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Agriculture in Türkiye's 2024–2030 Climate Change Policies: Ecological Modernization or Ecological Transformation?

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Abstract

The self-reinforcing feedback between climate change and agricultural production is deepening the crisis in both areas. Climate change directly affects agricultural production and increases sectoral vulnerabilities. Conversely, when agricultural production is not carried out under appropriate conditions and methods, it further exacerbates climate change. The global food system, responsible for about one-third of global emissions due to high levels of carbon and methane, is a major source of climate change. Türkiye is among the countries that most distinctly experience the impacts of climate change on the agricultural sector, owing to its physical and structural conditions. The increasing frequency of droughts, declining groundwater levels, heavy rainfall, late frosts, floods, and forest fires exert serious pressure on agricultural production, posing a significant threat to food security in Türkiye. Therefore, for Türkiye, policies and strategies developed by taking into account the intricate relationship between climate change and the agricultural sector and envisioning structural transformations in agriculture consistent with climate change mitigation and adaptation objectives, are of critical importance. In this context, the study aims to examine what kind of transformation Türkiye's climate policy envisions for the agricultural sector in terms of food security, and whether this transformation is based on ecological modernization or ecological transformation. For this purpose, the strategy and action plans that shape Türkiye's climate policy are subjected to content analysis using MAXQDA24 Analytics Pro, and the findings are discussed from a critical perspective.

Keywords: Climate change, agriculture, adaptation, mitigation, food security.

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Türkiye'nin 2024–2030 İklim Değişikliği Politikalarında Tarım: Ekolojik Modernizasyon mu, Ekolojik Dönüşüm mü?

Öz

İklim değişikliği ile tarımsal üretim arasındaki kendini pekiştiren geri besleme ilişkisi, her iki alandaki krizi giderek derinleştirmektedir. İklim değişikliği, tarımsal üretimi doğrudan etkilemekte ve sektörle bütünleşen kırılganlıkları artırmaktadır. Diğer taraftan tarımsal üretim uygun koşul ve tarzda yapılmadığında iklim değişikliğini daha da şiddetlendirmektedir. Küresel gıda sistemi, yüksek karbon ve metan gazı salımı nedeniyle küresel emisyonların yaklaşık üçte birinden sorumlu olup iklim değişikliğinin başlıca kaynaklarından birini oluşturmaktadır. Türkiye, fiziki ve yapısal koşulları nedeniyle iklim değişikliğinin tarım sektörü üzerindeki etkilerini en belirgin şekilde yaşayan ülkeler arasında yer almaktadır. Kuraklıkların sıklığının artması, yeraltı su seviyelerinin düşmesi, aşırı yağışlar, geç donlar, seller ve orman yangınları tarımsal üretime ciddi baskı uygulayarak Türkiye'de gıda güvenliği için önemli bir tehdit oluşturmaktadır. Bu nedenle, Türkiye için, iklim değişikliği ile tarım sektörü arasındaki karmaşık ilişkiyi dikkate alan ve iklim değişikliğinin azaltılması ve uyum sağlanması hedefleriyle tutarlı yapısal dönüşümleri öngören politikalar ve stratejiler kritik önem taşımaktadır. Bu bağlamda, çalışma, Türkiye'nin iklim politikasının gıda güvenliği açısından tarım sektörü için ne tür bir dönüşüm öngördüğünü ve bu dönüşümün ekolojik modernleşmeye mi yoksa ekolojik dönüşüme mi dayandığını incelemeyi amaçlamaktadır. Bu amaçla, Türkiye'nin iklim politikasını şekillendiren strateji ve eylem planları MAXQDA24 Analytics Pro kullanılarak içerik analizine tabi tutulmuş ve bulgular eleştirel bir bakış açısıyla tartışılmıştır.

Anahtar Kelimeler: İklim değişikliği, tarım, uyum, azaltım, gıda güvenliği.

1. Introduction

The global food system, with high carbon and methane emissions, accounts for one-third of global emissions. Thus, it is one of the main drivers of the climate crisis. On the other hand, the food system encompasses sectors that are among the most affected by the climate crisis, both now and in the future. Current food policies give rise to a food system that lacks resilience in the face of crises. (Elver & Güneş, 2023). According to the Food and Agriculture Organization (FAO), over the past thirty years, disasters and extreme weather events have caused \$3.8 trillion in losses in global agricultural production (Food and Agriculture Organization [FAO], 2023a). Climate change, by increasing the frequency and intensity of extreme weather events, negatively affects crop and livestock production; this, in the long run, undermines hard-earned development gains and the livelihoods of producers (Food and Agriculture Organization [FAO], 2023b). In addition, climate change affects producers' working conditions and periods.

Due to its dependence on climate and environmental variables, agricultural production carries an inherent or structural risk. Climate change has driven these natural risks beyond manageable limits, making agricultural production vulnerable to extreme weather events. When agricultural practices incompatible with the ecosystem are added to these conditions, the issue of unmanageability becomes a multidimensional crisis. Unsustainable tillage practices, improper application of fertilizers and pesticides, inappropriate land use, and water mismanagement are just a few of the ecosystem-incompatible practices. This self-reinforcing cycle deepens food insecurity a situation defined as restricting people's access to sufficient, nutritious, and safe food for a healthy and active life (World Food Programme [WFP], 2025). This process negatively affects food supply and quality and increases societal inequalities in access to quality and culturally appropriate foods.

Türkiye's location in the Mediterranean basin increases its vulnerability to climate change. IPCC reports (2023) highlight significant climate risks threatening the Mediterranean basin.

These risks include reduced agricultural productivity, severe drought, forest fires, extreme temperature increases, water scarcity, sea-level rise, ecosystem and biodiversity degradation, and severe risks to human health. These risks put serious pressure on agricultural production. At the same time, the agricultural sector in Türkiye accounts for about 13% of total greenhouse gas emissions. Among all sectors, agriculture has the largest share of nitrous oxide (N₂O) and methane (CH₄) emissions (İstanbul Policy Center [IPC], 2025). Therefore, for Türkiye, policies and strategies that anticipate structural transformations in the agricultural sector, in line with climate change mitigation and adaptation targets and considering this intricate relationship, are of critical importance.

In the literature, the relationship between climate change and agriculture is generally addressed within the context of food security. As a political discourse, food security is defined by FAO as “a situation in which all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (Food and Agriculture Organization [FAO], 2001). Although the definition emphasizes access, the concept of food security has over time become a discourse dominated by production-oriented policies. However, the persistence of hunger and malnutrition despite increasing production has shown that the issue is related to distribution and sharing—that is, the right to food (Adaman & Akkoç, 2023).

The use of the food security concept in policy documents has significant political consequences. Accordingly, to ensure food security, climate change adaptation policies must be designed to achieve three objectives: increase agricultural productivity, make agriculture more resilient to climate change, and reduce global greenhouse gas emissions from agriculture. To this end, actors support the use of production methods such as digital agriculture, smart agriculture, precision agriculture, sustainable intensification in agriculture, or climate-smart agriculture (World Bank, 2015).

Scholars within critical theory, particularly political ecologists, argue that climate change adaptation and mitigation policies in agriculture pave the way for the creation of a new field of capital accumulation for technology companies and shape a new phase of the modernization vision in agriculture (Adaman et al., 2020). Unlike critical social scientists, ecological modernization theorists attribute a critical role to technology, science, and the state in solving environmental problems (Gibbs, 2000). According to this theory, while industrialization and modernization are recognized as the root causes of this century's environmental problems, their resolution is paradoxically seen as attainable only through deeper modernization and 'super' industrialization (Buttel, 2000).

This article questions whether the concept of food security in the documents shaping Türkiye's climate policy is addressed from a rights-based understanding focused on access to food or from an ecological modernization perspective based on technological development and capital accumulation. Thus, the theoretical counterpart of the vision adopted by these documents for agricultural policies will be revealed. In this way, the study aims to systematically evaluate the relationship between the transformation envisaged in Türkiye's climate change policies and agricultural policies from a critical perspective.

Content analyses of nationally formulated strategy documents and action plans remain limited. Moreover, the question of what kind of transformation climate policies envision for the agricultural sector remains a largely underexplored area in the literature. The study contributes to both fields by conducting a content analysis of two recent policy documents—the Climate Change Adaptation Strategy and Action Plan (2024–2030) (hereinafter referred to as the “Adaptation Document”) and the Climate Change Mitigation Strategy and Action Plan (2024–2030) (hereinafter referred to as the “Mitigation Document”)—with a focus on their provisions for the agricultural sector.

The MAXQDA24 Analytics Pro software, a computer-assisted qualitative data analysis program, was used for the content analysis, through which the goals, policy instruments, strategies, and discursive frameworks embedded in the documents were systematically coded and analyzed. By bringing a methodologically rigorous approach to an underexplored subject, the study aims to make a meaningful contribution to the existing literature.

The systematic analysis of the documents reveals which themes the policies prioritize and how strategic objectives are linked to action plans. In this respect, the article makes the strengths and weaknesses of existing policies more apparent. The study provides not only an academic contribution but also offers policymakers and civil society organizations a relevant dataset and foresight in the field. The study focuses on the question: “What kind of transformation is envisioned for agriculture within the scope of Türkiye’s 2024–2030 Climate Change Mitigation and Adaptation Policy Strategies and Action Plans?” In connection with this research question, the following sub-questions are addressed:

- How is the interaction between agriculture and climate change framed and problematized in the Adaptation Document and the Mitigation Document, and what factors are foregrounded as the primary determinants of this relationship?
- What underlying dynamics shape the solutions proposed for agricultural policies in the relevant documents?
- Through which institutional coordination and participation mechanisms will the implementation of the proposed agricultural policy solutions?
- How does the presence or absence of the concepts of 'Right to Food' and 'Food Security' shape the overarching policy vision of the documents and the transformation envisioned for the agricultural sector?

The article consists of four sections. The first section, Material and Method, details the research design, documents to be analyzed the analytical framework, and the coding process. In the second section, the theoretical foundations of thematic analysis are briefly explained. The third section presents the findings of the content analysis, organized around three main themes and five key findings. In the discussion section, the findings are situated within the relevant theoretical literature and discussed within a broader framework. In the conclusion, the study’s contributions, limitations, and recommendations for future research are presented.

1.1. Research Design

To analyze Türkiye's climate policies from the agricultural sector's perspective, the Adaptation Document and the Mitigation Document were subjected to content analysis. These documents were selected because they are national policy documents, are up to date and forward-looking, and cover a period in which critical, concrete steps are expected for Türkiye's international climate commitments and 2050 net-zero target following the ratification of the Paris Agreement.

The qualitative method adopted in the study—content analysis—is used to systematically describe and interpret the meaning of qualitative material (Schreier, 2012). According to Krippendorff (2004), content analysis is a research technique for making replicable and valid inferences from texts and other meaningful material to the contexts of their use. Content analysis is especially useful for revealing meanings, prejudices, patterns, and overarching themes that are not directly expressed or noticed on a superficial review of a text. Additionally, this method allows for the examination of large texts through sampling and scaling with multiple coders, thereby facilitating the analysis of voluminous texts. (Neuman, 2014). For content analysis in this article, the MAXQDA24 Analytics Pro software was used.

1.2. Data and Documents

1.2.1. Climate Change Adaptation Strategy and Action Plan (2024–2030)

The Adaptation Document contains content and structural differences compared to the previous strategy document covering the 2011–2023 period. Table 1 presents a comparative overview of the headings in the two most recent strategy documents.

Table 1

Comparison of Headings in Türkiye's Climate Change Adaptation Strategy and Action Plan Documents (2011–2023 / 2024–2030).

2011–2023 Strategy Document Titles	2024–2030 Strategy Document Titles	Status of Change
Agriculture Sector and Food Security	Agriculture and Food Security	Conceptual Update
Human Health	Public Health	Conceptual Update
Natural Disaster Risk Management	Disaster Risk Reduction	Conceptual Update
Ecosystem Services, Biodiversity and Forestry	Biodiversity and Ecosystem Services	Reorganization
Water Resources Management	Water Resources Management	Continued Title
Cross-Cutting Issues	Cross-Cutting Issues	Continued Title
–	Urban	Newly Added
–	Energy	Newly Added
–	Industry	Newly Added
–	Transport and Communication	Newly Added
–	Tourism and Cultural Heritage	Newly Added
–	Social Development	Newly Added

The addition of new topics and the updating of existing ones can be interpreted not only as an expansion of the scope of climate change adaptation policies but also as an indicator of changes in Türkiye's vision for climate change adaptation.

Between the publication dates of the two documents, Türkiye's climate change policies underwent significant developments. During that period, Türkiye ratified the Paris Agreement (October 7, 2021), submitted its Updated First Nationally Determined Contribution (NDC) in 2023, and included adaptation as a separate heading. In addition, the 2053 Net Zero Emission Target was announced. In 2022, Türkiye held its first Climate Council, and in 2024, the 12th Development Plan, which includes the heading "Protection of the Environment," was prepared. Taken together, these developments indicate that the Adaptation Document was developed in parallel with Türkiye's international commitments and national policy priorities.

Unlike the previous period, the 2024–2030 Strategy Document and Action Plan include risk maps and impact chain tables that address hazard, exposure, vulnerability, and risk dimensions. Future climate hazards were analyzed using regional climate projections, and vulnerability and risk analyses were conducted using an international risk analysis methodology. The data were shared at consultation meetings attended by relevant private, public, academic, and civil society organizations, and national vulnerability and risk analyses were determined (T.C. Çevre, Şehircilik ve İklim Değişikliği Bakanlığı, 2024). In this form, the document is based on vulnerability analysis.

The document comprises 12 sections, 40 strategic objectives, and 132 actions, covering topics ranging from industry and cities to energy, tourism, and cultural heritage. In this context, agriculture is defined as a "strategic sector because it is the main sector producing food. Therefore, agriculture is an area that must be sustained economically, socially, and environmentally, especially to ensure the country's food security and safety" (T.C. Çevre, Şehircilik ve İklim Değişikliği Bakanlığı, 2024). Under the heading "Agriculture and Food Security," there are three main strategic objectives and 12 actions. The strategies are:

- Developing policy and legal frameworks to support the agriculture sector's adaptation to climate change; enhancing institutional capacity, cooperation, and awareness.
- Protecting, enhancing, and promoting the sustainable use of ecosystems and natural resources in agricultural production.
- Expanding R&D activities on climate change impacts and adaptation in agriculture; developing databases, information technologies, and innovation solutions to guide agricultural activities.

1.2.2. Climate Change Mitigation Strategy and Action Plan (2024–2030)

This document is the first to be prepared separately for mitigation policies. Previously, strategic targets and action plans for mitigation were included in the Climate Change Action Plan 2011–2023. In 2021, Türkiye became a party to the Paris Agreement and announced its goal of achieving net-zero greenhouse gas emissions by 2053. In 2023, to support its Nationally Determined Contribution (NDC), Türkiye released its own Mitigation Strategy and Action Plan.

Within the Mitigation Document, agriculture is one of seven main mitigation sectors. The others are industry, buildings, energy, transportation, waste, and AKAKDO (land use, land-use change, and forestry). In addition, there are separate sections on “just transition and carbon pricing mechanisms.” Under the agriculture heading, there are 7 strategies and 27 actions (T.C. Çevre, Şehircilik ve İklim Değişikliği Bakanlığı, 2024). The strategies are:

- Reducing methane emissions from livestock breeding
- Increasing efficiency in using chemical fertilisers
- Reducing the use of pesticides and antimicrobials
- Developing loss, waste and residue management in agricultural production
- Increasing efficiency of land and soil management
- Providing farmers with access to affordable financing
- Promoting training, awareness-raising and capacity-building activities for stakeholders operating in agriculture sector considering gender balance

The strategies outline the steps to be taken across various areas at the sectoral level, including legislation, technical infrastructure, technology, finance, capacity building, education, and social awareness. For each action specified in these strategies, distinct monitoring indicators and responsible institutions have been identified.

1.3. Analytical Framework

In content analysis, code is an analysis unit that categorizes text fragments sharing a meaning or quality relevant to the research question and aim of the article. A sub-code is a more detailed, lower-level category within the same analytical framework. Themes are higher-level analytical categories encompassing related codes. The combination of these text fragments sharing the same meaning and quality is expressed throughout the whole text as weights, percentages, and intensities. Based on these intensities, findings about the content of the text are obtained. The percentages beside the codes indicate their proportional weight within the total coded content in the relevant documents. For example, the phrase “providing training to farmers...” in the documents is coded as “Education and Capacity Building”, a sub-code under “Agricultural Modernization”. Likewise, infrastructure development is coded under the infrastructure sub-code of “Agricultural Modernization. By comparing the weights and percentages of these two examples, the analysis of the text is carried out. These data obtained with MAXQDA are visualized with the Code Matrix Browser. The documents are also analyzed using the Code Relations Browser, which shows the proximity between two codes within the text.

The Adaptation Document and the Mitigation Document were uploaded to the MAXQDA 24 Analytics Pro program for analysis. The program was used to systematically manage the data. During the data analysis process, the documents were examined and coded at the sentence and paragraph levels. The analysis of the documents, categorized and themed based on the codes identified, utilized the program’s Code Matrix Browser and Code Relations Browser for data visualization

The themes used for document analysis were developed on the basis of the two theoretical frameworks underlying the article — ecological modernization and critical theory. These are: Theme-0 Discursive Foundations and Policy Framework, Theme-1 Ecological Modernization, and Theme-2 Critical Approach.

THEME-0: Discursive Foundations and Policy Framework was developed to examine how the two documents frame the relationship between agriculture and climate change, to identify which causes are foregrounded and which are rendered invisible, and to understand what discursive tools are employed to legitimize the proposed interventions. To this end, two main codes were established: "Definition of the Problem" and "Legitimation Strategies".

Definition of the Problem captures how the documents frame the causes and scope of the issue, and in turn shapes the policies developed as solutions. In this study, Definition of the Problem was examined through three codes: "Causality of the Problem", "Effects of Climate Change on Agriculture", and "Effects of Agriculture on Climate Change" (see Table 2). The distribution of codes in the two documents shows how each document defines the problem and which causes are emphasized or rendered invisible.

"Legitimacy Strategies" show the foundations on which the necessity and reliability of the relevant policy document are built. In this study, "Legitimacy Strategies" were examined through sub-codes such as "Food Security", "International Alignment", and "Urgency" (see Table 2).

Table 2

THEME-0 Discursive Foundations and Policy Framework Codes and Sub-Codes

Code	Sub-Code	Sub-Sub-Code
Legitimacy Strategies	Common but Differentiated Responsibilities.	
	Knowledge Gap / Data Deficiency.	
	Global Impact / Being Globally Affected.	
	Scientific Authority	
	Urgency	
	International Alignment	
	Green Transition	
	Food Security	
Problem Definition		Naturalization
		An Inevitable External Force
		Structural Reason
		Individual Reasons
		Abstract / Widespread Reasons
		Power Imbalances
		Industrial Agriculture Model
	Causality of the Problem	
	Effects of Agriculture on Climate Change	
	Effects of Climate Change on Agriculture	

THEME 1 (Ecological Modernization) and THEME 2 (Critical Approach) share three main codes: "Solution Framework", "Value Orientations", and "Governance Architecture". In the study, the "Solution Framework" encompasses the solutions developed to address problems affecting climate change and agriculture. "Value Orientations" explain why these solutions are pursued and which values are prioritized. "Governance Architecture" examines the institutional structure of actors established to implement these solutions and values. This coding also analyzes which actors are emphasized or rendered invisible in policies and how institutional coordination is established.

The codes and sub-codes for Theme-1 and Theme-2 are presented in Table 3.

Table 3

THEME-1 Ecological Modernization Codes and Sub-Codes and TEMA-2 Critical Approach Codes and Sub-Codes

			Code	Sub-Codes	Sub-Sub-Codes
THEME-1 Ecological Modernization Codes and Sub-Codes	Solution Framework	Marketization/Market-Oriented Agriculture			Financialization of Agricultural Risk
		Agricultural Modernization			Modern (Explicit) Standardization Planning Education, Awareness and Capacity Building Development Rationalization Technification Infrastructure
	Value Orientations	Digital and Technological Solutionism			Digitalization Artificial Intelligence
		National Circumstances / Developing Country Status Economic Loss Development Discourse			—
	Governance Architecture	Economic Producer Rationality			Competitiveness Discourse Production Orientation Efficiency Logic
		Expert-Oriented Governance Monitoring, Reporting and Verification (MRV) State-Centered Coordination Stakeholder Participation / Governance			

THEME-2 Critical Approach Codes and Sub-Codes

Code	Sub-Codes	Sub-Sub-Codes
Solution Framework	Alternative Food Systems	Urban Agriculture Practices
	Protection, Access and Distribution of Resources	Access to Means of Production
		Regional and Local Distribution
		Protection of Commons and Resources
	Agroecological Transformation	Reduction and Deceleration of Consumption
		Ecological Agriculture Practices
		Local and Traditional Knowledge
Education and Capacity Building	Farmer Training	
	Training for Women	
	Training for Vulnerable Groups	
Social Protection and Security	–	
Value Orientations	Position and Importance of Farmers and Producers	Visibility of Local Communities
		Farmer Well-being
		Smallholders / Family Labor
		Farmer Health
	Social and Economic Justice	Fair Distribution
		Social and Economic Protection Networks
		Global North–South
		Climate Justice (Just Transition; Just Adaptation)
Right to Food and Food Sovereignty	Livelihood Security	
	Food Sovereignty	
	Right to Access Food	
Intersectional Justice	Gender Dimensions	
	Visibility of Disadvantaged Groups	
Ecological and Intergenerational Justice	Climate-Oriented Approach	
	Intergenerational Justice	
	Animal and Plant Rights	
	Rights of Nature	
Governance Architecture	Accountability	
	Transparency	
	Horizontal Knowledge Sharing	
	Agricultural Cooperatives, Producer and Producer Organizations	

2. Theoretical Foundations of Thematic Analysis

Ecological modernization theory is one of the sociological theories that aims to explain and interpret how modern industrial societies can cope with environmental crises. The theory focuses on environmental deterioration, institutional developments, and social practices transformed through reforms (Mol, 2000). Ecological modernization can be understood from two perspectives: as a theory of social change and as a policy strategy. The first aims to transform modern industrial society into an ecologically conscious society. The second assumes that flexible, market-based enterprises will voluntarily participate because they believe they can make a profit while protecting the environment. This approach, emphasizing a win-win relationship between environmental protection and economic growth, also advocates environmental protection as a means of economic development. Since the 1990s, the policy strategy approach of ecological modernization has drawn the attention of the international community and national governments. The main reason for this is its optimistic assumption that environmental degradation can be stopped without radically changing the structure of modern industrial society (Sezgin, 2012).

Ecological modernization theorists (especially Spaargaren and Mol) see technological innovation as a crucial determinant in solving environmental problems (Fisher & Freudenburg, 2001). Solutions to problems parallel the development of technology. It is economically and politically feasible to produce with clean, environmentally friendly technologies.

Ecological modernization theory also attributes an important role to public authority. It is assumed that policies proposed by ecological modernization—such as the adoption of clean energy and technologies by market actors and society—can be implemented through regulations issued by public authority (Durgun & Koçal, 2025). Although the approach assigns significant responsibilities to market actors, it argues that the main carrier of transformation should be the state. However, rather than strengthening a central authority, this approach emphasizes increasing the state's capacity. In addition, it recognizes the transnational nature of environmental problems and highlights the necessity of supranational approaches for their solution (Spaargaren, 2000).

Ecological modernization is an approach that emphasizes the need for further modernization of existing systems (economy, technology, and institutions) to solve environmental crises. However, the idea of solving the ecological crisis through further modernization or digital solutionism has been criticized. Foster, Clark, and York (2010) argue that ecological problems cannot be solved solely with technological and market tools. They explain this briefly with two concepts: the Midas Effect and the Jevons Paradox. The Jevons Paradox holds that improvements in efficiency can actually increase the use of natural resources in a capitalist system, so policies based on technological solutions reduce ecological sustainability. The Midas Effect is the constant tendency of the market to turn ecological values into economic ones and to commodify nature. Therefore, the underlying modernization, marketization, and technological solutionism of ecological modernization further deepen the problem.

The critical approach addresses the important role that ecological modernization attributes to the state and institutions differently. James C. Scott's (2022) concept of high-modernist

agriculture and the notion of “legible agriculture” are relevant here. High-modernist agriculture involves capital-intensive, scientifically managed, standardized models that grow machine-friendly crops, in contrast to complex local practices. Scott emphasizes that the state's ability to simplify and make agriculture “legible” enables direct intervention and control over real farmers and real fields. This approach involves developing infrastructure, calculation, and technicalization.

This study's critical approach focuses on three concepts: food security, the right to food, and food sovereignty. The definitions for these concepts were provided in the introduction, but Elver & Güneş (2023)'s detailed explanation is used for sub-coding in thematic analysis. Food security prioritizes production over access and treats food as a policy object to be managed on the supply side. In contrast, the right to food focuses on individuals' social and economic rights. Recently, efforts have been made to integrate both concepts (Elver & Güneş, 2023). Food sovereignty, on the other hand, defines the food system from producers' perspectives and spans all stages from seed to table. It is grounded in social equality and agroecological knowledge rather than being governed as a commodity by the global free market. Practical goals of food sovereignty include protecting communal assets such as pastures and farmland, expanding agroecological production methods, and disseminating the knowledge inherent in peasant and farmer practices (Elver & Güneş, 2023).

The two theoretical frameworks summarized above provide the analytical lens for interpreting the findings and discussion sections of this study. The themes, codes, and sub-codes developed from these frameworks are detailed in the findings below.

3. Findings

The findings are organized around three themes developed in line with the study's research questions and theoretical framework. Theme 0 (Discursive Foundations and Policy Framework) is addressed separately given its distinct analytical focus. The findings for Theme 1 (Ecological Modernization) and Theme 2 (Critical Approach) are presented comparatively, first for the Adaptation Document and then for the Mitigation Document. Five main findings are presented at the end of the section.

3.1. Theme 0 – Discursive Foundations and Policy Framework Findings

Theme 0 examines how the relationship between climate change and agriculture is problematized which causes are emphasized or rendered invisible, and the main grounds of legitimacy. These findings aim to answer the study's first sub-question.

The distribution of the “Legitimacy Strategies” and “Problem Definition” codes and their sub-codes (see Table 2) across both documents was examined, and the findings are presented below.

According to the Code Matrix Browser results, the Adaptation Document grounds the legitimacy of its policies primarily in “Scientific Authority”, “International Alignment”, and identified gaps in knowledge and data. This suggests that agricultural policies are framed as

responses justified by reference to scientific reports and international commitments rather than by domestic needs or rights-based considerations.

"Food security" is treated as a relatively weak legitimizing tool in the Adaptation Document. Additionally, the Code Relations Browser was used in the Adaptation Document to examine how the "Food Security" code intersects with THEME-1 and THEME-2 "Value Orientations" codes. Conceptually, the document frames food security through the lens of production, productivity, and economic rationality. For example: "A reduction in the production of agricultural and food products will not only endanger food security but also result in price increases" (Adaptation Document, 2024, p. 262).

In the Adaptation Document, the "Effects of Climate Change on Agriculture" sub-code is highly prominent. "The Problem Causality" and "Agriculture's Impact on Climate Change" codes appear at much lower rates. Upon closer examination, among the sub-codes of "Problem Causality", "Abstract/General Causes" are addressed more intensively. This structure indicates that the reciprocal relationship between climate change and agriculture is weakly developed in the document.

According to the Code Matrix Browser results for the Mitigation Document, there is a significant gap between the two main codes: "Legitimacy Strategies" and "Problem Definition". "Legitimacy Strategies" account for 75% of the coded content under this theme, while "Problem Definition" accounts for the remaining 25%. The dominance of "Legitimacy Strategies" in the text indicates that the document focuses more on justifying the policies than on defining the problem.

Another important finding for the Mitigation Document is that there are no indicators of the "Effects of Climate Change on Agriculture" in the "Problem Definition" code. Furthermore, agriculture's impact on climate change is explained solely in terms of emissions. As a result, the solutions are shaped accordingly. Compared with the Adaptation Document, the Mitigation Document, in the sub-codes of Problem Causality, includes indicators related to "Power Imbalances", "Structural Causes", and the "Notion of an Unavoidable External Force". This suggests a deeper, more critical approach to the problem's causes in the Mitigation Document.

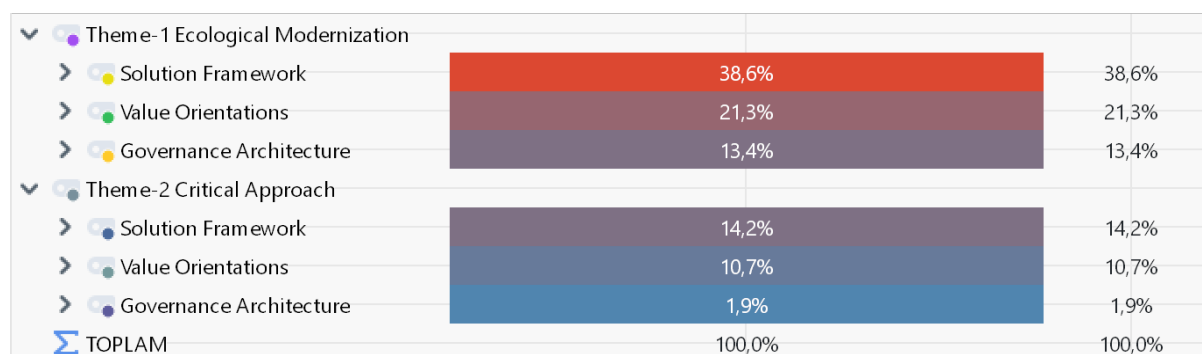
3.2. Findings for Theme 1 (Ecological Modernization) and Theme 2 (Critical Approach): Climate Change Adaptation Strategy and Action Plan 2024–2030

This section examines the Adaptation Document from the perspectives of Theme 1 and Theme 2. The findings for the "Solution Framework", "Value Orientations", and "Governance Architecture" codes and sub-codes are presented together, enabling a comparison of the relative weight of each approach in the document.

In the Adaptation document, the indicators for Theme 1 (Ecological Modernization) are more prominent than those for Theme 2 (Critical Approach).

Figure 1

Climate Change Adaptation Strategy and Action Plan 2024-2030 Document THEME-1 and THEME-2 Findings.



When comparing the “Solution Frameworks” of Theme 1 and Theme 2 in the Adaptation document, Ecological Modernization emerges as the dominant approach. Within the “Solution Framework” of Theme 1, there is a focus on “Agricultural Modernization” and “Marketization/Market-Oriented Agriculture” sub-codes. The presence of “Digital and Technological Solutionism”, as well as “Education, Awareness, and Capacity Building”, indicates that the “Solution Framework” in adaptation policies is based on a reformist approach that aims for modernization through technological efficiency and knowledge transfer, while maintaining market structures.

Within the Critical Approach, the “Solution Framework” in the Adaptation document is most focused on the “Agricultural Ecological Transformation” code. This focus results from the document’s emphasis on “Ecological Agriculture Practices”. The solution framework for the Critical Approach is thus addressed through agricultural ecological transformation practices.

Regarding “Value Orientations”, Theme 1 again dominates the Adaptation document, though Theme 2 is not entirely absent. “Economic Producer Rationality” is dominant in Theme 1, primarily due to the documents’ production-oriented focus. In Theme 2, “Ecological and Intergenerational Justice” appears strongly, while the “Right to Food and Food Sovereignty” have only a marginal presence.

“Governance Architecture” is the least represented code across both themes in this document, though Theme 1 has a greater share. “Governance Architecture” for Theme 1 is largely centered on governance. For Theme 2, there is no evidence of “Horizontal Knowledge” sharing. “Agricultural Credit Cooperatives, Producers, Producer Organizations”, “Accountability”, and “Transparency” are present only at a very limited level. While producers are recognized as actors within the “Value Orientation” codes, they are given only a very limited role in the “Governance Architecture”.

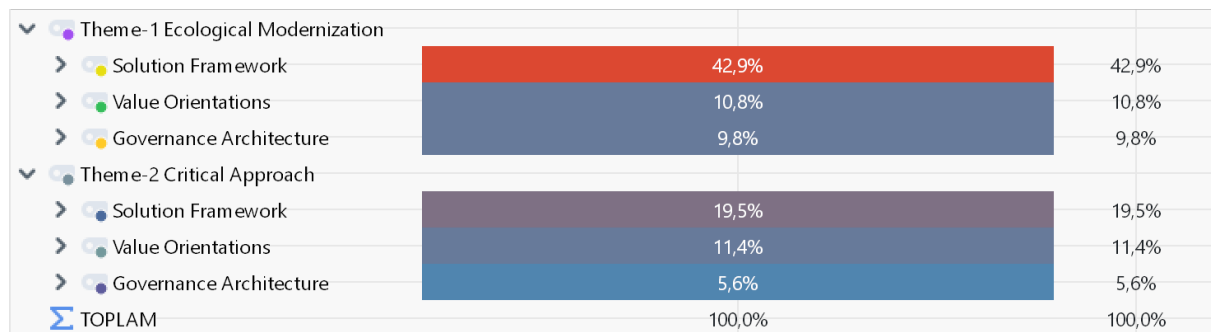
3.3. Findings for Theme 1 (Ecological Modernization) and Theme 2 (Critical Approach): Climate Change Mitigation Strategy and Action Plan 2024–2030

This section examines the Mitigation Document using the same analytical framework. The “Solution Framework”, “Value Orientations”, and “Governance Architecture” codes and sub-codes are presented together to show the relative prominence of each approach in the document.

According to the Code Matrix Browser results for the Mitigation Document, the indicators for Theme 1 (Ecological Modernization) are again more prominent than those for Theme 2 (Critical Approach).

Figure 2

Climate Change Mitigation Strategy and Action Plan 2024-2030 Document THEME-1 and THEME-2 Findings



Within the “Solution Frameworks”, Theme 1 dominates. “Agricultural Modernization” remains a prominent sub-code, and the sub-codes of “Education, Awareness, Capacity Building”, and “Technicalization” outline the path for “Agricultural Modernization”. Unlike the Adaptation Document, the Mitigation Document also includes the sub-codes of “Digitalization and Artificial Intelligence” under “Digital and Technological Solutionism”, indicating the emerging role of digital tools in agriculture.

Within the Critical Approach, the most notable finding is the high share of the “Agricultural Ecological Transformation” code, which is largely composed of the “Ecological Agriculture Practices” sub-code. This focus indicates that, in the Mitigation Document, ecological transformation is expressed primarily through agricultural practices rather than through more systematic or transformative frameworks.

In the Mitigation Document, “Value Orientations” are more evenly distributed than in the Adaptation document. “Economic Producer Rationality” in Theme 1 remains a core “Value Orientation”, with little emphasis on “Economic Loss” and “Development Discourse” appearing at low levels. The sub-code for “National Circumstances/Developing Country Status”, which is important in Türkiye’s mitigation policies, is only marginally present. In the Critical Approach, “Intersectional Justice” stands out, largely due to the emphasis on women producers and the high frequency of the “Gender Dimensions” sub-code. “Ecological and Intergenerational Justice”, as well as the “Right to Food and Food Sovereignty”, have low shares. The concept of “Just Transition”, which appears as a separate section in the Mitigation Document, is coded

only in places related to agriculture and has a low share—but its inclusion as a separate topic is significant for equality and social distribution.

Theme 1's "Governance Architecture" sub-codes in the Mitigation Document are more evenly distributed, but "Monitoring, Reporting, and Verification" is slightly more prominent than "State-Centered Coordination", "Stakeholder Participation/Governance", and "Expert-Oriented Governance". For the Critical Approach, the share is much lower than for Ecological Modernization. However, "Agricultural Credit Cooperatives, Producers and Producer Organizations" in the Critical Approach's "Governance Architecture" are coded more frequently than any other sub-codes in Theme 1 or Theme 2.

Five Main Findings:

Based on all the thematic data, the following five main findings were identified:

- 1.** In the Adaptation document, agriculture is treated as a sector affected by climate change and is placed in a passive position, whereas in the Mitigation Document, agriculture is considered a source of emissions, with no indicators related to the impact of climate change on agriculture. In both documents, the reciprocal relationship between climate change and agriculture is not fully established.
- 2.** In both documents, agricultural policies are structured around the ecological modernization approach. This is most evident in the "Solution Frameworks". "Digital and Technological Solutionism", "Agricultural Modernization", "Marketization", and "Governance" are all heavily featured in both documents.
- 3.** In the Adaptation Document, food security is instrumentalized as a concept narrowly centered on production and productivity. Notably, in the Mitigation Document, food security is entirely absent as either a legitimizing or conceptual tool. In both documents, the "Right to Food and Food Sovereignty" remain marginal. The near-absence of these concepts, combined with the weak presence of Theme 2 (Critical Approach) across both documents, points to a underlying understanding in which food is treated solely as a matter of production rather than as a matter of rights or sovereignty.
- 4.** Although justice-oriented and transformative policy alternatives remain marginal in both documents, their presence is not entirely absent. The emergence of codes related to "Ecological Agricultural Practices", "Gender Dimensions", and "Animal and Plant Welfare" within Theme 2 suggests that critical frameworks have at least found a marginal recognition in the policy discourse.
- 5.** The "Governance Architecture" code related to solutions is less detailed than the "Solution Framework" and "Value Orientations" in both documents. Nevertheless, the institutional structure of the proposed solutions is governance-oriented. Many actors are involved in the preparation process and in the action plans of the documents. However, the analysis shows that, despite the inclusion of many stakeholders, the critical approach holds only a small share of the decisions. In the Adaptation Document, for example, farmers are included only in training and support roles and are reduced to passive roles rather than being actors in adaptation action plans.

4. Discussion

The content analysis shows that the intricate relationship between climate change and agriculture is constructed differently across the reviewed documents. In the Adaptation document, agriculture is treated as a sector affected by climate change, one that needs to be protected from an external threat. The Mitigation Document, by contrast, frames agriculture as a sector that contributes to greenhouse gas emissions. Within the causality sub-codes, “Abstract and Widespread Reasons” such as “caused by human activities...” are prominent, while “Structural Causes” remain limited. The way the relationship is constructed and the definition of the problem determine the limits of the proposed solutions. Failure to address the root causes of the problem is common in policy documents. Swyngedouw (2010), analyzing how climate change is addressed, notes that while it is easy to accept that the accumulation of greenhouse gases is human-induced, the associated ecological problems and solutions are externalized, turning carbon into a fetish and thus radically rejecting the social relations and processes that gave rise to the problem. However, the documents clearly acknowledge the complexity of the issue. The high proportion of the Data/Information Deficiency sub-code under “Legitimacy Strategies” demonstrates that the documents openly admit the inadequacy of current climate data and institutional capacity, and the need to educate staff.

This study, which questions the transformation envisioned for agriculture in climate change policies, reveals that both documents ground agricultural policies in the framework of ecological modernization. Adaptation and mitigation policies for agriculture anticipate increased production, agricultural modernization, adaptation to market conditions, the use and dissemination of technology, enhanced institutional capacities, resource management, and inter-institutional governance. However, the dominance of these tools in the documents raises a fundamental question in the literature: Can technology, modernization, and market-based solutions truly transform the underlying systems that create problems in the relationship between climate change and agriculture? This is where the critical approach becomes relevant.

Foster, Clark, & York (2010) argue that the technology proposed by ecological modernization is treated as a *deus ex machina* (miraculous savior) capable of solving ecological problems without addressing social systems, yet problems cannot be solved in this way. Market mechanisms convert ecological value into economic value, and in the capitalist production system, efficiency improvements actually increase resource consumption rather than decrease it.

A closer examination of the “Agricultural Modernization” codes — “Standardization”, “Planning”, “Technicalization”, and “Infrastructure” — reveals patterns consistent with Scott's (2022) concepts of high-modernist and simplified agriculture. This model of modernization prioritizes calculation, technical interventions, and infrastructure development, yet in doing so, it systematically displaces the knowledge, practices, and livelihoods of local farmers.

A striking example of this technocentric approach is the Konya Paradox in the Adaptation Document. The document's Impact Chain Table on the Agricultural-Grain Sector and Drought assesses adaptation capacity exclusively through technical and infrastructural indicators — tractor numbers, irrigation coverage, insurance rates, and land consolidation. Yet the results

are paradoxical: provinces with high technical adaptation capacity still face severe drought risk, revealing that technical measures alone do not reduce vulnerability.

More tellingly, the table includes indicators — such as social capital, risk perception, and access to information — that are never actually used in the analysis. Their inclusion but non-use exposes how the document depoliticizes drought by reducing it to a purely technical problem, systematically excluding its social, institutional, and political dimensions.

Both documents reflect a fundamental orientation toward food that prioritizes production over rights. In the Adaptation Document, food security is instrumentalized as a concept focused on production and productivity. The Code Relations Browser confirms that food is framed as a commodity to be secured through production, price stability, and resource efficiency. In the Mitigation Document, “Food Security” is not used as a legitimizing resource. In addition, the “Right to Food and Food Sovereignty” appear at very low levels in both documents (Adaptation 5.2%, Mitigation 3.2%).

“Ecological Agricultural Practices” within the “Solution Frameworks” of the Critical Approach have the highest share across all codes in the Mitigation Document and are also significant in the Adaptation Document, indicating that ecological transformation is concentrated in practices. Giraldo & Rosset (2018) note that government agencies, international organizations, and private companies use agroecology not for its transformative potential but as a tool to offer technical options. They question whether agroecology, stripped of all but its most basic technical content, will become an empty concept like ‘sustainable development’. The documents answer that non-capitalist production practices are included only to the extent that they can be aligned with the framework of ecological modernization, stripped of their political values.

The governance architecture established in the documents is structured in a way that involves international organizations (United Nations Food and Agriculture Organization, Intergovernmental Panel on Climate Change) at the problem identification level, state institutions and directorates (Ministry of Agriculture and Forestry, Ministry of Environment, Urbanization and Climate Change) at the responsible institution level, and various institutions and organizations (universities, municipalities, provincial directorates, etc.) at the relevant institution level. There are differences between the relevant institutions in the adaptation and mitigation documents. The mitigation document includes producer organizations, civil society organizations, agricultural credit cooperatives, women's cooperatives, producer associations, and international organizations, which are not included in the adaptation document. The inclusion of civil society organizations and producer organizations in the mitigation document alone indicates that these actors are given a significant role in emission-reduction processes.

In this study, two main themes were constructed based on Elver & Güneş 's (2023) two perspectives: economic and rights-based. According to Elver, these perspectives are irreconcilable because they offer different answers to the identification of problems and the nature of the crisis. Furthermore, they cannot be brought together because the monopolistic structure of global food and agriculture companies dominates international decision-making mechanisms. For this reason, the economic approach prevails, while the rights-based approach is considered an alternative. The findings show that the documents reproduce the global

structure described by Elver: the economic perspective is dominant, while the rights-based alternative perspective is accepted only at the level of discourse—or only the aspects useful to technology companies and global agrifood corporations, such as ecological farming practices, are included.

A policy outcome-oriented toward ecological change must begin by clearly identifying the core issue: how industrial farming and economic policies increase risks to farmers and the environment. A targeted approach should explicitly address the complex relationship between climate change and agriculture, which extends beyond carbon emissions.

Such a policy framework would enhance the visibility of farmers, recognizing them as essential participants in decision-making processes rather than passive recipients of information. Smallholder farmers contribute approximately one-third of global food production (FAO, 2021). In Türkiye, there are about 3 million farms, the majority of which are small-scale, family-operated, and average 6 hectares in size (Climate Change Adaptation Strategy and Action Plan 2024–2030, p. 61). These producers, who are integral to the food supply chain, are particularly vulnerable to extreme weather events. Evidence indicates that small-scale producers adapt to climate change by employing agroecological and traditional practices, which they modify over time within specific cultural contexts. This adaptability has increased their contribution to food security during crises over the past two decades (Altieri & Nicholls, 2017). As primary implementers of climate adaptation and mitigation policies, the methods of small-scale producers are critical, although the challenge extends beyond achieving climate-resilient food production.

A policy document focused on ecological transformation should ground itself in the right to food and food sovereignty, not simply increased production. The core challenge is distribution, not lack of supply; global production can meet projected needs. Thus, the main argument for policy change is to create resilient, equitable, and biodiversity-conserving agricultural systems through a new paradigm.

These policy documents not only redefine ecological agricultural practices and rights, including climate and food rights, but also foster knowledge sharing and collaboration. Additionally, they introduce transparent and accountable decision-making mechanisms, such as food councils.

In the current policy document, a top-down knowledge system has been established through education, capacity building, and technical support. In contrast, in a policy document focused on ecological transition, traditional and local knowledge is incorporated into the design as an input. Consequently, horizontal knowledge sharing becomes a governance mechanism. The current documents largely structure financing through technology investments and market-based instruments. In a document focused on ecological transition, priority should be given to financing mechanisms that are directly accessible to small-scale producers and involve minimal bureaucratic burden.

These recommendations do not represent utopian ideals; elements of ecological transformation are already present in the policy documents under review. However, this transformation has predominantly remained rhetorical. A shift from rhetoric to implementation is necessary to establish systems that are more resilient to crises such as climate change.

5. Conclusion

This study analyzed Türkiye's the Adaptation Document and Türkiye's the Mitigation Document using MAXQDA24 Analytics Pro, examining them through three themes: Discursive Foundations and Policy Framework, Ecological Modernization, and Critical Approach. As a result, the findings directly answer the article's main and sub-questions and reveal a coherent policy architecture.

Neither document establishes a balanced account of the mutual relationship between climate change and agriculture. The problem definition remains asymmetrical and incomplete, grounded in "Abstract and Widespread Reasons" causes that reflect a one-sided active-passive framing. This is not incidental. The findings suggest that the problem is not first diagnosed and then answered; rather, a predetermined set of solutions is constructed as the natural and inevitable response, effectively reversing the logic of evidence-based policymaking.

The solutions and values developed to address the relationship between climate change and agriculture are framed by ecological modernization. The documents propose solutions such as modernizing agriculture, using technology and digital tools, and marketizing agriculture. This transformation, which preserves values like efficiency and productivity, is reformist. The critical approach is especially concentrated in the Mitigation Document, but even here, ecological agricultural practices are foregrounded. The "Governance Architecture for implementing these solutions is state-coordinated yet governance-oriented. The "Governance Architecture" codes of the Critical Approach are so marginal that the following conclusion can be drawn: traces of the critical approach can be seen in both documents, but they appear in a technicalized and depoliticized way.

The problem definition, legitimacy basis, solution practices, values, and governance structure built upon them are not unique to Türkiye; rather, they are shaped by the conditions and values of the neoliberal market system, in a manner largely consistent with the global trend. In the Adaptation Document, "Food Security" is framed in terms of productivity and efficiency, which emphasize economic rationality. The very limited presence of alternative approaches, such as the "Right to Food or Food Sovereignty", is consistent with the dominant framing of the document.

The dominance of the ecological modernization approach mirrors global trends. However, Türkiye is among the countries that distinctly experience the effects of climate change on the agricultural sector due to its physical and structural conditions. Therefore, it needs to develop policies with a much more balanced approach that is both locally and globally oriented.

The study's main limitation is that the analysis is based on two policy documents. However, because these are up-to-date and highly representative texts, the research question can be answered to a sufficient degree. Although the code scheme was developed through rigorous theoretical work, it remains open to different interpretations by other researchers. These limitations do not indicate inadequacy in the findings; rather, they highlight the need to deepen and broaden the critical evaluation begun by this study through further research.

Türkiye's unique conditions, the findings of this study, the existing literature, and the realities of a changing climate all point to agriculture as a critical research domain within climate change

policy. Future research could examine the impact of these policies on farmers and other actors through fieldwork. Comparative analyses drawing on national policy documents from countries sharing similar profiles — low historical responsibility for climate change alongside rapid development trajectories — would also constitute a valuable avenue for further inquiry.

The findings of this study, along with related academic research, have direct implications for policymakers tasked with revising and implementing strategy documents concerning agriculture within Türkiye's climate change adaptation and mitigation policies. The principal recommendations for policymakers are summarized below with specific actions:

1. *Problem Definition:* Climate change and agriculture are interrelated. Therefore, when drafting policy documents, the problem definition must account for this mutual interaction. Rather than limiting the definition to abstract, general references to the problem's causality, policymakers should adopt a structural, comprehensive definition that explicitly identifies industrial agriculture models and neoliberal economic policy conditions.

2. *The Concept of Food Security:* Food security should not be addressed solely in terms of production or availability, but must also take into account accessibility, acceptability, adequacy, and individual and institutional agency. Policies must reflect the multidimensional nature of the concept.

3. *Agroecological Practices:* Agroecological practices, which are included in both documents, should not be evaluated solely as technical options, as they would otherwise lose their transformative power. These practices must be addressed in conjunction with their institutional, political, social, and cultural dimensions; appropriate policy and legal frameworks must be established to ensure their implementation in the field.

4. *Producers and Producer Organizations:* Producers and the civil society organizations they form must be given structured and active roles in the design, implementation, and monitoring of mitigation and adaptation plans.

5. *Food Sovereignty and the Right to Food:* Policies must prioritize the values of food sovereignty and the right to food; institutional and legal frameworks supporting these values must be clearly defined and implemented.

6. *The Konya Paradox:* As demonstrated by the Konya case study in this research, treating drought solely as a technical issue and excluding its social, institutional, and political dimensions leads to the exclusion of vulnerability from the political sphere. These dimensions must be incorporated into risk analyses. To support this, field research must be conducted and data collected.

In short, current policy frameworks are largely based on the ecological modernization approach. This approach need not be completely abandoned. Ecological modernization contributes to climate change adaptation and mitigation processes by promoting governance, education, modernization, and the use of technology. However, policy documents must be restructured in line with the priorities of ecological transformation, which are currently only partially addressed.

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ETHICS

The authors declare that this article complies with ethical standards and rules.

USE OF ARTIFICIAL INTELLIGENCE

The authors have declared that she has adhered to the COPE guidelines and policies regarding the use of artificial intelligence tools.

AUTHOR CONTRIBUTION

Buşra Korkmaz  I General Contribution rate: %60

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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