed an error due to the insufficiency of the measures taken in the field of air quality, but there is no direct reason indicating that the insufficiency of the measures taken by the state resulted in the illnesses of the plaintiff and her daughter, and the court refused to rule on compensation based on the lack of a causal relationship (48).

Also in the case of Washington Environmental Council v. Bellon, The failure of state agencies responsible for enforcing the Clean Air Act in Washington to regulate greenhouse gas emissions from the state's five

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oil refineries, which require states to use refinery control technologies [49], and the circuit assumed that human-made greenhouse gas emissions are generally causally linked to climate change, but found that the plaintiffs failed to establish a sufficient causal link. A plaintiff must prove that he or she suffered an injury, that the injury was caused by the defendant's actions, and that the injury is likely to be recoverable if the court awards the requested compensation. Although the court emphasized that as a result of climate change, the environmental plaintiffs suffered a variety of injuries ranging from flooded farmland to reduced ability to enjoy Washington State's ski slopes, the connection between these injuries and the failure of state agencies to regulate greenhouse gas emissions was too weak to satisfy the causation element necessary for justiciability, because a large number of other causes may be responsible for the changes that contributed to the harm.

What confirms the difficulty of adhering to scientific causality to prove legal causality is the difficulty of attributing harm to a specific actor, i.e. proving individual causality.

Although the European Court of Human Rights has established the individual responsibility of states in combating climate change, as we have previously indicated, it confirms that the specificity of the issue of causality in climate lawsuits requires that, for the state to be individually responsible toward individuals, there be a causal relationship between the risk in question and the alleged violation, and that the negative consequences of the government's actions or inaction be significant, and that the individual be subject to severe harm. This is because the negative effects and risks to which certain individuals or groups of individuals living in a specific place are exposed result from all global greenhouse gas emissions, and emissions from a specific country represent only part of the causes of harm. Therefore, the causal relationship between the actions or omissions of national authorities in a country, on the one hand, and the harm or risk of harm resulting from that in that country, on the other hand, is necessarily weaker and indirect only in the context of harmful pollution of local origin (paragraphs 437-438-439) [50].

Third: Means Of Overcoming the Difficulty of Proving Causality in Climate Lawsuits

To overcome the difficulties of causality, the judiciary resorts to what is known as probable causality to overcome scientific uncertainty through evidence or the indicators used by the judge. This is evident from the judicial precedents related to the green algae case in France. The court confirmed that the state committed an error by not adequately controlling water quality and the spread of pollution of agricultural origin in the soil, especially by not respecting European regulations. These shortcomings initially led to very large nitrate pollution in the water, and then to the proliferation of green algae on the coast of Breton.

The court also believes that the additional cost of transporting and collecting algae constitutes financial harm to the municipalities, which is directly and certainly related to the state's unlawful errors [51].

In another ruling, the Administrative Court of Appeal of Nantes confirmed the responsibility of the State after the death of a horse due to green algae [52] and held the public authorities responsible for the spread of algae related to the protection of waters from pollution of agricultural origin. The Court then considered, through the elements presented for its assessment and the possibility of determining the circumstances in which the accident occurred to the deputy and his horse, that the death of this animal should be considered to have occurred as a result of poisoning by inhaling the toxic gas emitted by the decomposition of green algae in the mudflat where the deputy and his horse were stuck. The Court considered that the deputy, who knew the place because he usually went there, was reckless when he took his horse to a part of the beach of Saint-Michel-en-Grève that was particularly exposed to the presence of green algae.

In this regard, it noted that a sign posted at the entrance to the beach advised users not to approach areas stranded by decomposing algae and warned of health risks. Thus, the Court decided to share responsibility between the deputy and the State and to place a third of the responsibility on the latter. On these grounds, the Court ordered the State to compensate the damage caused to the deputy due to the death of this animal, considering this sharing of responsibility.

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Likewise, in the air pollution case, the administrative judge relied on judicial expertise (53) and evidence to overcome the difficulties of causality; through several additional criteria, including the temporal correspondence between the worsening of the symptoms observed in the children (particularly recurrent bouts of otitis media, ear discharge, and purulent rhinitis) and the periods during which air pollution thresholds were exceeded, particularly between March 2015 and August 2018. The elements considered include the duration of the children's stay in Ile-de-France, the places they frequented and their successive residences, as well as the chronology of the pathological manifestations and their development over time. The court then recognized the existence of a causal relationship between the periods of exceeding the limits of the concentration of pollutants in the air and the physical harm caused to the children. The judge of the Administrative Court in Paris then concluded that the suffering suffered by the affected children, both physically and morally, must be fairly assessed; and thus ordered the state to compensate (54). It is noted that the judge, to overcome the obstacles of causation, may himself summon experts to provide their testimony or go himself to the site of the damage, as happened in the case of Luciano Lliuya v RWE AG, where the court decided to visit the plaintiff's home based on the experts' recommendation. The field visit was carried out in May 2022, and this visit aimed to verify the availability of a causal relationship between the melting of the Balcaraju Glacier and the activities of RWE (55).

In the case of the century, the Administrative Court of Paris concluded that evidence of the actual level of greenhouse gas emissions, which consists mainly of reliable studies and reports on greenhouse gas emissions, is sufficient to prove a causal relationship between the insufficient measures by the State and the damage to the environment, and awarded the plaintiffs one euro as required for moral damage resulting from this inaction (56). The ruling of the Administrative Court of Paris in the Justice pour le vivant case constitutes a recent judicial precedent that is added to the previous precedents, as it concluded that there is environmental damage resulting from widespread, widespread, chronic and permanent pollution of water and soil due to active substances to protect plants, a decline in biodiversity and biomass, and damage to the benefits that humans derive from the environment (57).

Likewise, in the Julian case, the court recognized the existence of a causal relationship, as it decided that the plaintiffs met the criteria for accepting the claim, but it paid special attention to the issue of compensability and acknowledged that compensability and causality are closely linked. The fact that causality is scientifically complex does not mean that it is impossible, nor that the defendants will not be able to comply (58). It appears from the above that overcoming scientific uncertainty in the field of climate claims is possible by using expertise or factual or probabilistic evidence. All these elements give the judge flexibility in assessing the causal relationship, through which he can overcome the difficulties of proving it, given the specificity of climate claims.

Section Two

The Specificity of The Effects Arising from Climate Liability

The origin of the traditional liability rules is that once the elements of liability are proven, the person who caused the damage is obligated to repair it. However, compensation for climate damage has its specificity due to the impossibility of applying ordinary forms of compensation, as many of the damages of climate change exceed personal damage and cannot even be assessed in money, especially if the compensation is related to a country or region that climate change has caused to sink or displace its population due to the exacerbation of the danger. Such damages and other massive environmental damages are irreversible (59).

Therefore, environmental judicial precedents in general and climate lawsuits, in particular, are based on the preventive responsibility of the state, which requires its intervention without waiting to prevent the risks of damage, even if it is not certain according to scientific knowledge. If the state is lax or does not intervene, then its preventive responsibility is realized, provided that the damages are serious (60); In addition to the above, the nature of compensation raises another problem: should the compensation be in kind or cash? This is what we will discuss in some detail as follows.

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The First Requirement

In-Kind Compensation for Climate Damage

Compensation in kind means: fulfilling the obligation in kind, i.e. obligating the person responsible for the occurrence of climate damage to pay the injured party something other than money or to perform work for his benefit. Most environmental legislations have taken a path that gives the judge priority to compensation in kind for environmental damage,

such as the text of Article 171, Paragraph 2 of the Egyptian Civil Code, which states: "Compensation is estimated in cash, but the judge may, depending on the circumstances and upon the request of the injured party, order the restoration of the situation to what it was, or rule to perform a specific matter related to the illegal act, as compensation." Article 43 of the Saudi Environmental System also states that: "The violator must remove the effects resulting from the violation, rehabilitate and pay compensation, by what is determined by the regulations." Article 1246 of the French Civil Code also states that: "Every person responsible for environmental damage must repair it." Article 1247 specifies that reparable environmental damage is "a major assault on the elements or functions of ecosystems or on the collective benefits that humans derive from the environment." In principle, according to the text of the first paragraph of Article 1249, compensation for environmental damage must first be made in kind, meaning that concrete remedial measures must be taken to restore the damaged environment (61).

If this proves to be legally impossible or insufficient in reality, such as if the cases of aggression are legally serious and disproportionate to the rights of others, or if the damage is real and cannot be reversed and compensated with a natural equivalent or repaired due to the lack of sufficient scientific or technical knowledge, the judge may order the responsible person to pay monetary compensation under paragraphs 2 and 3 of Article 1249 of the Civil Code, or the judge may combine compensation in kind and monetary compensation, which will be used to repair the environment by the polluter pays principle, and the assessment of the damage takes into account the compensation measures already implemented (62).

In the case of the century, the Administrative Court of Paris rejected the request for monetary compensation for environmental damage and decided that compensation should be primarily in kind. That compensation would only be granted if compensation measures were impossible or ineffective, and decided to grant the plaintiff associations a symbolic sum of "one euro" as moral compensation (63). The plaintiff associations submitted a new request on June 14, 2023, asking the administrative judge to order the state to pay a financial penalty of 1.1 billion euros corresponding to 9 chapters of delay in taking effective measures to combat climate change; however, the court rejected the associations' request in its ruling dated December 22, 2023, and concluded that the rate of decline in greenhouse gas emissions observed in 2023 did not make it necessary to issue an additional enforcement measure (64).

In the Grande Cent case, the plaintiffs requested the Council of State to extract all the consequences arising from the government's failure to implement the measures issued by the Council's ruling on 19 November 2020,

by imposing a fine of up to 50 million euros for every six months of delay. However, despite the Council's confirmation that the government had not taken sufficient measures to implement its ruling, it took into account the government's behavior (the steps that had been implemented and those that were still likely to be implemented) and considered that at this stage it was not appropriate to issue a penalty, and was satisfied with ordering the government to take new measures by 30 June 2024 at the latest and to submit a progress report from 31 December 2024 detailing these measures and their effectiveness (65). This approach is extended to environmental disputes. In the case of the Justice of the Living, after the Administrative Court in Paris decided that there was environmental damage resulting from widespread, widespread and permanent pollution of water and soil due to the active ingredients of plant protection products and their impact on the deterioration of biodiversity and the state's responsibility for preventive measures, the court ordered the government to take all useful measures that would repair the environmental damage and prevent the damage from worsening by restoring consistency in the rate of reduction in the use of these

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products, provided that this repair is completed by June 30, 2024 AD, and ruled in favor of the associations to pay the sum of one euro as symbolic compensation for the moral damage they suffered (66).

Second Requirement

Monetary Compensation for Climate Change Damage

Monetary compensation for climate change damage means obligating the person responsible for the damage to pay a monetary sum to the injured party corresponding to the damage suffered by the injured party. The party concerned with compensation may be the state if the physical or moral damage occurred to the person of the injured party or his property, while if the damage occurred to an element of the environment, the state is the party concerned with the compensation claim. Regardless of who is responsible for compensation, monetary compensation in the field of environmental liability in general and climate disputes, in particular, faces several obstacles due to the difficulty of determining the damage as mentioned above, the date of its occurrence, and determining who is responsible for it and its type, whether it is material or moral, total or partial. All these obstacles and others related to the specificity of climate disputes represent obstacles in the field of determining monetary compensation, and therefore this compensation is considered a precaution to which the judge resorts if compensation in kind is impossible (67). Looking back at the French judicial decisions, it becomes clear that the judiciary has gradually developed the rules applicable to compensation for environmental damage.

Some cases that preceded the 2008 Environmental Damage Laws led to the award of monetary compensation. For example, in the Erika case (68), the oil group responsible for the oil spill was ordered to pay civil compensation for pollution of the marine environment and the coast. Also, in the Braconniers des Calanques case, the Court of Appeal of Aix-en-Provence ruled, on 29 June 2021, that fishermen must pay compensation for environmental damage resulting from the capture of large quantities of sea urchins, groupers, and fish, in protected areas close to fishing (69).

In a first-of-its-kind legal precedent, the Paris Administrative Court concluded that the suffering suffered by children affected, both physically and morally, by air pollution in the Île-de-France region must be fairly assessed, and therefore ordered the State to pay two separate amounts: €2,000 in compensation for the damage suffered by the plaintiff in the context of the first case (No. 2019924/4-2), and €2,000 in compensation, accompanied by an additional €1,000 in compensation for the disruption of living conditions in the context of the second case (No. 2019925/4-2) (70). The Court's poor assessment of compensation raises doubts about its effectiveness in redressing the damage, given the seriousness of the damage suffered by the plaintiffs in this case (71).

It is noted that monetary compensation for environmental damages can be allocated exclusively to environmental restoration, in defiance of the rule of freedom to use monetary compensation, as if compensation were granted to associations defending the climate and the environment. This can be seen from what happened in the air pollution case filed by the French Friends of the Earth Association, and the Council of State's ruling was issued on July 12, 2017, obligating the government to take sufficient measures to ensure compliance with the limit values for nitrogen dioxide, and compliance with the limit values applied to fine particle concentrations related to air quality. However, the Council found that the measures taken by the government were insufficient to achieve the objectives, so it imposed a fine of 10 million euros for every six months of delay, under its ruling issued in August 2021. The applicants requested the Council of State to increase the penalty imposed by the decision issued on July 10, 2020, but the Council of State decided in its ruling issued on November 24, 2023, not to modify the amount of the semi-annual penalty, and obligated the state to pay a total amount of 20 million euros for the periods of delay for the periods from January 11 to July 12, 2023. The value of the penalty was distributed between Friends of the Earth, which initially contacted the State Council in 2017, and several organizations and associations involved in combating air pollution (72).

Given the difficulties facing the issue of compensation for climate damage, whether in-kind compensation and its inappropriateness in many cases due to the impossibility of repairing the damage, or

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even monetary compensation, which faces multiple problems before national courts due to its inappropriateness if the damage is related to the state or an element of its environment, or due to the difficulty of assessing it, and the impossibility of proving the causal relationship as mentioned above, or identifying the person responsible for the damage, for all of this, another means of obtaining compensation has been created through special funds, which will be presented as follows.

Third Requirement

Non-Traditional Means of Compensation for Climate Change Damage

Non-traditional means of compensation for climate change damage are of great importance, whether at the international or national level; as some jurisprudence views compensation for climate damage as a moral responsibility that requires social solidarity at the international and national levels to recognize responsibility and discuss adaptation efforts (73), and mitigate the harmful effects of this phenomenon; By improving the scientific and research capabilities of groups at risk from climate change, these efforts can be a form of compensation such as insurance schemes, technology transfer, or financing through climate financial instruments as well as national compensation funds. These forms will be discussed as follows:

First - Financing Climate Change Measures at The International Level

The climate change crisis represents a unique ethical and political challenge, as continued carbon emissions constitute additional damage; therefore, reform requires moving from justice in distributing compensation to treatment through implementing immediate and appropriate measures to mitigate and adapt to the effects of this phenomenon. Therefore, financing is used as an effective means to promote and implement mitigation and adaptation measures, which was confirmed by the United Nations Framework Convention on Climate Change, as it included obligating countries listed in Annex I to reduce emissions and promote and facilitate the transfer of climate-friendly technology, due to the stark differences in their historical contributions to climate change. The Kyoto Protocol reflected these obligations, as it included a condition requiring these countries to reduce their emissions to about five percent below 1990 levels. The Paris Agreement approved the principle of common but differentiated responsibility and the duty of

developed nations to provide financial resources to help developing countries and island states confront the effects of climate change.

At the European Union level, EU leaders declared that countries should contribute financially to measures aimed at mitigating and adapting to global warming, especially in the least developed countries, and that the main principles of contribution should be the ability to pay and responsibility for emissions (74). Climate compensation would provide an agreed framework for reform while giving a voice to the climate-vulnerable and moral force to their claims. The European Investment Bank provides loans in the environment, such as financing urban transport projects and the Pan-European Carbon Fund, which allows the exchange of carbon credits. The Bank also provides financing to support renewable energy to reduce greenhouse gas emissions.

Despite repeated calls at the international level to compensate for losses and damages, there were multiple resistances from rich countries regarding the failure to establish a financing fund, and it was completely removed from the final agreement at the Conference of the Parties in Glasgow COP26. However, these calls were successful at the Conference of the Parties in Sharm El-Sheikh COP27, and the Global Climate Fund was established. The Conference of the Parties held in the Emirates COP28 succeeded in activating this fund and securing early pledges from countries to finance it, amounting to $792 million, in addition to activating the Adaptation Fund and securing funding for the Least Developed Countries Fund and securing funding for the Special Fund for Climate Change (75). The importance of these cooperative efforts appears in providing preventive means through development projects and financial tools that help countries mitigate the effects of climate change and adapt to this phenomenon.

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The "polluter pays" principle comes as a legal economic tool that contributes to global responsibility for the effects of climate change, as this principle is different compared to the principle stipulated in the United Nations Framework Convention on Climate Change (Article 3.1), about "common but differentiated responsibility based on respective capabilities", i.e. common but differentiated responsibility based on the different capabilities of each party. From an economic perspective, the polluter pays principle, which is applied through a variety of economic tools, contributes to absorbing the costs of environmental damage and losses and improving current adaptation efforts, which fall under the category of so-called gradual adaptations (76). However, these adaptation policies may be insufficient to address transformative changes, which require new innovative national strategies and government intervention to address losses and damages resulting from climate change (77).

Second - Forms of Compensation for Climate Damage at The National Level

Since traditional liability systems in their various forms face multiple obstacles and difficulties in compensating for climate change damage, it may be appropriate to confront its risks through national social solidarity, since the state, regardless of its contribution to climate change or not, does not exempt it from the responsibility of taking adaptation and mitigation measures and reducing emission levels (78), and countries must seek means to finance these measures, whether the financing is through international efforts as previously mentioned, or at the national level through compensation funds or innovative climate tools, or taxes on financial transactions. Among the applications of compensation funds at the national level is the National Agricultural Disaster Guarantee Fund in France. The agricultural disaster system targets agricultural contractors who are victims of damages caused by uninsurable climate risks of exceptional importance. According to the law issued on March 2, 2022, which includes directives related to improving the dissemination of crop insurance in agriculture and reforming climate risk management tools in agriculture, which entered into force on January 1, 2023 (79), insurance products and effective compensation mechanisms have been created and disseminated to support adaptation strategies for agricultural sectors and production areas. This law enshrines the possibility of national solidarity intervention in the event of so-called catastrophic climate risks, so the state intervenes to compensate uninsured farmers in the event of severe losses exceeding 30% of production.

Also, the Amazon Fund, which is based on national donations amounting to $1,288 million, has approved approximately 103 projects aimed at mitigating the effects of climate change, as well as the Climate Change Fund in Indonesia, and regionally the Central Africa Forest Initiative Fund and the Congo Basin Forest Fund (80), the Nature-Based Climate Solutions Fund in Canada (81), the Environmental Protection Fund in Egypt, which was established under Article 14 of Law No. 4 of 1994, the Saudi Environment Fund, which was established under Cabinet Resolution No. 416 dated 7/19/1440 AH, and the Saudi Fund for Development, which has important contributions through its development activities to mitigate the effects of climate change, by supporting many solar and hydroelectric energy projects. In addition to the idea of funds in the field of climate risk financing, innovative climate instruments such as green bonds, which are debt bonds or fixed-income securities that aim to finance projects related to the environment specifically related to climate (82), such as energy transformation projects or developing renewable energy sectors and improving their use efficiency, as well as clean transportation projects that aim to reduce greenhouse gas emissions (83).

Taxes on financial transactions are also effective, such as including climate risks in financial transactions such as loans or insurance. One of the most prominent applications of taxes is the carbon tax, which is a single pricing system for greenhouse gases that determines the prices of greenhouse gas emissions. The carbon tax is applied to the purchase or use of fuels such as gasoline, diesel, natural gas, heating fuel, and coal unless a specific exemption is applied; the carbon tax is also applied to combustible materials. The carbon tax is also linked to tax exemptions allocated to projects producing or importing fuels as an incentive to include biofuels without fuel produced from palm oil.

However, such proposals raise legal problems, as the Council of State in France ruled that the carbon tax was unconstitutional based on the law that imposed it violating the principle of equality before public burdens; The law exempted a large number of emissions from certain industries, which constitute 93% of

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carbon emissions, while subjecting less polluting activities to the tax, which is contrary to the purpose of the law and contradicts the principle of equality before general taxation (84). The Supreme Court of Canada ruled on the constitutionality of this tax (85); stating that the threat posed by climate change requires a coordinated national approach that the Canadian federal government has the authority and jurisdiction to address; The Greenhouse Gas Pollution Prices Act, enacted in 2018, constitutes Canada's national framework for carbon pricing, and under this framework, provinces and territories have the flexibility to implement their pricing systems as long as they meet a set of minimum stringent criteria. In contrast, the Constitutional Council in France ruled that the text that provides incentive tax benefits for projects that decide to include biofuels without those extracted from palm oil is constitutional (86), considering that the cultivation of oil plants, specifically palm oil cultivation, poses environmental risks that may indirectly lead to an increase in greenhouse gases, there is no doubt that the adoption of such tools may contribute to reducing and controlling the risks of climate change.

Conclusion

The research revealed that climate justice poses a challenge to the administrative judge, specifically in the field of liability for climate damages, as it presents a legal dilemma given that polluters often fall outside national borders and it is difficult to determine the state's responsibility for the element of fault, as well as to prove the causal relationship in climate lawsuits.

It is also evident from case law that the phenomenon of litigation on climate change lacks a regulatory framework and the inability to secure compensation for those affected by climate change or to compel the implementation of international agreements. However, in the long term, the ability of courts at the international and national levels to develop climate law should not be ruled out. The judiciary has proven on several occasions throughout history its response to the developments of evolving life. We can sense this approach through the behavior of the French administrative judge in overcoming the difficulties of causality and his adoption of a developed approach that helps him overcome these obstacles and rely on flexible means to prove the causal relationship and overcome scientific uncertainty by using experience factual evidence,

or probable causality. All these elements gave the judge flexibility in assessing the causal relationship, through which he was able to overcome the difficulties of proving it in several case laws.

Besides, the research illuminates that climate damage liability claims can accelerate the legislative process in favor of more effective provisions in the field of climate, and push stakeholders to act more responsibly in combating climate change. Also, seeking to regulate the climate compensation framework at the international or national level through unconventional methods provides an effective means to overcome obstacles to compensating victims and dealing with those responsible for this phenomenon in a cooperative manner in approach and comprehensive solution.

Therefore, the researcher recommends calling for accelerating the legislative process at the international and national levels in favor of more effective provisions in the field of climate, specifically about liability for climate change damages, to regulate the regulatory framework for these claims and ensure the implementation of international agreements related to climate change. Likewise, international and national law must have a harmonious vision of climate change; to regulate a legal framework that defines the mechanism for financial compensation for climate change damages that still need to be clarified, as well as continue to raise awareness of the issue of climate change and mobilize society on the need to mitigate climate change, and highlight the dire consequences of climate change on the environment; It may lead to enhanced political support for mitigation actions by national governments and other actors, and prompt the judiciary at the international and national levels to address claims of liability for the effects of climate change. A sophisticated judiciary has demonstrated its ability to carefully consider new and complex issues and to issue convincing and meaningful decisions on States' obligations to mitigate climate change and liability for damages from this phenomenon.

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