Black Sea Journal of Engineering and Science
doi: 10.34248/bsengineering.1551768

Open Access Journal
e-ISSN: 2619 – 8991

Research Article
Volume 7 - Issue 6: 1270-1279 / November 2024

INSURANCE SOLUTION FOR CLIMATE CHANGE: LEGISLATION ANALYSIS IN TÜRKİYE

Aynur AYDIN[1], Nimet VELİOĞLU[1]*, Mohammad Chehreh GHANI[1]

[1]*Istanbul University- Cerrahpaşa, Faculty of Forestry, Department of Environmental and Forest Law, 34473, Istanbul, Türkiye*

Abstract: In the light of changing and evolving parameters throughout the World, risk definitions vary as well, leading to the necessity to make new risk definitions in various fields in addition to those, the effects of which can be easily observed and measured, such as technology and information security. This change also manifests itself in the insurance industry based on climate change. The increase in the number and scale of climate-based natural disasters throughout the World, in conjunction with global warming, made the economic losses caused by natural disasters visible. Climate change A caused and will continue to cause significant changes in many fields of the insurance industry, such as property insurances, agricultural insurances, and health insurance. The insurance industry attempts to mitigate the negative impacts of climate change through active risk measures such as mapping, risk analysis, funding research, collective data sharing, and active participation in climate protection activities throughout the World. However, it is crucial for the State and affiliated public enterprises to support this process as a regulatory and adequate power, create a suitable legal, financial and regulatory framework for private sector initiatives, and conduct informative activities about the importance of insurance in natural disasters. Emerging financial burden should be divided between individual-public-private enterprises, and this division should be made in a balanced and fair manner in the light of the applicable legislation. This study primarily addresses the devastating impacts of climate change on the World and Türkiye, which emerged notably in the recent era and the financial burden brought about by this. Then the issue of responsibility of the public sector, which is responsible for taking necessary and adequate measures against climate change, was explored in the context of both national legislation and international agreements. The adequacy of the applicable legislation for the State and public enterprises to create a suitable consciousness-raising, a preventive and compensatory legal framework specific to the climate change in Türkiye was reviewed, and suggestions were made.

Keywords: Climate Change, Legislation, Insurance solution, Risk, Responsibility.

***Corresponding author:** Istanbul University- Cerrahpaşa, Faculty of Forestry, Department of Environmental and Forest Law, 34473, Istanbul, Türkiye
E mail: nimet@istanbul.edu.tr (N. VELIOĞLU)
Aynur AYDIN https://orcid.org/0000-0003-3647-6150
Nimet VELİOĞLU https://orcid.org/0000-0003-0031-5697
Mohammad Chehreh GHANI https://orcid.org/0000-0001-5785-7169

Received: September 17, 2024
Accepted: October 22, 2024
Published: November 15, 2024

Cite as: Aydın A, Velioğlu N, Ghani MG. 2024. Insurance solution for climate change: legislation analysis in Türkiye. BSJ Eng Sci, 7(6): 1270-1279.

1. Introduction

Climate change will have many knowable and unknowable effects on humanity in the upcoming years. Climate change is now a serious issue that affects are already has been observed in every country. Since almost everyone will be affected by climate change, there is a need for plans to increase the resistibility of humanity against the coming physical and financial impacts of changes. In addition, climate change increases the frequency and intensity of extreme weather events worldwide. Its effects on lives, livelihoods, and assets are not evenly distributed and threaten efforts to reduce poverty sustainably. Disasters force 26 million people into poverty each year. The cost of responding to disasters will continue to increase and force countries to divert longer-term development finance into short-term response measures frequently.

By 1995, countries launched negotiations to strengthen the global response to climate change and, two years later, adopted the Kyoto Protocol. Then, the 2015 Paris Agreement, adopted in Paris on 12 December 2015, marks the latest step in the evolution of the United Nations climate change regime and builds on the work undertaken under the Convention. The Paris Agreement charts a new course in the global effort to combat Climate Change. The Agreement also aims to strengthen the ability of countries to deal with the impacts of climate change. After thinking globally about climate change, we should focus on our region very well to be able to act locally first. Türkiye is one of the countries with a wide variety of climates and will be affected from different aspects. Due to its geographic location, both socio-economically and politically, Türkiye is a sensitive country that will be negatively affected by the possible side effects of global warming. Because of potential threats of its location, Türkiye is among the countries that will face problems arising from the climate change.

Therefore, how can the Turkish government and people increase the resilience against the climate change risks amongst the poorest and vulnerable people? Climate risk insurance comes into play at this stage. Climate risk insurance is a means of obtaining insurance against the

dangers of extreme weather events. What may be an incalculable drama for individuals or individual governments can become a calculable risk for the insured community. Climate risks insurance is gaining importance in and beyond climate negotiations and offers, many opportunities for improving climate risk management in developing countries. After the 2015 United Nations Climate Change Conference, Group of Seven (G7) countries at their summit in Germany, the leaders launched a new Initiative on Climate Risk Insurance (InsurResilience), pledging to bring climate insurance for 400 million currently uninsured individuals in developing countries by 2020. In many ways, the G7 initiative and the Paris Agreement are the culmination of a long process to establish insurance as an accepted climate adaptation instrument (Surminski et al., 2016). So that, we need to have a solid legal framework for any action.This research aims to analyze the adequacy of existing legislation in Türkiye by focusing on climate change insurance. It includes the study of physical and financial risks of climate change, especially in Türkiye, the international and local dimensions of Turkish government responsibility, and the study of exiting legal bases and solutions in Turkish legislation with providing a structure of successful samples of Turkish Natural Catastrophe Insurance Pool.

2. Materials and Methods

2.1. Climate Change Effects

How to respond to the damage caused by climate change continues to be asked in the scientific world. In addition, at the same time, the effects of climate change are increasing in the world while we are trying to establish various ways and methods. These climate change effects can be classified as physical and financial effects.

2.2. Expectative Physical Risks

The world is warming up. The Intergovernmental Panel on Climate Change (IPCC) forecasts a temperature rise of 2.5 to 10 degrees Fahrenheit over the next century. The IPCC predicts that increases in global mean temperature of less than 1 to 3 degrees Celsius above 1990 levels will produce beneficial impacts in some regions and harmful ones in others. Net annual costs will increase over time as global temperatures rise. The IPCC states, "The range of published evidence indicates that the net damage costs of climate change are likely to be significant and to increase over time.

Projections of future climate over the U.S. suggest that the recent trend towards increased heavy precipitation events will continue. More droughts and heatwaves. By the end of this century, what have been once-in-20-year extreme heat days (one-day events) are projected to occur every two or three years over most of the nation.

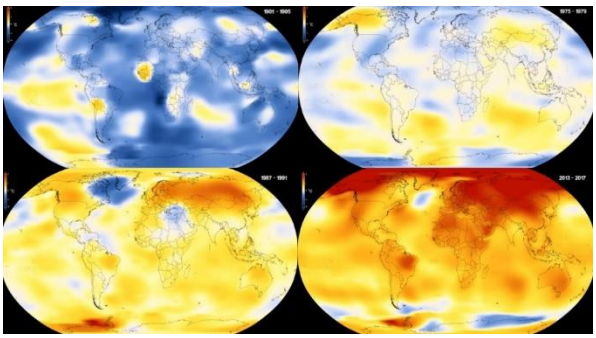

Figure 1. Temperature changes around the world from the year 1901 to 2017.

Hurricanes will become stronger and more intense. The intensity, frequency, and duration of North Atlantic hurricanes and the frequency of the strongest (Category 4 and 5) hurricanes have increased since the early 1980s. Hurricane-associated storm intensity and rainfall rates are projected to increase as the climate continues to warm. Sea level will rise 1-4 feet by 2100. Global sea level has been increased by about 8 inches since reliable record-keeping began in 1880. It is projected to grow another 1 to 4 feet by 2100. This results from added water from melting land ice and the expansion of seawater as it warms.

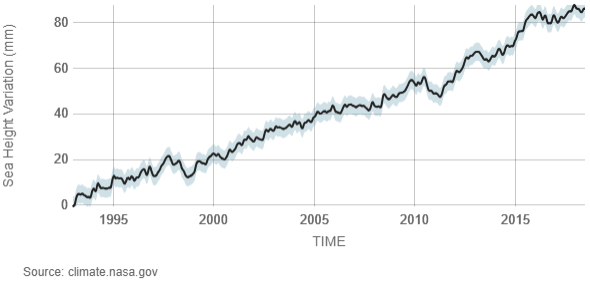

Figure 2. Global sea level from the year 1901 to 2017.

In addition, thousands of wildfires, large and small, are underway at any given time across the globe. Beyond the apparent immediate health effects, this "biomass" burning is part of the equation for global warming (Röder et al., 2024). In northern latitudes, wildfires are a symptom of the Earth's warming. Moreover, research suggests that a hotter Earth resulting from global warming will lead to more frequent and more extensive fires. The fires release "particulates," tiny particles that become airborne and greenhouse gases that warm the planet (Finneran and O'Sullivan, 2010).

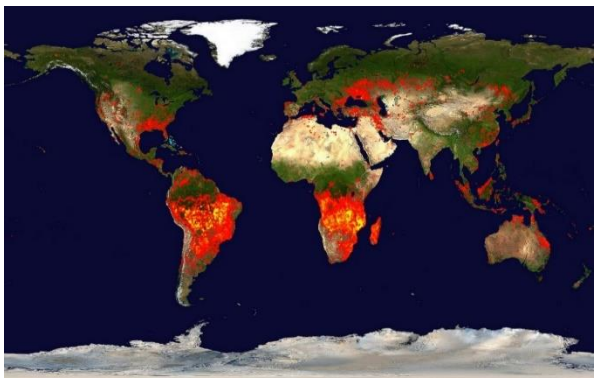

Figure 3. The moderate resolution imaging. Spectroradiometer (MODIS) on NASA's Terra satellite shows fires around the world.

In the local scale of this study, we will focus on Türkiye. In Türkiye, the annual temperature over the period 1961–1990 showed a trend of statistically significant warming over land in southeast Europe of approximately 0.4–0.6°C per decade. The statistical analyses of the Turkish temperature series over the period 1950–2006 showed a turning point in 1992 (1993). Following this year, annual temperatures began to increase gradually (Doğan et al., 2020).

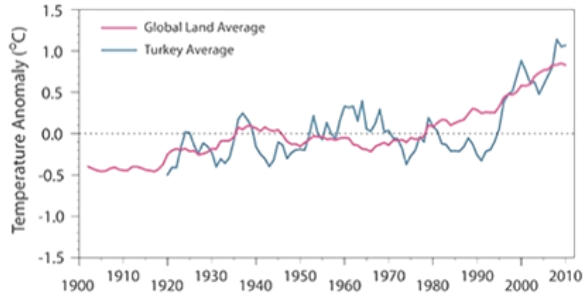

Figure 4. Average annual temperature in Türkiye from the year 1901 to 2010.

The below maps will show the model-estimated mean annual temperature distribution in Türkiye for three different periods, 1961-1990, 2041-2070, and 2071-2099. The temperatures range from about 18°C in the southern coastal areas to below 4°C in much of the high eastern plateau. As the comparison with the observed temperature shows, the simulated 1961-1990 temperature is relatively accurate. Comparing future maps with the 1961-1990 maps indicates that the temperature will increase all over Türkiye. The increases can be observed more clearly in the change maps of 1961-1990, 2041-2070, and 2071-2099 (Şen, 2013).

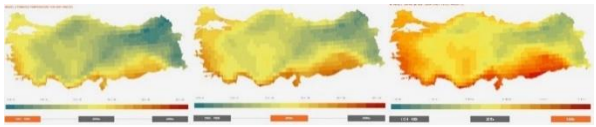

Figure 5. Model-estimated mean annual temperature distributions in Türkiye.

So, what are the results of the temperature increase in Türkiye? There is no comprehensive research that cans clearly shows the possible physical risks related to Türkiye. Authors reached different kinds of papers that evaluate climate risks separately, focusing on floods, sea rise, forest fires, etc. Since it is impossible to explain all the climate risks in this study, we have chosen forest fire as a sample. Because of the substantial amount of Turkish society in direct or indirect interrelating with forest-related events, we think that temperature increase will have huge effects on southern parts of the country, especially the Mediterranean region.

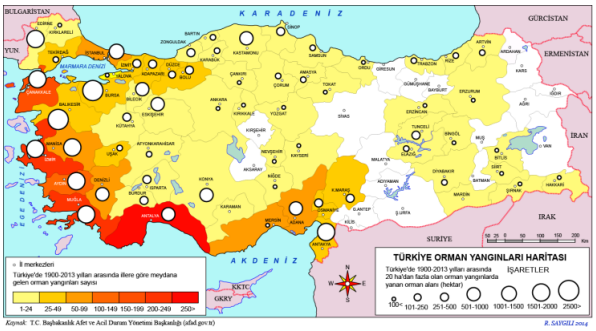

Figure 6. Distribution of forest fires in Türkiye between the years 1900 and 2013.

According to Alcamo et al. (2022) forest fire danger, fire season length, and fire frequency and severity are very likely to increase in the Mediterranean. Previous forest fire counts in Türkiye indicate that the forests along the Mediterranean, Aegean, and Marmara regions are already at high risk. The number of forest fires increases substantially on hot summer days when these areas, characterized by a typical Mediterranean climate, receive little or no rain. As the climate change projections indicate that the temperatures will continue to rise while rainfall decreases, we could expect more forest fires in these areas in the future. The areas with fewer fires may also be subjected to more forest fires in the future. It will be complicated to sustain the present forest cover, especially in the southern and western parts of Türkiye, when the air gets warmer and dryer (Şen, 2013).

Expectative Financial Risks

The first effects of climate change are caused by temperature rises and fluctuations in the precipitation regime. Extremities in these climate elements cause severe economic losses by increasing the frequency and severity of climate-related natural disasters such as drought, flood, and storm. Approximately 87% of natural disasters experienced during the 1980-2012 period are natural disasters caused by climate. The economic loss caused by these natural disasters in the same period was approximately $ 2.8 trillion. When analyzed on an annual basis, this FIGURE corresponds to $ 85 billion. These economic losses caused by climate change are estimated to be around 1 trillion dollars per year in 2050, people (Hallegatte et al., 2014) In addition, in another study in the USA costing out the effects of climate change,

Episodes of severe weather in the United States, such as the present abundance of rainfall in California, are brandished as tangible evidence of the future costs of current climate trends. Figure 5 shows the estimated total direct damage to the US economy per year in response to global mean temperature changes (Hsiang et al., 2013).

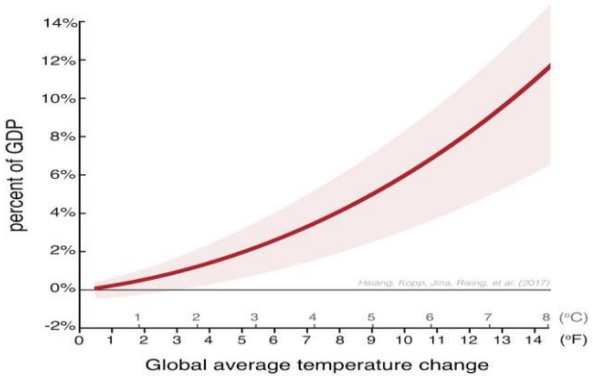

Figure 7. National average economic damage in USA.

In the local scale of this study, we need to focus on Türkiye. However, after studying the global literature about the financial risks of climate change, we may state that still there is no detailed risk assessment in most countries, including Türkiye. Nevertheless, according to Hsiang et al., research in 2017, the average 2 °C of increase in temperature will damage approximately 1.5 % of the Gross domestic product (GDP) in the USA. So, since there is no clear assessment in Türkiye, if we extend this estimation of USA data to Türkiye, to reach out at least a general overview for upcoming years, Türkiye with a GDP of 851.1 billion USD in 2017, will face with estimated financial damage of 12.7 billion USD. The point is that the mentioned cost may happen if the world conforms to the Paris Agreement. So, more than the Paris Agreement goals, the more temperature increase means more damages to GDP of countries.

3. Results and Discussion

3.1. Is The Insurance Sector Responsible For Losses Resulting From Climate Change?

Increasing the frequency of global warming and disaster incidents worldwide force insurance companies to identify areas that are sensitive to disasters, create significant risk areas, determine the measures to be taken against risks, and meet the damages of the insured after the disaster, and so on. Have undertaken essential tasks. In addition, some countries provide partial or complete governmental support to ensure insurance companies in areas with high risks (Türkeş and Deniz, 2010). The insurance industry is a critical part of the solution. It is neither the polluter nor the climate policy setter, but it plays a crucial role in building socio-economic resilience and enabling economic development and entrepreneurial pathways for achieving climate change goals and targets. The industry contributes significantly to creating financial stability to extreme events and other physical risks by providing risk information and risk pricing expertise, offering innovative risk transfer products and services, and improving the distribution channels and payout mechanisms (Golnaraghi, 2018).

In this context, the role and importance of risk reduction must be emphasized, and where possible, the underlying risks and associated drivers must be proactively reduced. Insurance and risk-transfer instruments become most effective and efficient when addressing residual risks that cannot be eliminated. More intensive risk-reduction efforts alongside risk finance strategies focusing on expanding insurance markets in emerging economies are urgently needed. Indeed, growing evidence shows that countries with greater penetration of insurance coverage experience faster economic recoveries from disasters and rebuild with greater resilience to future disasters. A 1% increase in insurance penetration reduces the disaster recovery burden on taxpayers by 22% (Madeleine et al., 2018).

The political commitments coming from the Group of Seven (G7) and the Paris Agreement have been supported and welcomed by several insurance companies and industry initiatives such as the Munich Climate Insurance Initiative, Climate Wise, and the Geneva Association (Alcamo et al., 2022) But, since natural disasters' damages and physical losses are large, the insurance sector and the government undertaking the risks together in most countries. For Instance, in France and Spain, natural disaster insurance is under statutory and unlimited governmental insurance. In the USA, the state is directly responsible for the flood risk. In Switzerland, natural disaster insurance is mandatory in policies. However, the state does not provide a definite guarantee. In this regard, insurance companies have developed joint programs (Acar, 2006).

In Türkiye, failure to establish the whole meaning of the insurance conditions, the most significant realization of expected risk and not enough pool of policyholders, poses obstacles to providing appropriate insurance coverage rates and forcing the state's annual budget to separate a great source against natural disasters. Therefore, it would be fair to develop a state-funded insurance system against natural disasters in Türkiye. Türkiye has enough experience in this aspect. In 2005, a state-supported agricultural insurance development strategy was implemented in Türkiye to reduce the impact of natural disasters on the farm sector and to transfer risk, which TARSİM manages. As of 1 January 2010, the risk of floods has been included in the scope of the state-supported agricultural insurance. Moreover, a successful co-operative example of private and governmental collaboration is compulsory earthquake insurance introduced under the Turkish Natural Catastrophe Insurance Pool (DASK) in Türkiye due to country earthquake features and reduced earthquake risk (Çekici, 2009).

Therefore, considering the examples around the world and Türkiye, it is clear that the Turkish government and private sector cannot be responsible independently for climate-related disasters. A good plan needs the collaboration of the private sector and governmental bodies together. However, before any action, we should consider the legal basis. Afterward, we will analyze the sufficiency of current Turkish legislation regarding climate disasters.

3.2. Climate Change in Turkish Legislation

The issue of climate change in Turkish legislation has gain importance in the last 15 years, and even no mainframe law has been introduced so far, many current provisions of the law are considered in this direction.

To dive into the topic of the work, administrative liability, firstly, the legislations concerned are analyzed. To detect public liability in the destructive effects of climate change in persons and institutions, firstly, the legal qualification of the topic should be made. After defining and qualifying climate change from a legal perspective, it would be easier to detect liability.

3.3. Legal Analysis of Climate Change

Definition of climate change from a legal perspective is vital for detecting the precautions that should be taken, responsible persons and institutions, the conditions for the civil and criminal liability, possible sanctions and rules, and supervision procedures. If climate change is defined only as a part of environmental law, a scientific and technical term, protection of the persons and institutions that get affected by climate change would get more challenging, the legislation concerned would stay unclear and dispersed.

Therefore, due to the analysis and evaluation of Turkish legislation, climate change is qualified as a "disaster," and as a result of such qualification, the State's liability is analyzed.

3.4. The Concept of Disaster in Turkish Legislation

There are different definitions of the concept of disaster in the literature, mainly on similar criteria.

"The incidents which cause physical, economic and social loss, stops or suspends the course of daily life and human activities," "the incidents which rises relatively unexpectedly and suspends the public life," "the incidents which negatively affects the humans, infrastructure, and environment in a large scale," "the incidents which cause intense damage, harm, and destruction.", "The fact that victims of disasters are humans or disasters cause loss of lives marks the concept of disaster as a social fact." "Disaster is called as "disaster" because, as a result, it ruins or suspends human life. Without these factors, as a result, it should not be defined as "disaster" but "natural event," "… [Disasters are the incidents which] is impossible for the society to overcome by its sources, which causes a serious loss on humans and the environment, destroys the social functions severely. [Disaster] arises out of the natural events (fire, flood, earthquake, storm, etc.) or human negligence; it is either the fact or the possibility of the occurrence of either extensive or severe or both extensive and severe damage, disability, loss of life and property."

To have one primary definition of disaster, the most extensive definition accepted by the United Nations is as following all the natural, technological-driven, or human-driven events, which cause a physical, economic, and social loss for humans affects the society by stopping or suspending the daily course of life and overwhelms the local capacity.In the light of the definition made by the United Nations, the definition of disaster in Turkish legislation was searched, but no concrete legal description is found. Instead, to define disaster, concerning pieces of law; different types of disaster, such as earthquake, fire, flood, soil creep, rockfall, snowslide, and settling, are mentioned; thus, the counting method is preferred. However, in the Article 31/b of Law No. 5902 (Law of the Establishment of AFAD) the institution responsible for disaster management, founded in 2009, Defines "disaster" in the legislation. This definition must be entirely comprehensible with the definition made by the United Nations. In the mentioned article, disaster is defined following: "the natural, technological-driven or human-driven events which cause a fully or partially economic and social loss on society and suspend or stop the course of daily life and human activities." (AFAD, 2014). Apparently, the sole definition is not enough to reflect the qualification of the concept. Types of disasters are classified due to their definition in the literature. According to that definition, disaster is defined as natural, technological-driven, or human-driven events. In the literature, although some scientists define the concept of climate change as a disaster, some views consider climate change as a process leading to disasters. Because of the temperature increase, a result of climate change, carbon emission may cause breathing problems; and again, as a result of temperature increase, lack of rainfall causes drought. One reason for disasters such as floods, snowslides, fires, and whirlwinds is climate change. The change in the dates of midseason, increase of the numbers of storms and hurricanes, decrease of water resources due to the increase of the rates in drought and aridity, change in flora, negative impacts on atmospherical activities, glacial melting is disasters caused by climate change.

Natural disasters may increase or decrease climate change, as climate change triggers natural disasters. Therefore, it is possible to consider climate change as a cause and result; it is not wrong to define every incident as a disaster.

After these definitions, all the planning, legislative regulations regarding climate change, detection of institutions and organizations are evaluated under disaster management.

3.5. Administrative Liability

All activities regarding disaster management are public service. Therefore disaster management systems fall under administrative law.

1982 Constitution of Turkish Republic rules that "the acts and operations of Administration shall never be

exempted from judicial review." The legislation clearly states that the administration is responsible for conducting the necessary study, research, control, governance, and supervision regarding disasters. The liability of administration means to compensate the sufferer's loss caused by the administration by transferring some of its asset wealth to the asset to the sufferer. If the administration doesn't pay for the loss by itself, compensation is made through the judiciary. The liability of the administration covers the civil and administrative liabilities of the administration.

3.6. Civil Liability of the Administration

Civil liability is the administration's liability regarding the conflicts that fall under private law and is heard before civil courts. In this scope, the loss is compensated according to private law provisions. Because civil liability falls under private law, it is not included in this work.

3.7. Administrative Liability of the Administration

The administration's liability means compensating the sufferer's loss caused by the administration by transferring some of its asset wealth to the asset to the sufferer. If the administration doesn't compensate for the loss by itself, compensation is made through the judiciary. In administrative law, the administrative liability of administration includes two main titles; these are "fault liability" and "strict liability" In the Constitution (Art. 125), even it is stated that the administration is responsible for its every act and operation; it falls under the responsibility of the judiciary to decide on substantive issues of the liability(Yıldız, 2023).The core of the fault liability is service failure. Service failure is defined as "a gap, defect or malfunction in the foundation, organization or operation of the administration" In Turkish Law, "nonfunctioning," "late functioning," or "malfunctioning" of the service are characterized as service failure. In these cases, the administration is obliged to compensate for the emergent loss.Not functioning of the service occurs when the administration does not act in fields it has the responsibility to act. To hold the administration liable for nonfunction, the administration should be entitled to and responsible for conducting the service concerned. No doubt, the administration cannot hold accountable for the nonfunction of any public service in areas where it does not have the responsibility to perform public service. Service failure occurs, and the administration holds liability from nonfunction in cases where administration holds conditional liability. However, if the administration is granted the power of discretion for conducting a service, an investigation is necessary to decide whether service failure occurs or not. Late functioning points out the service failure when the administration acts extraordinarily slow, and harm occurs due to this late functioning. However, it is not easy to prove that the administration provides service slowly or does not act fast enough. If the duration to provide a specific service is regulated in law, it is easy to detect whether the service is provided late or not. In that case, if the administration extends the period without a legitimate excuse, service failure occurs. But, if there is no provision in the legislation regarding the deadline, the beneficiants shall wait for the administration's action for a reasonable time. If the administration does not provide service in a reasonable time, service failure occurs.

Another subheading of administrative liability is "strict liability." As mentioned above, the main rule is to hold the administration liable for an emerged loss; the administration shall have the fault. In another term, if the administration does not have a weakness, it does not have a liability. However, regarding social, scientific, cultural, etc., transformations, fault doctrine is considered insufficient to compensate for the losses. Parallel to the social, economic, cultural, and scientific developments, the expectations from the state have risen, and with the acceptance of social state doctrine, the amount of the duties of the state has increased. That increase caused the possibility to harm the persons during the conduction of the administrative actions. Therefore, seeking for the administration's fault in every single case may preclude the compensation of the losses of persons. For these reasons, not to violate the rights of persons, the administration can be held liable if the causal link between administrative action and the loss exists; even the administration does not have the fault.

Strict liability can be defined as following: The administration can be responsible for compensating for the loss if the causal link between administrative action and the loss exists; even the administration does not have the fault. Strict liability is a particular type of liability. In administrative law, fault liability, namely service failure, is the basis for liability.

When the loss occurs, firstly, the existence of the service failure shall be investigated. If there is no service failure, then compensation of the loss based on strict liability might be possible. It is not possible to hold the administration liable based on both fault and strict liability. In general, strict liability is based on two main principles; the first one is "danger" or "risk," the second one is "equal apportionment of public burdens."

In the literature, according to the risk doctrine, which is also called risk-liability or harm theory, the administration is liable to compensate for the emerged loss. If the persons get harmed because of the endangering actions or means of the administration, even it does not have the fault. The principle of equal apportionment of public burdens points to the liability of the administration to compensate for the loss of persons who suffers more loss than others, even in cases the administration does not have any fault or perform any dangerous act. The raison d'être of the administration is to maintain public welfare. To keep this, the administration serves in different ways. Many persons benefit from these services. In some cases, services which are for the benefit of society may be harmful. Harmful to the rights of some of the community. In that case, the private loss of persons is compensated according to the

principle of equal apportionment of public burdens. Thus the balance, which had distorted against the persons who suffered the loss, is maintained. It is not possible to compensate for the loss based on both the fault and strict liability. Therefore, considering the course of the incident, the qualification of the loss shall be examined in detail, and the liability of the administration shall be detected whether it is strict liability in cases there is no service failure or not. Compared to fault liability, strict liability is a secondary type of liability." If misconduct causes the loss, fault liability occurs. But if fault liability does not happen but the loss does, and this situation harms the sense of justice, the administration holds strict liability. Because strict liability occurs in exceptional cases, it requires a literal interpretation. That shows that strict liability is a subsidiary type of liability. In administrative law fault liability comes before strict liability. In the scope of strict liability, the sufferer does not have the burden of proof regarding the administration's fault. And even the administration proves that it does not hold the fault, it does not remove the liability from itself. It is enough to confirm that the lien of causality between administrative phenomenon and loss exists. Strict liability is beneficial for the persons because it does not affect "the act of the third party" and "unexpected cases" Even these two elements occur, the administration keeps liability. But, if the "fault of the sufferer" or "force majeure" occurs, the administration does not be liable anymore. In some cases, it is possible for the administration not to hold liable partially or wholly. In other words, the lien of causality between the loss and administrative act may be weakened or disappear because of some cause except administrative actions or operations. In correlation with the removal or weakening of the lien of causality, the responsibility of the administration weakens. The reasons, which may remove or weaken the liability of the administration, are as follows: a force of majeure, unexpected cases, an act of the sufferer, and an act of the third party. The liability of the administration is limited to its technical and financial power. It retrieves the loss in its technical and financial capacity.

3.8. The Liability Regarding Climate Change

As mentioned above, administrative liability is divided into different sections, thus, different procedures and principles. Beyond any doubt, when it comes to administrative liability, fault liability must be sought in the first place. The administration shall be liable for the loss of late functioning, non-functioning, or malfunctioning of the service. In another term, to step out of the liability, the administration shall conduct necessary research, work, controls, supervision, and more importantly, provide educational programs, inform and raise awareness in advance. Regarding climate change, it is not possible to say that the Turkish state conducts such works. Due to the importance of the issue and the high possibility of being affected by climate change, mainly because of the country's location, the state is supposed to complete the works, which will help it eliminate or minimize the occurrence of administrative liability. Likewise, what is shown through scientific data is that Türkiye will come across more destructive effects of climate change more intensely. Therefore it is not easy to guess that in case persons seek the state's liability, the state would be liable in terms of the fault responsibility.

Even the state would take every possible precaution and conduct all technical works based on scientific, legal, research, and development actions; the state would be liable in terms of strict liability because of holding state power. In other words, the state is liable based on climate change because it has a legislative, judiciary, and executive power. This responsibility, which seems to be on the state's side, must be shared with persons by giving them some responsibilities. Because of the state's liability, payment of compensation occurs under a responsibility granted to persons. The state lays the obligation to its citizens in cases of disaster. One of these responsibilities is "to be insured" against the risks of disasters. In that case, the costs of the result of disasters caused by climate change would be paid by the insurance company. If the foreseen danger would take place, the insurer bears the consequences. On the contrary, the person who insures their interest or life pays money (premium). Insurance is not an ordinary commercial activity but an activity with economic and social functions. To function well and obtain its goals, insurance needs to become widespread; to spread insurance, it needs to be believed in. Therefore, the persons and the institutions working in the insurance industry shall be introduced to some rules and controlled by the state regarding the compliance to these rules; the insurance relation must be secured, and the main principles shall be determined (Gürsel, 2018). There is an insurance system for natural disasters in Türkiye, and it is being applied successfully since 2000. In Türkiye, as a country located on the seismic belt, the Law of Disaster Insurance is into force. According to this law, against earthquake, which is one of the disasters, persons are obliged to be insured to compulsory insurance for the earthquake (DASK), and persons who are not insured shall pay compensation and shall not receive any support. In that way, the state created a system that shared its responsibility with the person's responsibility. According to the concerned article, the state's liability ends in case the persons are not insured. Checking the Law of Disaster Insurance, the first article defines the purpose of the code as follows: *"..regulating the procedures and the principles regarding the insurance and reassurance warrants on the compulsory earthquake insurance made to compensate the possible material harms occurred in the buildings in case of earthquake and material and physical harms caused by the disasters and certain risks against which is not possible to be insured or granted warrant by insurance companies.".*

Even the code's title is Law of Disaster Insurance, the third article of the Lode mentions an institution named

Natural Disasters Insurances Authority, which is a legal entity. The Authority, founded under the Ministry in which the Undersecretariat of Treasury is connected, has the responsibility to grant the insurance and reassurance warrants according to the mentioned code. Mentioning the concept of "natural disaster," which is not included by the code's title, is correct and can be taken into account connecting to climate change. Because this Lode aims to regulate the procedures and the principles regarding the insurance and reassurance warrants on the compulsory earthquake insurance made to compensate the possible material harms. occurred in the buildings in case of earthquake and material and physical harms caused by the disasters and certain risks against which is not possible to be insured or granted a warrant by insurance companies. In Article 7/2 on the Code, it is stated that "..If the insurance companies do not grant warrants, in disasters such as earthquake, flood, landslide, hurricane, hail, frost, snowslip, etc.; it is possible to grant insurance or reassurance warrants according to insurance principles". To read the sentences; "material and physical harms caused by the disasters and certain risks against which is not possible to be insured or granted a warrant by insurance companies." and "In case the insurance companies do not grant warrants, in disasters such as earthquake, flood, landslide, hurricane, hail, frost, snowslip, etc." together, even the climate change is not clearly stated, the risks and the concept are parallel to the wording of the articles. Therefore, the most logical system is not creating a new system but using the current and well-working insurance system.

Changing the name of the code from Law of Disaster Insurance to Law of Natural Disaster Insurance and adding the wording "climate change" directly to the code, which the interpretation can already find, would be the more specific solution, and there is no legal hinder against it.

3.9. Model Propositions for Climate Change Insurance

Natural Disasters Insurances Authority, founded by Disaster Law in 2000, is a legal entity responsible for promoting, applying, and directing the Compulsory Earthquake Insurance in Türkiye.

The Compulsory Earthquake Insurance insures the property owners against earthquake risks and the fire, explosion, landslide, and tsunami caused by an earthquake. Regardless of the property's condition, it compensates for the loss and assists the return to everyday life.

DASK aims to promote the Compulsory Earthquake Insurance and spread it countrywide via the insurance companies, its agencies, and cooperating bank branches in cooperation with it and helps people to obtain this assurance with low premiums. DASK insurance gathers different components of the issue and creates an effective and easy procedure.

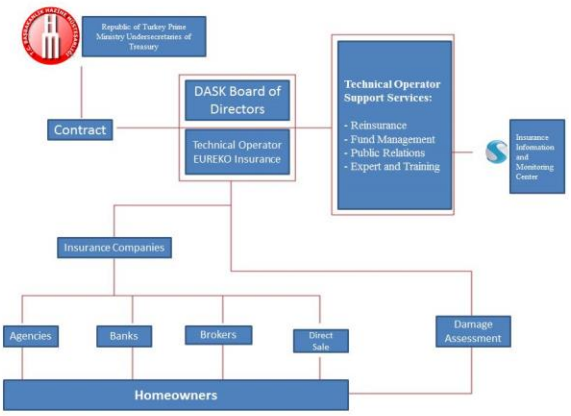

Figure 8. DASK component and procedures.

DASK has one Board of Management and is managed by it. The Board consists of one member from the under secretariat, Ministry of Environment and Urban Planning, Prime Ministry Disaster and Emergency Management Presidency and The Capital Markets Board, minimum on deputy general director level; one member selected among three candidates offered by Union and the Council of Higher Education and one member representing technical operator.

Looking at the Board of management, it can be seen that almost all the actors are involved in the council. Considering that this council would be responsible for climate change, a couple of light touches would cover this responsibility.

The Board of management consists of

A member from the Undersecretariat

A member of the Ministry of Environment and Urban Planning

A member from the Prime Ministry Disaster and Emergency Management Presidency

A member of the Association of the Insurance and Reinsurance Companies of Türkiye

A member of the Council of Higher Education

A member of the Capital Markets Board.

The core of this structure complies with climate change as well. Adding one more member who can inform and analyze, provide necessary information to the Board would be sufficient. Because in the Art. 7 of the Code "… for the earthquake, flood, landslide, hurricane, hail, frost, snowslip, etc.; in case it would be considered as necessary in regard with public welfare.." "for now; for the disaster of climate change, the condition "considered as necessary in regard with public welfare.." should be taken into consideration. Firstly, the wording "considered as necessary regarding public welfare.." shall be removed from the Code. Because every action taken before the existence of the disaster or/and the compensation of the loss caused by the disaster are for the public welfare in their nature, and it would be only time loss for the Board to examine whether such activities are for general interest or not. The actions that fall under the State's responsibility protect public welfare

by their nature, which is the main principle of public law.

Apart from this, the member whom the Council of Higher Education appoints should be appointed regarding the topic. It is necessary and enough to have one member who knows the technical aspect of climate change, or the Board shall be granted authority to appoint. This member can conduct a work; evaluating the cases individually, whether classified as a disaster, through reporting in advance and connecting the topic with climate change by analyzing the scientific information and analysis conducted through years. In that way, keeping the Board's structure, the climate change topic would be included in DASK, and solid progress would be made.

4. Conclusions

Climate change causes physical and economic harm. Because of climate change, carbon emission may cause breathing problems; and again, because of temperature increase, lack of rainfall causes drought. One reason for disasters such as floods, snowslides, fires, and whirlwinds is climate change. Additionally, the difference in the dates of the midseason, an increase of the numbers of storms and hurricanes, decrease of water resources as a result of the rise of the rates in drought and aridity, change in flora, negative impacts on atmospherical activities, glacial melting is disasters caused by climate change. Türkiye is in the climate change zone, and its future is under threat regarding all these negations.

As climate change causes natural disasters, natural disasters trigger or decrease climate change. Therefore, climate change should be qualified as a disaster. All the actions taken for disaster management are public service. Therefore, disaster management services are considered under administrative law, and the state's liability regarding disasters is crucial. The liability, which seems to fall under the state's liability at first glance, shall be shared with people by granting them some responsibilities. Therefore, in these issues, persons are liable, and state responsibility to persons regarding the disaster, and one of these responsibilities is being insured.

Regarding the topic, the legislation in Türkiye is sufficient, and there is an insurance system against natural disasters in Türkiye; and it is operated quite successfully and regularly. In Türkiye, which is on the constant seismic belt, the Code of Disaster Insurance is in force. This Code regulates the procedures and the principles regarding the insurance and reassurance warrants on the compulsory earthquake insurance made to compensate the possible material harms occurred in the buildings in case of earthquake and material and physical damages caused by the disasters and certain risks against which is not possible to be insured or granted a warrant by insurance companies. It should be applied for the disasters out of earthquakes as well; currently, the practice is not sufficient in this aspect. The DASK system is a well-functioning system that divides responsibility equally. It can be practiced for climate change as well. About this topic, information and education should be provided. The scope of the insurance must be broadened and become compulsory as compulsory earthquake insurance.

But in the first phase, a low amount of premium should be demanded, and the state shall handle this responsibility seriously. The burden of the state shall be more comprehensive because of the functioning of the state (in execution, judicial and legislative level), the deficiency in the direction, supervision of the environmental actions, the undeniable effect of the ecocide, the dimensions of the pollution by the economic activities as well as classifying it as a natural disaster.

Unlike the earthquake, climate change is not a field in which the personal liability or the precautions taken at the individual level would work and the state's responsibility, both at the national and international levels, has great importance.

Relevant people should be included in the Insurance Board of Management.

Regarding this topic, Turkish legislation is ready and eligible. There is no hinder to use the current legal and institutional structure for climate change.

Author Contributions

The percentages of the authors' contributions are presented below. All authors reviewed and approved the final version of the manuscript.

	A.A.	N.V.	M.C.G.
C	40	30	30
D	40	30	30
S	40	30	30
DCP	40	30	30
DAI	40	30	30
L	40	30	30
W	40	30	30
CR	40	30	30
SR	40	30	30
PM	40	30	30
FA	40	30	30

C=Concept, D= design, S= supervision, DCP= data collection and/or processing, DAI= data analysis and/or interpretation, L= literature search, W= writing, CR= critical review, SR= submission and revision, PM= project management, FA= funding acquisition.

Conflict of Interest

The authors declared that there is no conflict of interest.

Ethical Consideration

Ethics committee approval was not required for this study because of there was no study on animals or humans.

References

Acar O. 2006. Gelişmiş ülkelerin sigorta sektöründe doğal afet risklerinin finansmanı ve katastrofik tahviller: 2005 Yılı Analizi. Sigorta Araş Derg, 2: 107-121.

AFAD 2014. 2014-2023 İklim değişikliği ve buna bağlı afetlere yönelik yol haritası belgesi. URL: https://www.afad.gov.tr/kurumlar/afad.gov.tr/3920/xfiles/iklim-son.pdf (accessed date: December 26, 2023).

Alcamo J, Moreno J, Nováky M, Bindi B, Corobov M. 2022. Devoy acarnational climate assessment. J Global Change, 7: 11-42

Çekici, E. 2009. Küresel ısınma ve iklim değişikliğinin Türkiye'de tarım sigortalarina etkisi. Öneri Derg, 8(32):105-111.

Dogan S, Doğan E, Tüzer, M. 2020. Küresel ısınma ve iklim değişikliği: Bilimsel uzlaşmadan politik ayrışmaya. İstanbul Ticaret Ünivi Sosyal Bilim Derg, 19(39):1453-1484.

Finneran A, O'Sullivan L. 2010. The effects of force and exertion duration on duty cycle time: implications for productivity. J Human Factors Ergon Manufact, 20(4): 324-334

Golnaraghi M, 2018. Addressing climate change belongs in insurance companies' boardrooms, J Risk Manage, 41: 24-30

Gürsel, E. 2018. İdarenin doğal afetler neticesinde meydana gelen zararlardan sorumluluğu. J Res Stud Anatolia, 1(2): 330-343.

Hallegatte, Stephane and Bangalore, Mook and Bonzanigo, Laura and Fay, Marianne and Narloch, Ulf and Rozenberg, Julie and Vogt-Schilb, Adrien, 2014. Climate Change and Poverty. J Analytl Framework 7126: 1-47

Hsiang SM, Burke M, Miguel E. 2013. Quantifying the influence of climate on human conflict, J Sci, 341: 6151

Madeleine CT, Delia G, Ruth D, Jessica C, Metcalf E, Hannah N, Alessandra G. 2018. Climate impacts on disasters, infectious diseases and nutrition. London, UK, 1st ed., pp: 26.

Röder M, Thornley P , Jamieson C. 2024. The greenhouse gas performance and climate change mitigation potential from rice straw biogas as a pathway to the UN sustainable development goals, J Biomass Bioen, 182: 1-15

Şen ÖL. 2013. A holistic view of climate change and its impacts in Turkey. (Report). Istanbul Policy Centre, Istanbul, Sabanci University, Istanbul, Türkiye, pp: 124.

Surminski S, Bouwer LM, Linnerooth-Bayer J. 2016. How insurance can support climate resilience. J Nature Climate Change, 6(4): 333-334.

Türkeş M, Deniz AZ. 2010. Klimatolojik/meteorolojik ve hidrolojik afetler ve sigortacılık sektörü. Uluslararası İnsan Bilim Derg, 7(2): 997-1020.

Yıldız AŞ. 2023. Depremden kaynaklanan manevi zararlardan idarenin sorumluluğu. Türkiye Barolar Birliği Derg, 167:133-175.