Bahar Elagöz Timur

Ph.D. Thesis

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DEVELOPING A MODEL FOR SUSTAINABILITY OF RURAL HERITAGE IN TRANSITION: CASE OF KAYSERI BAĞPINAR

A THESIS
SUBMITTED TO THE DEPARTMENT OF ARCHITECTURE
AND THE GRADUATE SCHOOL OF ENGINEERING AND SCIENCE
OF ABDULLAH GUL UNIVERSITY
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

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SCIENTIFIC ETHICS COMPLIANCE

I hereby declare that all information in this document has been obtained in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all materials and results that are not original to this work.

Bahar Elagöz Timur

REGULATORY COMPLIANCE

Ph.D. thesis titled **"Developing a Model for Sustainability Of Rural Heritage in Transition: Case of Kayseri Bağpınar"** has been prepared in accordance with the Thesis Writing Guidelines of the Abdullah Gül University, Graduate School of Engineering & Science.

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ABSTRACT

DEVELOPING A MODEL FOR SUSTAINABILITY OF RURAL HERITAGE IN TRANSITION: CASE OF KAYSERI BAĞPINAR

Bahar Elagöz Timur
Ph.D. in Architecture
Advisor: Prof. Dr. Burak Asiliskender
January 2024

This thesis aims to develop a model for the resilience and sustainability of rural heritages against transition risks and contribute to rural heritage conservation by creating living heritage sites. Additionally, the thesis explains how habitus and rural heritage are dynamically interconnected by emphasizing their organic relationship. Rural heritages, primarily constructed with traditional building techniques, architectural habits, and local materials, inherently reflect the everyday life practices shaped by their users' habitus. These unique lifestyles provide insights into the cultures of communities, aiding in the understanding of larger societies. Therefore, any demand for changes in habitus and everyday life practices directly threatens rural heritage areas.

The study highlights the threats posed by the transition of habitus on rural heritage due to emerging demands for change and discusses the risks it poses to rural heritage sites. Sometimes, as rural-to-urban migration increases, and at other times, changes in rural habitus and everyday life practices due to technology and modern life emerge. Understanding this balance of relationships and developing sustainable conservation approaches by calculating the risks through vulnerability is the main objective of this thesis. In this context, a sustainability model (RUHET) has been developed for rural heritage in transition, and conservation strategies through vulnerability assessments have been explained. The model was applied to the rural heritage area of Bağpınar in the Melikgazi district of Kayseri province, and the results were presented.

Keywords: Rural heritage conservation, Habitus, Vulnerability assessment, Multi criteria decision making, Bağpınar.

ÖZET

DÖNÜŞÜM İÇİNDEKİ KIRSAL MİRAS ALANLARI ÜZERİNE BİR SÜRDÜRÜLEBİLİRLİK MODELİ; KAYSERİ BAĞPINAR ÖRNEĞİ

Bahar Elagöz Timur
Mimarlık Anabilim Dalı Doktora
Tez Yöneticisi: Prof. Dr. Burak Asiliskender
Ocak 2024

Bu tez kırsal miras alanlarının değişim karşısındaki risklere karşı dirençli bir şekilde korunması ve sürdürülmesi üzerine bir model geliştirmeyi ve bu modelin yaşayan miras alanları yaratarak kırsal miras koruma konularına katkıda bulunmayı amaçlamaktadır. Ayrıca tez habitus ve kırsal mirasın organik ilişkisine vurgu yaparak birbirlerine nasıl devingen bir döngüyle bağlı olduklarını açıklar. Geleneksel yapım tekniği, mimari alışkanlıklar ve yerel malzemeyle oluşturulan, temelde işleve bağlı ve düşük bütçeyle inşa edilmiş kırsal kültür mirası, kullanıcılarının habitusunun ortaya çıkardığı gündelik hayat pratiklerini yansıtır. Yerel ve geleneksel bu özgün yaşam biçimleri toplumların kültürleri hakkında bilgiler vererek daha büyük toplulukların anlaşılmasına yardım eder. Bu sebeple habitus ve gündelik hayat pratikleri üzerindeki herhangi bir değişiklik talebi kırsal miras alanlarını doğrudan tehdit eden riskler haline gelmektedir

Çalışma habitusun dönüşümüne bağlı ortaya çıkan değişim taleplerinin kırsal miras üzerinde yarattığı tehditlere dikkat çeker ve kırsal miras alanlarında yaratacağı risklerden bahseder. Bazen kırdan kente göç artarken, bazen de kırsal habitus ve gündelik hayat pratikleri üzerinde teknoloji ve modern hayatın getirdiği birtakım değişimler ortaya çıkmaktadır. Bu ilişkiler dengesinin anlaşılması ve oluşan risklerin kırılganlık üzerinden hesaplanarak sürdürülebilir koruma yaklaşımları geliştirmek bu tezin ana amacıdır. Bu kapsamda dönüşüm içerisindeki kırsal miras için bir sürdürülebilirlik modeli (RUHET) geliştirilmiş ve kırılganlık değerlendirmeleri üzerinden koruma stratejileri üretme yöntemleri açıklanmıştır. Model Kayseri ili, Melikgazi ilçesinde bulunan, Bağpınar kırsal miras alanı üzerinde denenmiş ve sonuçlar tartışılmıştır.

Anahtar kelimeler: Kırsal mirasın korunması, Habitus, Kırılganlık, Çok kriterli karar verme yöntemler, Bağpınari.

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LIST OF ABBREVIATIONS

AHP	Analytic Hierarchy Process
COE	Council of Europe
DM	Decision Maker
ICH	Intangible Cultural Heritage
ICOMOS	International Council on Monument and Sites
ICOMOS-ICORP	International Scientific Committee on Risk Preparedness
ICOMOS-IFLA	International Scientific Committee on Cultural Landscapes
ICCROM	International Centre for the Study of the Preservation and Restoration of Cultural Property
IPCC	Intergovernmental Panel on Climate Change
KKVBK	Kayseri Kültür Varlıklarını Koruma Bölge Kurulu
MCDM	Multi-Criteria Decision Making
MAUT	Multi-Attribute Utility Theorem
MAVT	Multi-Attribute Value Theorem
UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UN/ISDR	United Nations- International Strategy for Disaster Reduction
UNISDR	The United Nations Office for Disaster Risk Reduction
RUHET	Sustainability of Rural Heritage in Transition Model
TÜİK	Turkish Statical Institute

To my family,

Chapter 1

Introduction

Rather than being designed by an architect, rural settlements are produced by their users using local (vernacular) and traditional methods based on their natural environment's climatic and topographic conditions. Constructed in organic relationships with the natural environment and landscape in which they are built, these areas are designed considering the daily practices of ordinary people who are their users. Traditional rural settlements, whose vulnerabilities are increasing daily, are areas that convey the lifestyles, architectural styles, building technologies, construction techniques, landscape features, and craftsmanship of their periods and require a holistic and unique perspective to preserve. The loss of traditional rural settlements shaped by the everyday life practices, traditions, building technologies, and cultural activities of past societies, within limited opportunities, leads to the cultural impoverishment of the world and the weakening of humanity's connections with the past. Undoubtedly, the change or complete loss of habitus, the primary element that enables the existence of rural settlements jointly created by humans and nature, is linked to the rural landscapes as heritage, affecting all tangible and intangible heritage values, including open and closed spaces.

The Industrial Revolution and its consequences led to a decrease in the population, and the industrialization that developed in the agricultural sector caused radical changes in rural landscape areas. As rural regions experiencing population loss disappeared, those that survived also began to lose their local and traditional characteristics due to the impact of industrialization. Following these radical changes and losses, discussions about the importance of vernacular rural architecture began. Historical rural areas and their landscapes and cultural features started to be defined as cultural landscapes and were added to the UNESCO World Heritage Convention in 1992. Nevertheless, various definitions such as “local/traditional architectural heritage,” “rural architectural heritage,” “historical rural heritage,” “cultural landscape,” and “rural landscape as heritage” continued to be used. In 2013, the ICOMOS Turkey National Committee defined traditional architectural heritage as: In a world rapidly losing its diversity with the

development of technology and communication possibilities, structures and settlements reflecting local identity with region-specific materials and techniques. Today, it is widely accepted that rural landscapes, along with all their components, such as people, domestic and wild animals, dwellings, production structures, roads, trees, agricultural and forest areas, water sources, and traditions, must be preserved. In the scope of the thesis the term “rural heritage” is preferred for covering rural landscapes and beyond.

Rural heritage, which directly connects with the socio-cultural habits, daily and social practices of locals, and the natural environment in which it exists, faces challenges in conserving its rich cultural and natural heritage due to factors such as their alteration or disappearance. This makes it essential to take measures to protect this valuable cultural and natural heritage. Without appropriate measures and a defined management approach, the certainty of losing the cultural heritage values of rural culture in the face of changes in the natural, built, and socio-cultural environment becomes apparent.

1.1 Definition of the Problem

Rural heritages are under the pressure of transformation due to the developments of the changing world are complex and dynamic heritage areas. Hence, conserving them requires a comprehensive understanding of the intricate processes involved in their formation and transformation. A historical rural fabric is formed by tangible aspects like natural, geographical, and climatical aspects, as well as current architectural knowledge of the context and intangible ones, particularly everyday practices, production habits, culture, and history. In addition, these tangible and intangible features create the spirit of the place and, accordingly, cultural heritage values. The significance of tangible expressions of the rural landscapes as heritage lies in their comprehension of the associated intangible values. Therefore, when one of these aspects gets harmed, the dynamic link between them will be damaged, and the loss of the cultural heritage will start.

Vernacular architecture, encompassing not only buildings but all rural structures, is constructed to meet the specific needs reflecting the cultural values, socio-economics, and lifestyles of the community in which it originates (Oliver, 2006). Conserving these sites, representing communities' traditions and ways of life, requires a different approach than

monumental structures to identify the necessary cultural heritage values. Identifying and protecting the relationships that emerged through human interaction is essential to reveal and sustain the values of historical rural settlements that interacted with humans and the environment during their use. These areas, reflecting our traditional production, consumption, and way of life, as well as our relationship with the natural environment and intangible values, namely our habitus, are threatened by deterioration, extinction, and homogenization. These structures and settlements, produced in a natural environment that is interactive and distinct from the sameness found in modern urban or rural areas, are most threatened by changes from habitus-related transformations influenced by everyday life practices. Therefore, a holistic conservation approach should be used by considering the integrity of the cultural heritage's tangible and intangible features.

The main problem that is tried to answer with this research is the results of the unforeseen nature of the habitus transition in the rural landscapes as heritage. This thesis research concentrates on the conservation problems and risks caused by the changes in the tangible and intangible environment in the context of rural landscapes as heritage. In this regard, it mainly covers generating a model for developing strategies for sustainable conservation actions against the transition by extended analyses of vulnerabilities.

1.2 Aim and Scope

Even the former international texts had referred to some part of it; the particular and holistic description of the historical rural settlements was developed six years ago. ICOMOS-IFLA announced the “rural landscape as heritage” description, which covers the physical attributes besides the linkage and settings between them, culture, and environment. Their conservation encompasses not only the physical aspects of the land but also the intangible cultural knowledge, traditions, practices, and expressions that contribute to local human communities' identity and sense of belonging. Moreover, these landscapes hold significant cultural values and meanings assigned to them by past and present generations (ICOMOS-IFLA, 2017). One of their leading values relies on the interactions between human beings and the natural world, which creates technical, scientific, and pragmatic knowledge of the settlements. This interaction creates a dynamic and alive lifecycle between the rural landscapes as heritage and their habitus. Therefore, the uncontrolled transitions on the habitus will inevitably affect the heritage. Considering

these discussions, the thesis aims to develop a conservation model to create resilient and sustainable rural heritage amid habitus transition.

The thesis has 6 main chapters, which have hypothetical and empirical studies. The first one is the introduction, which describes the outline of the thesis in correlation with the objectives, scope, research questions, and hypothesis. The second part of the thesis mainly covers the hypothetical part. It constitutes the theoretical framework between the rural heritage and habitus. In contrast, the third part focuses on the risk studies in cultural heritage and MCDM methods and their application to cultural heritage studies. The fourth part institutes a model for developing sustainability strategies and providing conservation methods by considering vulnerabilities. The study's fifth part, which is the empirical part, includes applying the model to the selected rural landscape as a heritage site: Bağpınar, Kayseri. The reasons and results of the changes are defined, and vulnerabilities are assessed for the Bağpınar. Finally, the sixth part refers to the final evaluation, prospects, and suggestions. In conclusion, this study is not an ordinary risk study and does not cover risk assessments; it focuses on vulnerabilities of the rural landscapes of heritage for discussing the sustainability possibilities, including resilience approaches.

The theoretical framework of the thesis is constituted in the second chapter: the relation of the habitus and rural landscape as heritage. The aims of this chapter can be listed as follows;

- Comprehending and discovering the relationship between habitus and traditional/local architecture,
- Exploring the factors that cause habitus transition,
- Investigating the pressure exerted by habitus change on rural landscapes as heritage and examining the conservation challenges it triggers.

In addition, this section investigates the significance of the habitus on traditional rural landscapes and their creation process. The central claim is that the traditional rural landscapes can be perceived only with intangible aspects occurred by the habitus. Habitus describes the individual and social dispositions in space and their habits. Grenfell states that habitus offers a rich understanding of depicting both objective and subjective manifestations of the social world, facilitating the comprehension of social practices (Grenfell, 2014). One of the main concerns is that if these social practices and nature shape the physical environment when they change, can the physical environment be

affected? Therefore, after explaining the rural heritage, habitus, and their balance, this part of the study focuses on the effects of the changes. It examines the reasons for the transition in the subject areas and discusses it as a threat to the cultural heritage.

The third chapter comprises two principal sections: discussions about risk, resilience, and sustainability studies and MCDM methods as an assessment method for cultural heritage. The first section of Chapter 3 involves the risk, resilience, and sustainability studies in the cultural heritage for answering the habitus transition threat. The alive structure of the habitus necessitates a dynamic approach. With these concerns and the effects of the transition on the traditional rural landscapes, an active and comprehensive method covering not only today but also the future is required. The resilience approaches can differ from the sustainability in this manner. The durable nature of the sustainability approaches can be enriched with resilience though for complex cultural heritage sites like rural landscapes. Resilience refers to actively adapting a system under any threat instead of preserving it as the same (Folke et al., 2003). Therefore, this part will discuss new sustainability approaches with the risk discussions for cultural heritage. Plenty of discussions examine vulnerability and resilience and claim that they have opposite meanings to different degrees. While increased sustainability and resilience reduce the likelihood of damage and facilitate quicker and more efficient recovery, heightened vulnerability amplifies the exposure to potential loss and damage (Buckle et al., 2001). This viewpoint also expresses that vulnerability indicators can help in assessing resilience. Therefore, the thesis focuses on vulnerability studies instead of the risk assessment. The second section of Chapter 2 aims:

- Discussing appropriate conservation methods in response to the identified threat,
- Investigating resilience as a method for sustainable cultural heritage conservation.

Second section addresses the The Multi-Criteria Decision Making (MCDM) Methods discussions, application to the cultural heritage studies and selection of the required methods for the offered model (RUHET). The main aim of the chapter is;

- Discussing the MCDM methods and their use in cultural heritage studies
- Selecting appropriate methods for the vulnerability assessment of the rural heritage in transition.

The hypothetical part of the thesis continues with Chapter 4 by creating and explaining a sustainability model (RUHET) for the rural heritage in habitus transition. The primary aims;

- Proposing a method to assess the vulnerabilities of rural heritage in habitus transition by creating an indicator decision tree and
- Guiding to generate sustainability strategies based on rural heritage's identified threat and vulnerability indicators.

Due to the discussions in Chapter 2, the fourth chapter includes hazard identification and understanding and revealing the habitus and its transition. Since the research in Chapter 3 states that sustainability problems related to the risks can be handled by decreasing vulnerabilities, the central part of the chapter consists of the explanation of the vulnerability assessment method offered. The model accepts the vulnerability as a function of the susceptibility, coping, and adaptive capacity criteria. According to these criteria, a decision tree for assessing the vulnerability of the rural heritage in transition is created, and indicators are explained for the process. Together with the description of the stages of the model, the selection of the executor, experts, and case study is defined. In addition, the chapter is finalized to shed light on producing guides on sustainability strategies.

The empirical part of the thesis is formed by only Chapter 5. The chapter aims to try the developed model in a selected rural heritage area to identify its strengths and weaknesses and demonstrate its applicability. Bağpınar Settlement is chosen as the case study area for the practice of the offered model. In this context, Bağpınar hazard research and vulnerability assessment is realized according to the RUHET indicators. The expert group decision-making is represented as an example.

The sixth chapter is the conclusion, which is the final complementary component of the thesis. This chapter assesses the entire process and provides recommendations for suggesting resilience strategies for the rural landscape as heritage in the changed world.

1.3 Hypothesis and the Research Questions

The thesis is based on the hypothesis that *"Recognizing habitus transition as a threat and its risks and aiming to assess and manage the vulnerabilities makes it possible*

to create sustainable rural heritage in the face of potential change today and in the future." Therefore, the main research question of the thesis, which promotes the hypothesis, is *"How can the sustainability approaches developed with resilience though be applied to conserve the rural heritage in habitus transition?"*.

Moreover, four sub-hypothesis and related questions are assigned to be summarized as follows (Figure 1.1).

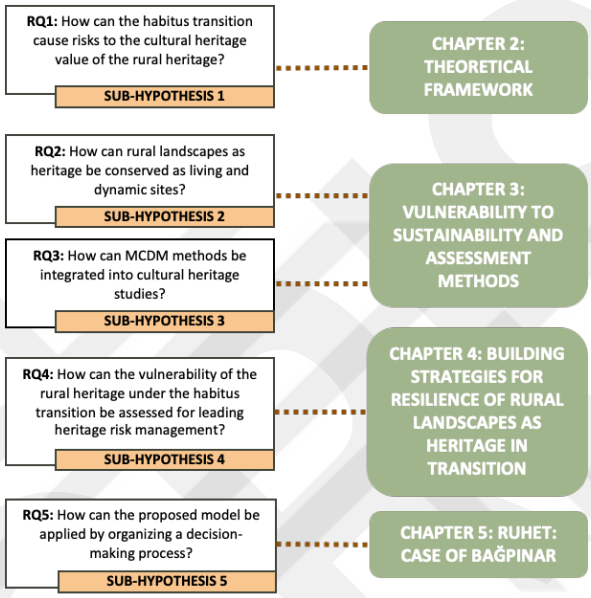


Figure 1.1 Research questions and related chapters

Hypothesis 1: For various reasons, the transition of habitus, which is dynamic with the built and natural environment components, can lead to conservation problems in rural heritage, where they mutually influence each other within an active cycle. It can be one of the most critical threats to cultural heritage with its unforeseen nature.

Clarifying the relationship between habitus and rural landscape relation can result in the reveal of the threat. Cultural heritage conservation starts with accepting the threat and continues with management strategies according to the threat characteristics. The primary research question and the sub-questions aligning with this hypothesis are listed as follows:

How can the habitus transition cause risks to the cultural heritage value of the rural heritage?

- What does habitus refer to?
- How is the habitus concept evolved?

- What does the rural landscape as heritage mean?
- What are the dynamics between habitus and rural landscapes as heritage?
- How can transition threaten the rural landscapes as heritage?

Hypothesis 2: Sustainability, which is expanded with resilience, can be the most convincing approach with its dynamic structure on the living rural heritage under the transition threat.

Traditional rural settlements represent the vernacular habits and culture of the local people due to the environmental features. Together with natural and human-induced factors and modern life requirements, the practices of the communities can change, and this can cause even tangible and intangible heritage damages. This visa-versa relationship requires a holistic conservation approach for the survival of the vernacular features and cultural heritage value. Hence, the primary research question and the sub-questions aligning with this hypothesis are listed as follows:

How can rural landscapes as heritage be conserved as living and dynamic sites?

- What are the risk studies of the cultural heritage field?
- What is the meaning of resilience and sustainability?
- How was the term resilience developed in relation to risk studies?
- What is the relation between risk, resilience, and sustainability?
- How does vulnerability assessment contribute to creating sustainability?
- How can risk assessment approaches be applied to cultural heritage studies?

Hypothesis 3: As the complex systems, rural landscape as heritage, which encompasses various dimensions, including socio-cultural, economic, ecological, and architectural considerations, should be assessed with MCDM, which is comprehensive and complex.

The offered model emphasizes the importance of recognizing the threat and assessing the vulnerabilities of the heritage for suggesting management strategies. Together with vulnerabilities, susceptibilities, and capacity of the heritage areas can be identified. There are many methods for assessing it, and according to the heritage features, it needs to be selected. As a result, the primary and sub-questions of this part of the study can be listed as:

How can MCDM methods be integrated into cultural heritage?

- What is the MCDM, and how can it be used in cultural heritage studies?
- Which fields of cultural heritage apply the MCDM methods?
- Which methods can be applied to assess the vulnerabilities due to the transition?

Hypothesis 4: To create sustainable rural heritage against habitus transition, it is essential to investigate the factors causing change and assess and decrease the sensitivity, and strengthen coping and adaptive capacity with threats today and in the future.

The habitus transition triggers the loss of tangible and intangible cultural heritage values, and the sustainability of these heritage areas can be provided with risk management. Due to the differences of the threat studied in the scope of the thesis, this study focuses on the decreasing vulnerabilities for developing sustainability. The primary and secondary investigations of this segment can be identified as follows:

How can the vulnerability of the rural heritage under the habitus transition be assessed for leading heritage risk management?

- What are the principal vulnerabilities of rural heritage under transition threat?
- How can the reasons for the habitus transition be discovered?
- What are the general principles of the proposed model for the resilience of rural landscapes as heritage?
- What methods and steps should be followed to create the model for sustainable rural landscapes as heritage in the face of transition?
- Who can benefit from the model?
- How can the executor of the model be selected?
- How can the results of the model develop resilience strategies?

Hypothesis 5: The suggested model should be tested on a sample area to assess its capability to produce the anticipated resilience strategies, as well as its practicality, strengths, and weaknesses. It should also serve as an exemplar for individuals and institutions employing it.

The model offered in the thesis justifies the importance of decision structuring, selecting the executor, making expert group decisions, and documenting the rural

landscape as heritage. As the final step of the research, the case study points out that the central and sub-questions correspond to the hypothesis:

How can the proposed model be applied by organizing a decision-making process?

- Does the proposed model achieve the goals by generating resilience strategies for the selected rural landscape as heritage?
- What are the limitations of the model?
- What are the strengths and weaknesses of the model?
- What are the challenges encountered in the use of the model?

1.4 Research Methods and Thesis Stages

This section primarily outlines the analysis methods employed in the study and introduces the thesis flowchart. The in-depth literature review is coupled with the results of surveys and observations administered to various rural landscapes as a heritage for generating a resilience model and an application represented on a vernacular rural settlement of Kayseri. The literature review is crucial as it aids in creating the decision tree, implementing the model, assessing its outcomes, and contributing to comprehensively formulating resilience planning policies and tools.

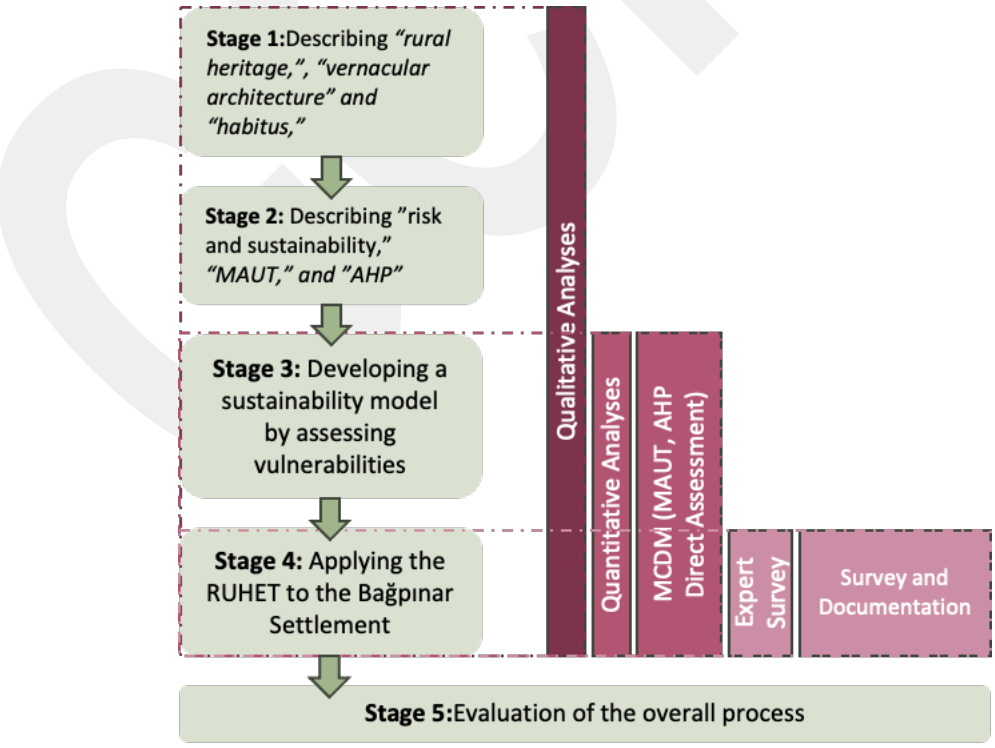


Figure 1.2 Stages and methods of the thesis

The thesis consists of the five main research stages (Figure 1.2). In the first stage, through the use of qualitative data collection methods, the term habitus and its relationship with vernacular architecture, as well as the consequences that rural landscapes as heritage undergo in the face of habitus transition and its damage to the heritage values, have been analyzed in detail via existing literature. The literature reviews on habitus encompassed articles, research reports, books, and theses that aimed to elucidate the term's origins, various aspects, and characteristics. These works also provided definitions of habitus in the context of vernacular architecture. The information obtained in this section has guided the establishment of the vulnerability criteria and indicators of the model.

As defined as the most appropriate and comprehensive method for the complex heritage site vulnerability assessment, the second stage explains the Multi-Criteria Decision-Making methods via literature studies. After giving general information about the MCDM methods, the cultural heritage studies that applied these models are compared according to their areas of applications, evaluation methods, aims, type of indicators, decision-makers, and type of indicator evaluations. Afterward, the methods suitable for the proposed model's purpose and scope were identified, and their fundamental features and mathematical foundations were detailed.

The third section involved qualitative and conceptual analysis, aiding in formulating, identifying, and delineating critical concepts related to risk, sustainability and resilience. These concepts collectively form the conservation approach of the thesis against the defined threats. Through this examination, it became evident that there is a literature tendency regarding the practicality of applying vulnerability assessment in cultural heritage studies. As part of the continuity of the hypothetical part of the study, the RUHET model was offered at that stage. According to these studies, the assessment and decreasing vulnerabilities of the rural heritages is described as a method of increasing resilience. International texts about cultural heritage helped highlight the susceptibility, coping and adaptive indicators decisions.

The fourth stage covers applying the model to the Bağpınar vernacular rural settlement of the Kayseri. The methods of this part are listed;

- Qualitative, quantitative, and conceptual analysis for the emergence of the habitus and vernacular architecture of the site by using literature studies, archive research, interviews, surveys, and documentation.
- Data was collected from the site by filling vulnerability cards by surveying selected heritage properties of Bağpınar.
- MAUT, Direct Assessment, and AHP methods were used for the vulnerability assessment. With a Google Forms document, AHP pairwise comparison decisions are collected and calculated.
- Depending on the finalized decision tree and vulnerability card data, the vulnerabilities are created and implemented via Microsoft Excel.

The final section of the study discusses, based on the comprehensive literature review and vulnerability analyses, how RUHET proposes alternative solutions to mitigate the effects of lack of coping capacity and susceptibility identified through the research within the specific context of the various rural landscapes as heritage.

1.5 Literature Review

The main purpose of the literature review is to investigate the resilience and vulnerability studies in the cultural heritage field regarding sustainability. Due to the hypothesis of the thesis about habitus transition as a new hazard for cultural heritage, risk and heritage studies were also examined. Additionally, a brief literature summary on the use of MCDM in cultural heritage studies is provided in Chapter 3.

While the subject of cultural heritage and risk can be diversified, the literature generally focuses on risks associated with natural and sudden destructive impacts. In a search conducted in the Web of Science database using the keywords "risk" and "heritage" in the field of architecture, 24 studies related to seismic/earthquake risks, and 3 each related to flood, fire, and climate change risks were identified. In another search using the keywords "vulnerability" and "heritage," 36 studies on damages caused by seismic/earthquake and 1 study on fire-related damages were found in the field of architecture.

The earliest study found in both searches was published in 2006. Greco et al. (2018) revealed the seismic vulnerabilities of traditional masonry buildings in the historic center

of Sicily and demonstrated how they would behave during an earthquake. Brando et al. (2019) demonstrated the behavior of historic centers in Peru not at the level of individual structures but throughout the entire historic city. Both studies shed light on the sensitivity of selected historical heritage areas to sudden and destructive seismic risks, providing insights into the necessary precautions. Canuti et al. conducted similar studies, conducting research on historic churches in the Marche region of Italy after the 2016 earthquake, comparing predicted damage with post-earthquake damage assessments. In contrast to these studies, Matteis et al. (2019) conducted seismic vulnerability studies on some historic Italian masonry churches and also worked on measures to be taken in the face of these vulnerabilities. Noronha Vaz et al. (2012) emphasized that uncontrolled growth in the cities of the future poses a threat to heritage areas within the city and identified the sensitivity of heritage areas to growth through their selected sample area, the Algarve region.

Berto et al. (2017) attempted a multidisciplinary approach to determine the overall vulnerability of architectural cultural heritage to all hazards and chose the Tempietto Barbaro, listed as a World Heritage by UNESCO, as a case study. This study followed a three-step process as outlined in the Italian seismic risk assessment guide: 1. Historical research, documentation, and material character analysis referred to as the "knowledge path," 2. Identification of external damages suffered by the structure currently or in the past, and 3. Development of analysis methods based on the construction system and the current and future structural character of the building. At the end of this analysis series, it was emphasized that structures and architecture must adapt due to the environment in which they exist and the various potential risks they face. It was highlighted that cultural heritage structures can be sustained by preserving their dynamic nature.

Keller et al. (2017) argue that historical cities and architectural heritage, being complex systems, can only be understood through a multidisciplinary approach. They conducted studies on the resilience and adaptation of the Oravita historical city to climate change from the perspectives of architecture, landscape, history, economics, and geography. Collaborating across these disciplines, they determined the damages incurred by the historical city due to climate change and its susceptibility. Additionally, intervention decisions were made to enhance resilience. Similarly focusing on climate change risk, Posani et al. (2019), unlike their predecessors, worked at the building scale.

They addressed thermal issues arising from climate change and proposed various solutions applied to the building envelope to ensure resilience.

Kishali and Rosina (2018) examined the risks faced by the Fener-Balat area in İstanbul and its preservation status after rehabilitation efforts in the 20th century, considering the urban development of Istanbul. The urban resilience study for the Fener-Balat area was planned with a focus on social, cultural, economic, and environmental values. However, the study identified how the changing urban policies and evolution of İstanbul over the years threatened the area's social and cultural structure, as well as its economic and architectural values.

Besana et al. (2018) focused on the effects of reuse on the continuity and resilience of cultural heritage. They emphasized assessments of accessibility, adaptability, and modifiability for sustainable reuse.

Martins et al. (2020) provide a notable example in their study of Lisbon, Baxia Pombalina, focusing on determining the vulnerability of urban cultural heritage areas to potential risks. This study goes beyond assessing tangible heritage and calculating the vulnerability of intangible heritage through discussions based on communities' heritage ownership. Using literature reviews, municipal data, GIS mapping, and fieldwork, the study analyzes how changes in urban structure and social dynamics affect the sensitivity of heritage to natural and human-induced hazards. They propose a framework for preventive measures for the historic center of Lisbon. According to this management plan, the study should commence by identifying the heritage area's natural, settlement-related, social, and economic characteristics, followed by determining heritage values. After identifying the risks and assessing the vulnerability resulting from changes triggered by these risks, potential outcomes are listed. This work is a significant example of evaluating risks related to urban changes not at the building scale but at the scale of historic urban areas.

Ortiz and Ortiz (2016) have prepared a detailed damage susceptibility assessment matrix for cultural heritage. They chose the historic city center of Seville as an example, which encompasses various preservation conditions and has experienced various issues such as fire, earthquake, flood, and uncontrolled urban growth. Using this matrix, they evaluated the structures in the historic center based on what they identified as the primary

causes of material and structural deterioration, namely structural instability, material decay, pollution, and human-induced degradation. The distinctive aspect and significant contribution of this study to the literature lie in individually highlighting the susceptibility of each structure to damage and the possibility of determining preventive conservation parameters specifically for each structure. These tailored interventions will contribute to more efficiently using allocated conservation budgets. Ortiz and Ortiz focused solely on structural and material deteriorations, providing an assessment of damage susceptibility within this framework.

Jin (2018) distinguishes his work by emphasizing the adverse impact of urbanization-induced human-made problems on historic cities, making them vulnerable to risks. He identifies and examines human-induced risks related to urbanization as urban planning issues, heavy traffic, urban ecological risks, technological disasters, criminal activities, and inappropriate use of heritage areas. As a preventive conservation approach, he suggests paying attention to urban heritage areas in urban planning, identifying, evaluating, and managing human-induced risks, digitizing heritage, keeping it under control, and adopting a participatory heritage conservation approach. In this study, Jin draws more general conclusions by leveraging existing literature and does not practically test his recommendations on a specific case study.

When the doctorate thesis is researched in Türkiye via the Council of Higher Education Thesis Center, five theses related to some part of the thesis subject are explored. Özlem Karakul (2011), in her thesis titled "A Holistic Approach to Historic Environments Integrating Tangible and Intangible Values Case Study: İbrahimpaşa Village In Ürgüp," focuses on the intertwined relationship between tangible and intangible aspects of the cultural heritage. She also indicates that the daily and social practices, habitus, and vernacular architecture create each other and explains this link in the Ibrahimpaşa Village Case. Karakul's study resembles the thesis with the habitus and vernacular architecture/rural landscape as heritage approaches.

Zeynep Deniz Yaman Galantini (2018) mentioned resilience in the architecture and urban scale for the first time with the title "Urban Resilience As A Policy Paradigm For Sustainable Urban Planning And Urban Development: The Case Of Istanbul." After determining some parameters, she applied several stakeholders' thoughts via in-depth interviews about the urban resilience of Istanbul and created maps according to the results.

Sibel Yıldırım Esen (2014) focused on the risk assessment of archeological sites with her thesis titled: " Risk Assessment of the Archeological Heritage at Territorial Scale the Case of İzmir Metropolitan Area." This is one of the pioneers of studies on risk assessment of cultural heritage in Türkiye. She prepared hazard, vulnerability, and risk maps based on the GIS data. The hazards are analyzed in three titles: natural factors, institutional developments, and human-induced groups. She used heritage assessment cards without using any assessment method required calculations with defined values. She used maps for the representation and interpretation of the results.

Banu Gökmen Erdoğan's thesis subject is the flood risk assessment of the cultural heritage in the case of Edirne. She prepared a MİSRAM model that uses a decision tree to assess vulnerability, susceptibility, and coping capacity(Gökmen Erdoğan, 2022). Aysel Tarım centers the fire risks on wooden cultural heritages and develops an assessment model in her thesis titled: "A Model Proposal for the Management of Fire Risks Associated with Historic Wooden Buildings in Istanbul." (Tarım, 2023). After discussing the fire as a sudden, severe, and devastating threat to the cultural heritage, she offered the TAYYRAM method, which consists of susceptibility and coping capacity assessments. Although these two risk assessment methods applied decision three with criteria, sub-criteria, and indicators, there is no clear information about the used decision-making method. They referred to former studies about fire and flood risk assessment. This thesis is differentiated from them according to selected cultural heritage, claimed new threats, and used methodologies. Due to the absence of sustainability approaches against habitus change, this thesis offered a new model using the MCDM method combinations. Also, this study uses different actors as decision-makers for the different stages of the provided model.

Literature research has shown that the majority of studies in the literature on the cultural heritage and documents published by relevant organizations have predominantly focused on natural disasters and climate change crises as significant threats. Although disaster risks are defined as natural and human-induced, efforts to prevent human-induced risks to cultural heritage have often been limited to protecting heritage from conflicts during wartime. While there have been studies on preserving and making tangible heritage resilient in the literature, and the crucial role of cultural heritage in ensuring social and cultural resilience has been emphasized numerous times, there is a lack of research on the vulnerability and sustainability of tangible heritage regarding intangible

one. For living heritage areas, one significant threat is the unnoticed emergence of deterioration over time, resulting from abandonment or uncontrolled interventions. The unique aspect of this study lies in acknowledging the risks posed by the changes in habitus and daily life over time in rural landscapes as heritage, which have yet to be extensively addressed in the pioneering works in the literature. Also, by developing a new decision tree for the vulnerability assessment against the habitus transition, applying expert group decisions, and creating management strategies, it is aimed to contribute to the literature with the RUHET.

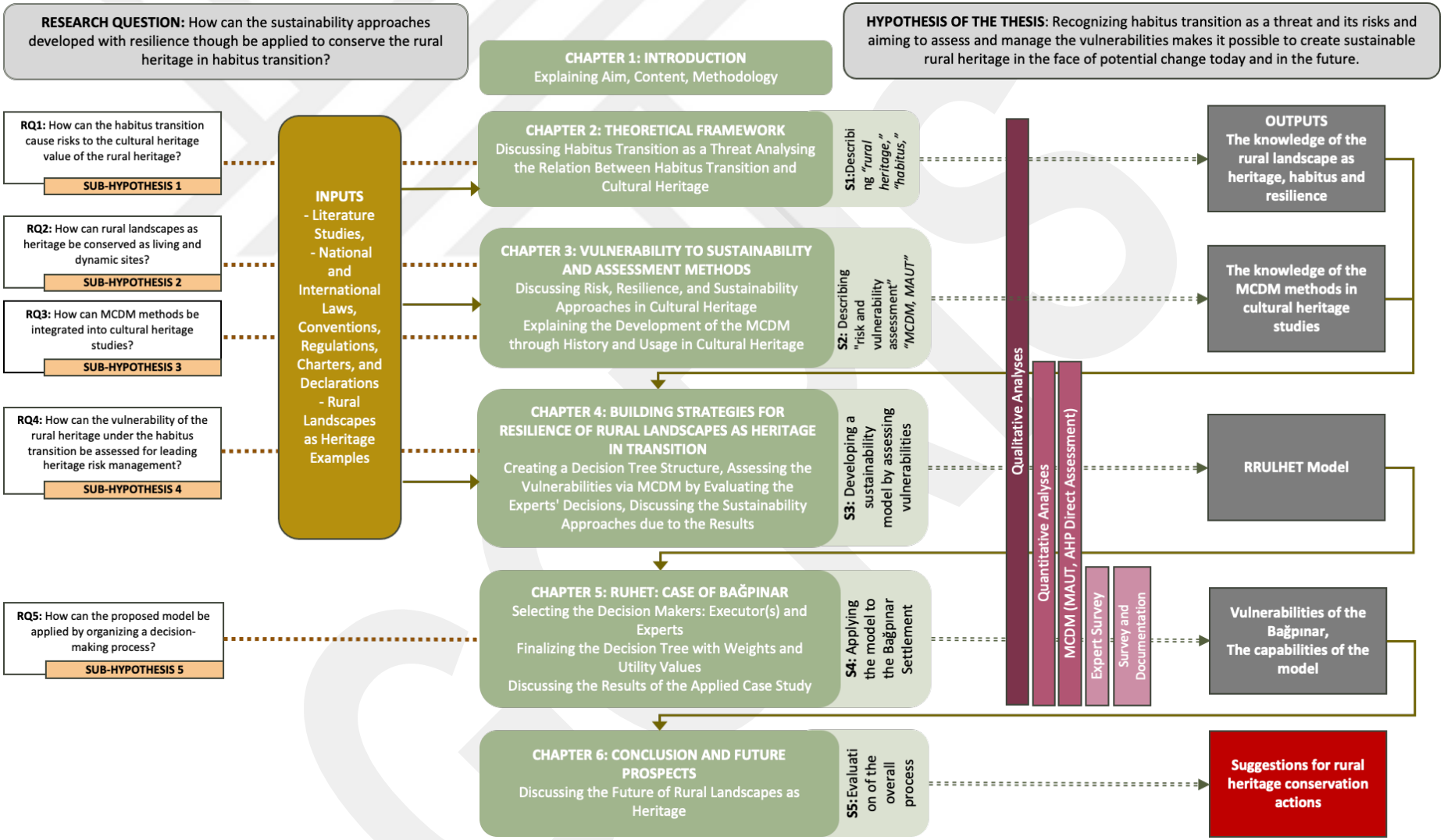


Figure 1.3 Thesis Flow Chart

Chapter 2

Habitus Transition as the Threat to Rural Landscapes as Heritage

This chapter marks the initial phase of the conceptual evaluations, focusing on the sub-hypothes outlined in the thesis: *"For various reasons, the transition of habitus, which is dynamic with the built and natural environment components, can lead to conservation problems in rural landscapes as heritage, where they mutually influence each other within an active cycle."* The comprehensive literature review encompassed various definitions, attributes, and characteristics of the given concept. The exploration involved an extensive study of different topics like "rural landscape as heritage," "habitus," and "transition" to gather insights.

To effectively manage the conservation process of rural landscapes as heritage, it's crucial to deeply examine the habitus within which heritage exists alongside heritage-focused approaches. Understanding these vernacular structures and landscapes, reflecting communities' shared memory, history, and traditions, is one of the most effective ways to comprehend the culture and its surrounding environment. As Tekeli defines, "habitus is a product of the past but ingrained in the present, indicating towards the future," suggesting its close connection to the future and inevitability of change (Tekeli, 2009). This study has demonstrated that analyzing the past and present of rural heritage areas and the components of a context shaped by daily practices and habitus can elucidate their relationships with each other.

2.1 Habitus

Rural architecture is created based on vernacular and traditional methods, utilizing local and current materials and technologies, and shaped by the socio-cultural expectations of its users, adapting to the conditions of its natural environment. Rural areas, intertwined with an organic relationship with their natural surroundings, are formed

according to the daily practices of their users. Due to this multidimensional relationship originating from human life and experience, rural landscapes as heritage reflect the tangible and intangible values that develop within their habitus, portraying the traditional way of life and construction art of societies. Cengiz Bektaş perceives traditional structures as a part of the rural settlements as direct and authentic reflections of life, classifying them as a shared domain between folklore and architecture (Bektaş, 2001).

After the modernization process in the 20th century, rural landscapes have faced a threat to their authenticity due to industrialization, rapid urbanization, and globalization. This situation significantly alters cultural elements such as family structures, social roles, and identity quickly and dramatically (Rapoport, 2006). It is aimed to seek a solution to this issue by evolving legal frameworks, research by local and international organizations, and literature studies.

Recent studies also indicate that the sustainability of traditional rural landscapes, which both shape and are shaped by folk culture, can be achieved by addressing both tangible and intangible heritage values in conservation strategies. Therefore, this study aims to underscore the significance of understanding habitus in addition to numerous existing approaches to sustainable rural heritage preservation outlined in the literature. Communities' cultural characteristics and everyday practices have shaped their built environments and settlement patterns over the years (Kuban, 2007). Understanding a society's everyday life and the built environment it creates largely depends on understanding its habitus during that period. In this context, aiming to reveal the formative influence of habitus, which acts as an environment affecting and being affected cyclically by natural, tangible, and intangible features, a conceptual discussion has been targeted to help comprehend rural lifestyles. This discussion aims to highlight the active role of habitus in shaping rural heritage areas and the sustainability of their unique life dynamics. Emphasizing the importance of utilizing habitus as a bridge, this part of the thesis suggests analyzing its relationship with all components of heritage separately before considering them as a whole.

Changing user demands lead to transformations in many intangible aspects of society, such as community folklore and socio-cultural practices. Rapoport particularly argues that cultures will change to varying degrees, posing a risk to traditional environments, especially in rapidly developing societies (Rapoport, 2006). This

discussion examines the emergence of tangible and intangible features of rural landscapes as heritage within the natural, built, and socio-cultural environment through practices. The first section will delve into the concept of habitus and its relationship with space, describing the influence of practices generated by habitus and its context in shaping space based on existing literature. The second section will focus on the place and connections of rural landscapes and heritage within the habitus-established cycle, specifically within settlements and architecture. Emphasizing the significance of all heritage components in a comprehensive and resilient preservation approach will draw from existing legal texts and literature.

2.1.1 Habitus as the Founder of Life and Practice

Before examining the spatial attitudes of the habitus, it is valuable to review the origins and development of the notion in some depth. The study considers the term habitus as delving into the practice of dwelling. Hence, understanding the historical context behind the notion of habit is crucial in grasping the concept of spatial habitus and its role within architectural spatial theory. The concept of habitus traces its origins back to Aristotle, underwent revision by Thomas Aquinas, and was sporadically and inconsistently utilized by certain 19th-century European social theorists. It experienced a resurgence when French sociologist Marcel Mauss and philosopher Maurice Merleau-Ponty employed it to understand the practical foundations of action. However, Pierre Bourdieu, a French sociologist and anthropologist, reintroduced the concept more deliberately into social theory. He positioned it as a reliable analytical instrument for elucidating the cognitive aspects of human action (Lizardo, 2013). Aristotle generated the idea of the habitus from the "*hexis"* terminology, which means *"having"* and, in essence, signifies an *"activity"* (Aristotle, 2018). It can tell the "disposition" that is acquired and trained for engaging in some specific modes of activities when
an individual faces with an object or circumstances. In addition, Thomas Aquinas, a prominent philosopher and theologian, discussed habitus within the context of virtues and character development. He viewed habitus as the acquired disposition or tendency that forms through repeated actions or practices, shaping an individual's character and influencing their behavior towards particular virtues or vices. Aquinas emphasized the role of habitus in developing moral virtues through consistent practice and behavior. Hence, habitus can be related to the collective behaviors shared within a social group.

Marcel Mauss approached habitus from a cultural perspective, defining it as the entirety of practices between individuals and society (Mauss, 1973). He highlighted habitus' social and cultural aspects, emphasizing how these shared practices shape individuals' dispositions and behaviors. This view highlights habitus as an integrated combination of personal and social level practices. Erwin Panofsky, an art historian who studied the cultural meaning of architecture, checked the "habits" and their "formation" in Gothic architecture. According to the Bourdieu explanation, Panofsky was led to recognize a concealed principle, termed *"habitus"* or *"habit-forming force,"* within the historical convergence (Bourdieu, 1990). Panofsky indeed examined firstly the concept of habitus encompasses the architectural elements and their interactions with time, location, and the community.

Bourdieu revisited these definitions and systematized them along with the concept of social class: Habitus is the generator of actions and reactions, itself being a product of the environmental conditions encountered in an individual's ontogenetic development (Lizardo, 2013). Bourdieu introduces the concept into social contexts, social classes, and their diverse ways of life by drawing from its historical origins. Unlike the notion of habitat, habitus provides a means to comprehend how individuals perceive and respond to the social and physical world around them (Bourdieu, 1977). He called it an ingrained disposition typically common among individuals with similar backgrounds, such as social class, nationality, education, profession, or religion.

He explained the habitus notion over the capital and field relationship. The idea of "field" is intimately connected to "capital" because capital's existence and functionality depend entirely on its association with a specific field (Bourdieu & Wacquant, 1992). Hillier and Rooksby explained this phenomenon in the *"Habitus, A Sense of Place"* study:

"Capital should be regarded not only as having its more usual, economic, connotation but also as having applicability to resources such as status, power, personal contacts and formal and informal forms of knowledge. Bourdieu identifies three types of capital as follows:

• Economic capital or material wealth and concomitant power.

• Social capital may be defined as the resources and power people obtain through their social networks and connections.

• *Cultural capital refers to knowledge and skills that actors acquire either through formally examined or through less formal means of education. Cultural capital often relates to prestige and status and includes resources such as articulateness, persuasiveness, aesthetic preferences, and cultural awareness."* (Hillier & Hanson, 1984).

Bourdieu starts the development of the notion by seeking an answer for the motivational sources of human actions. He reviews habitus as *"... I must first recall the definition of habitus as a system of dispositions, that is of permanent manners of being, seeing, acting and thinking, or a system of long-lasting (rather than permanent) schemes or schemata or structures of perception, conception, and action."* (Bourdieu, 1990). He defines the action motivation as disposition, which is related to the capital of the individuals. In essence, habitus emerges from the interactions between the habitus actors and their corresponding social contexts or fields due to their historical backgrounds. As a review, the concept of habitus fundamentally addresses social situations by exploring the interplay between structured activities and those activities that structure them. With this perspective, habitus allows individuals to understand their physical and social environment and respond through their practices. Erzen explains the concept: "Habitus is based on the idea that it is a residence in every aspect, everywhere, and at all times of human life. From the moment a person is born, they carve out a place for themselves and struggle for a place until they leave the world. Pierre Bourdieu suggests that before belonging to a class or group, a person primarily belongs to a place, emphasizing that the determinant factor is not social class but social space" (Erzen, 2017).

Unlike habitat, habitus emphasizes ongoing social relations within a physical and cultural environment. The personal and societal pasts of individuals significantly shape these relationships. Tekeli defines habitus as integrated, permanent, internalized predispositions resulting from an individual's or individuals' past life experiences (Tekeli, 2009). According to this perspective, individuals with similar tendencies are assumed to share a common past. Shared experiences and environmental conditions trigger common predispositions and the emergence of new spaces.

Habitus forms within the societal realm, manifesting within everyday life as defined by Bourdieu as "practices," simultaneously shaping and regulating daily activities. Those living within a specific habitus develop behavioral patterns aligned with it and enact their

practices accordingly. Bourdieu argues that individuals' ingrained behaviors and practices that evolved due to their dispositions shape the physical environment. Additionally, He examines how architects, particularly in Gothic Architecture, play a crucial role in assimilating societal habits into their designs (Bourdieu et al., 1991). This indicates that the physical environment isn't just about structures and reflects and influences social habits and practices. As a result, architecture is an objectified cultural capital, and its value can only be understood by establishing a relationship with space through social practices (Bourdieu, 1977, 1980).

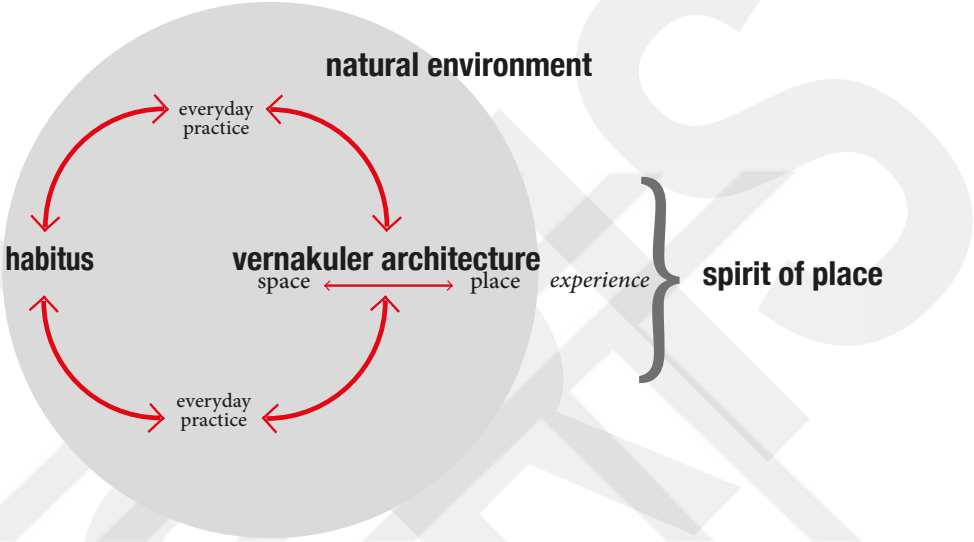


Figure 2.1 Habitus and vernacular cycle

According to the former negotiations the rural landscapes as heritage, which are the thesis scope, structures, and structuring by the habitus simultaneously. Hence, it can be inferred that through habitus, there's a creative loop between people and their living environment, producing folk architecture and integrating resulting settlements within a cycle. Social practices in this loop serve as catalysts, ensuring the system's function and continuity (Figure 2.1). Understanding the relationship between space and habitus requires elucidating the link between these practices that sustain them and the environment in which they exist.

2.1.1.1 Practices, Everyday Life and Space

Bourdieu argues that a space's value and livability can only be understood through social practices (Leach, 2016). Similar inclinations, influenced by social-cultural and environmental factors over time, shape practices that reflect a shared lifestyle. An

acquired disposition not only shapes an individual but also forms a secondary nature that is dynamic and adaptable (Thompson, 1991). In this manner, it mirrors the sociability of everyday life bodily activities. Habitus influences the physical and social environment by reshaping certain behaviors, attitudes, or perceptions due to historical accumulation (Bourdieu, 1990). Contrary to perceiving the social intentions behind the built environment as a statically designed habitat, the phenomenological dimensions of habitus unveil the interplay among the social ingenuity of individuals or social groups, the cultural context, the engaged habits, and the physical attributes of the environment. In essence, habitus delineates a dynamic structural connection between habits and ways of life, and the theoretical framework of the thesis is attributed to this circle between them (Figure 2.1).

According to Bourdieu, individuals acquire specific movements, gestures, and postures based on predispositions suitable for their social group or community. Their childhoods form the behaviors, attitudes, appreciations, and judgments according to society, social group, or class. Therefore, people can act due to spatial organizations of their environment being culturally created. These actions are organized within daily life practices, such as day/night, weekdays/weekends, workdays/holidays, etc. This organization varies between traditional, smaller settlements of the past and modern cities today. The unique practices that formed settlements in traditional areas reflecting our folklore are under threat from the modern world. Henri Lefebvre and Michel De Certeau have also discussed the interaction between everyday life practices and spaces through the lens of modern and traditional life. Lefebvre didn't separate daily life practices from modernity, believing they complement each other. He says modernity has made everyday life ordinary and unremarkable (Lefebvre, 1991). Industrialization has led to a loss of authenticity in daily life. Despite the apparent diversification and enrichment brought by modern routines, many aspects have become industrialized, inevitably leading to homogenization and ordinariness.

Traditional rural building stock away from the modern world maintains its diversity and uniqueness. Similar contemporary views revolve around the idea that daily life shapes the world's experience. Examining daily life is the most effective way to understand a community and, consequently, the world. De Certeau claims that everyday life harbors surprises and originality within its ordinariness (De Certeau, 1984). It is intriguing because it cannot be fully known. People and the environment they inhabit have

transformative effects on each other. The everyday practices defined by De Certeau as tactics and strategies transform spatial organization into a dynamic and living space (De Certeau, 1984). Similarly, Henri Lefebvre focuses on the experience of everyday life. He claims that the story of a day encompasses the story of the world and the story of society (Lefebvre, 1971). Despite alterations in architecture's physical and social facets, daily life retains conservatism. Consequently, the routines and familiar details of ordinary life, along with bodily practices, tend to persist in the behaviors of individuals or social groups (Lefebvre, 2002).

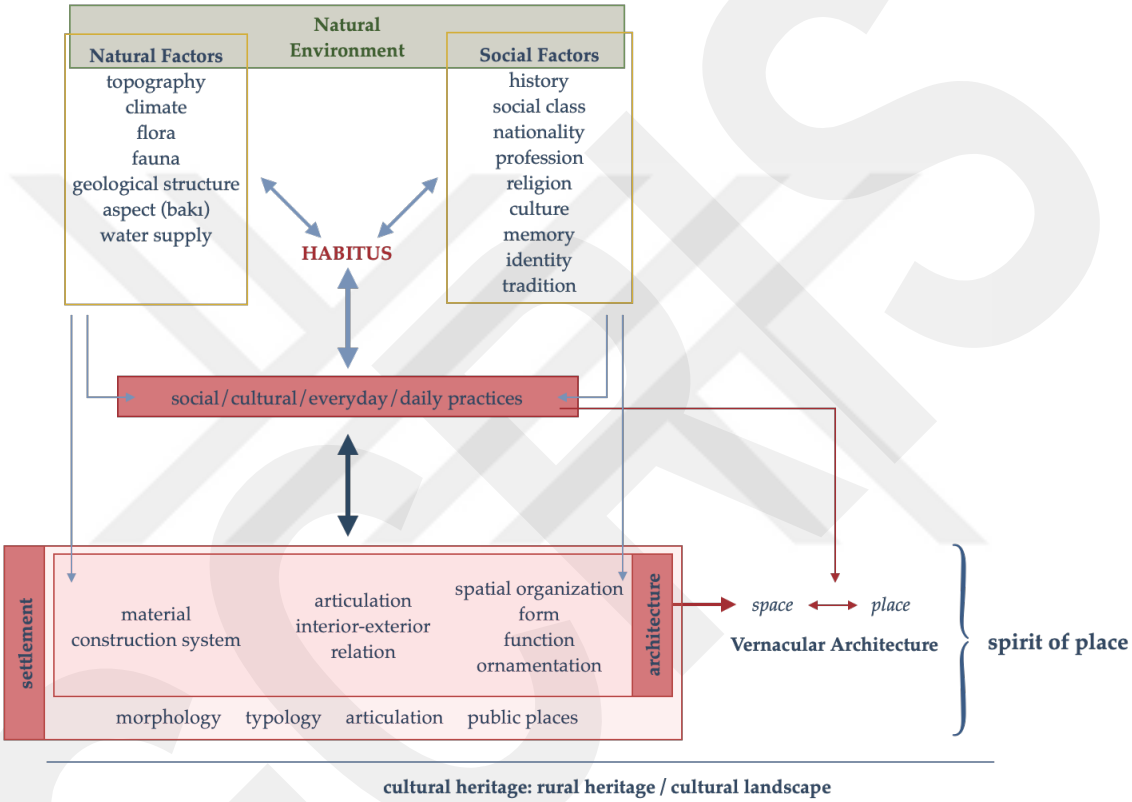


Figure 2.2 Habitus, environment and architecture cycle

The surprise within the everyday lies within its ordinariness; it's filled with uncertainties and surprises. Daily life, composed of continually repeated practices, shapes personal and societal behavioral patterns, forming shared living spaces and settlements. Despite its association with modernity and urban life today, everyday life remains a significant part of rural existence. In rural areas devoid of urban workspaces like offices, people establish tighter and more intense relationships with their dwellings and surroundings, consuming a significant portion of their time. Consequently, the spatial and rural reflections of everyday life are valuable in the traditional rural landscapes, which differ from the construct of modern life. New practices and their spaces entwined with

modern life while trying to trigger the emergence of new cultures and habitus can reduce the diversity of tangible and intangible heritage. This transition to traditional life can endanger the continuity of cultural activities born from traditional life. Intangible heritage can only persist within its context, specifically in the cultural space (UNESCO, 2003).

Like various social groups (ethnic, class, religious, regional, etc.), habitus also exhibits different characteristics and contributes to forming communities. Individuals within the same habitus tend to converge and form groups over time due to their similar dispositions. In a specific natural environment, habitus and vernacular settlements are connected in a dynamic cycle supported by everyday practices (Figure 2.1). As Bourdieu explained, habitus structures the tangible and intangible environments simultaneously while being structured by them. During the production of practices, habitus conceptually reorganizes the environment in which it emerges. Habit is both a product and a producer (Lawrence & Low, 1990). Over time, behaviors that transform into necessities under various conditions reveal different lifestyles and ensure the safe continuity of these lives. Within this cycle, dwellings and settlements take shape according to the needs of user practices. Therefore, it can be stated that within the same cycle, the intangible heritage that forms daily practices, along with environmental influences, creates tangible heritage and mutually influences each other. Ruan claims that habitus can produce a space or be a product of it. It reproduces spatial conditions, and the practice process can trigger in people the idea that inhabiting encompasses both social and physical dimensions, engaging both mind and body (Ruan, 2006). Therefore, there is an interactive connection among social groups, their surroundings, and their capacity to take action and transform their environment. The everyday practices of the individuals mainly form housings in which locals spend their lives. Similarly, the settlements are created by the everyday and social practices of the societies that share the same habitus.

According to De Certeau's theory, through our regularly repeated social movements, we develop a sense of belonging to a specific area and attribute meaning to it (De Certeau, 1984). In other words, space gains significance through human presence and activities; traditional rural architecture acts as a transitional element, a bridge between humans and nature, enveloping individuals like a shell. Humans and the environment they inhabit have transformative effects on each other within a cycle. The environment is rendered meaningful and transformed into a place through alterations made by its inhabitants (Tekeli, 2009). The significance acquired by the traditional physical and

socio-cultural environment over time has been defined by Norberg-Schulz as the 'spirit of place' by Rapoport as 'ambiance,' by Kropf as 'sense of place,' 'identity' or 'character,' and by Abada as 'cultural identity' (Karakul, 2014) (Figure 2.2). With these mentioned meanings, traditional settlements and, subsequently, rural landscapes as heritage emerge with both tangible and intangible values (Figure 2.2).

2.1.1.2 Habitus In the Interaction of Environment and Culture

Habitus reproduces the space and the conditions it exists in. The act of settlement occurs in collaboration between the mind and body, in conjunction with practices, within the social and physical processes (Ruan, 2006). Humans alter the place they live through everyday routines, resulting from their disposition. Hence, a dynamic relationship exists between social groups and physical-cultural environments. Within this complex relationship, habitus, defined as personal predispositions, is positioned as shaping the environment it originates from and being shaped by it. The environment, defined by Erzen as a 'space of encounter, sharing, and togetherness,' is the very context where Bourdieu's predispositions are formed, characterized by past and future forms. The outcome - and subsequently the input - of these environments are the rural landscapes as heritage is depicted in this study, representing our traditional way of life.

Settlements are shaped significantly by social factors, and one of the most crucial among these is culture. Tylor, in 1871, defined culture as "knowledge, beliefs, arts, laws, morals, customs, and all other capabilities and habits acquired by humans as members of society" (Rapoport, 2005). These aspects of culture give rise to different social groups, and these groups create new built environments in interaction with the environment. User groups and their behaviors are culturally bound, causing them to vary accordingly (Rapoport, 2005). Consequently, it can be said that behaviors tied to culture influence predispositions identified by Bourdieu as practices. Despite having similar resources within the same natural and physical environments, communities with different cultures can produce many settlements and architectures. The decisions made and the rules established during this production process are determined over the years by the community, becoming part of its identity (Rapoport, 2005). These rules evolve and adapt to be more compatible with users over time, considering the environment and habitus. According to Rapoport, culture shapes lifestyle and action systems within the social environment's components. Therefore, these actions identified by Bourdieu as practices,

in conjunction with habitus and other environmental factors, contribute to creating traditional living spaces.

Intangible values play a decisive role in shaping architecture. Building materials lack inherent meaning until human expertise imbues them with significance by transforming them into structures. These infused meanings are essential in transitioning from mere 'space' to a meaningful 'place' and from a simple 'structure' to a livable 'dwelling.' The cultural practices that create traditional rural landscapes can be categorized into three economic, social, and daily activities. Analyses on them involve exploring their interactions and clashes with the unique traits of physical surroundings, such as morphology, spatial characteristics within environments and buildings, spatial qualities, architectural and decorative features, furnishings, and arrangements, as well as elements like curtains (Rapoport, 1982).

Rapoport, in his studies on cultural space, suggests that to comprehend habitus and spatial relationships, it's necessary to dissect and examine each component individually and then reassess them holistically, as proposed. Understanding the connection between settlements and habitus requires delving into the physical and sociocultural environment and the factors that generate and develop them. In this study, physical factors are divided into natural and built environments. Each rural settlement is formed within a natural context, influenced by topography, vegetation, climate, livestock, geological structure, and water sources. Existing infrastructure, nearby settlements, underground and above-ground archaeological heritage sites, location, and transportation infrastructure are defined as components of the built environment.

2.1.2 Habitus for Resilient Rural Landscapes as Heritage

Traditional rural architecture and open and enclosed spaces created by it are shaped by the physical and social possibilities of the chosen environment for settlement within the framework defined by habitus and its influences. The distinguishing characteristic of rural structures is the naturalness perceived in the appearances of creatures developed within a natural evolution. Without assuming an artificial stylistic role, these structures respond to the traditional needs of pre-industrial society and the problematic constraints of place and climate (Aran, 2000). They are structures developed by ordinary people who, to sustain their physical and mental lives, adapt themselves to overcoming the challenging

constraints of nature and learn to adjust to the environment." (Aran, 2000). These rural structures, along with their users' socio-cultural accumulations and practices, create open and enclosed spaces termed traditional and vernacular rural landscapes.

Table 2.1 Table shows the relation between habitus and rural architecture

parameters		**Habitus**		
		natural factors	***location***	***Intangible factors***
Site Arrangement	***morphology***	geological structure, flora, fauna, sky and earth, wind	Aspect, slope, position, water supply	Everyday / social practice
	typology	natural sources, geological structure, sky and earth, wind	Aspect, slope, position	Everyday / social practice, Aesthetic
	articulation	geological structure, natural source, fauna	Aspect, slope	Everyday / social practice
	public places	geological structure, sky and earth	Accessibility, aspect, slope	social practice, culture, tradition, history, religion, memory
Architecture	***material***	Flora, natural sources	Position of the other sources near the settlement,	Aesthetic, culture, everyday practice
	construction system	Flora, natural sources, geological structure, natural disaster risk,	slope, position	tradition
	spatial organization	Flora, fauna, geological structure, wind, sun	slope, position, accessibility,	Everyday practice, culture, tradition
	form	Flora, natural sources, geological structure, wind, sun	slope, position	Aesthetic, culture, tradition
	function	Flora, fauna, geological structure, wind, sun	slope, position, accessibility, aspect, water supply	Everyday practice, culture, tradition, history, religion
	articulation			Everyday practice
	ornamentation			culture, tradition, history, religion, memory

Rural settlements are vibrant and dynamic spaces in direct relationships with their users and are in constant transition. Particularly, lifestyle changes alongside globalization transform societies' cultural and socio-economic characteristics, consequently altering daily life practices. These transformations manifest as new user demands across all areas of rural dwellings and settlements. Additionally, profound changes in rural landscapes have occurred due to the effects of the Industrial Revolution, resulting in population loss in rural areas and the mechanization of agriculture. While existing rural landscapes are demolished with population decline, new ones devoid of vernacular and traditional characteristics have emerged due to the impact of industrialization. Following these

significant changes and losses, debates have arisen regarding the significance of traditional rural landscapes, which are the products of societies' culture and traditions and serve as contexts for intangible heritage. In the "Granada Appeal," published in 1977, attention was drawn to these transformations, emphasizing the threat to rural architecture and environments (COE, 1977). Furthermore, it was noted that industrial society was losing its local and traditional characteristics, posing a threat to rural cultural heritage. The "Recommendation on the Safeguarding of Traditional Culture and Folklore," adopted in 1989, highlighted that folk traditions and transmission methods were under pressure from the changes in industrialized society and suggested that this transformation not only jeopardized traditional values but also necessitated the safeguarding of traditional settlements, which provide a context for their sustainability (UNESCO, 1989).

Historic rural sites, along with their traditional settlements, landscape areas, and socio-cultural features, have begun to be defined as cultural landscapes and were added to the "World Heritage Convention" by UNESCO in 1992 (UNESCO, 1972). Subsequently, various terminologies such as vernacular/traditional architectural heritage, rural architectural heritage, cultural landscape, and rural landscape have continued to be utilized in studies. The threat posed by globalization, which leads to a form of standardization, to traditional architecture as a fundamental component of cultural landscapes and thus to the cultural diversity of societies, was addressed in the 1999 ICOMOS "Charter on Built Vernacular Architecture" (ICOMOS, 1999). The charter also emphasizes that traditional architecture encompasses tangible values and intangible socio-cultural attributes and behaviors, which will be defined as intangible heritage in the "Convention for the Safeguarding of the Intangible Cultural Heritage" in 2003 (UNESCO, 2003). The rural heritage sites under study were called "rural sites" in the 2013 ICOMOS Turkey Architectural Heritage Charter. In 2017, the term "rural landscape as heritage" was developed by ICOMOS-IFLA with the most comprehensive and detailed definition, distinguishing it from cultural landscape areas (ICOMOS-IFLA, 2017).

On the other hand, as discussed above, Bourdieu's concept of habitus defines an area within the ecological environment of traditional settlements shaped by social structures, habits, and daily practices. Within this context, physical and social factors form the space described as practices and habitus. Traditional architecture and settlements are included in the equilibrium created by the guidance of practices and the defined environment. When these settlements become heritage sites, it's essential to consider

intangible cultural heritage (ICH) alongside social factors. It is transmitted between generations and can change alongside and influence the environment it interacts with, much like habitus. To understand rural landscapes, ICH should not be reduced to a subtopic but should be evaluated comprehensively along with all factors (Ölçer Özünel, 2017). The sustainability of ICH in rural landscape areas is only possible by maintaining the built heritage, practices, and habitus it is connected to (Ölçer Özünel, 2017). It is necessary to understand the dynamic balance between the environment and habitus to conserve its rural landscapes.

2.1.2.1 Rural Landscapes and Habitus

In the international texts and literature, as mentioned before, the sustainability of cultural heritage is only possible when taught in its context. In rural landscapes, traditional architectural heritage is directly linked to its natural environment, the built landscape areas, and the intangible heritage it generates. These components are valuable as they express the local community's relationship with the natural environment, production and consumption patterns, traditions, and daily life, making their transmission to future generations possible through a resilient conservation approach. The orders creating spaces in traditional and vernacular settlements gradually adapt, through local user experiences, to harmonize with the environment and people actively, whereas in modern cities, the process is rapid, influenced by different rule-makers and users (Rapoport, 2005). These orders, developed over time through experiences, are also products of habitus and, over the years, contribute to forming all the components of living rural landscapes as heritage.

Table 2.1 examines the habitus effects on traditional architecture and settlement by dividing habitus sub-features according to diagram 1. The impact of habitus on rural settlements can be understood through morphology, typology, articulation, and public spaces. As known, factors like altitude, slope, position, water sources, geological structure, vegetation, livestock, agricultural activities, wind direction, and the relationship between sky and earth directly influence the morphology, the most fundamental characteristic resulting from the formation of the settlement. However, the relationship established by societies with these environmental influences and spatial productions directly links to habitus and life practices. These kinds of decisions emerge from predispositions developed within habitus over many years. These unwritten rules in local and rural communities become part of the culture, forming the built environment

comprising open and closed spaces. Within the production cycle and the natural environment, the existing built environment also has a founding influence: location, topography, infrastructure conditions, and transportation opportunities are significant elements of this process. In light of all these influences, a social community can create and sustain its unique settlement. In an environment with various variables, it's impossible to refer to a single type; hence, a wide range of rural landscapes can emerge. For instance, different areas with similar topography features can be influenced by different users' historical layering and archaeological reserves, impacting decisions and the process.

Settlements can be established in light of existing and related layers. In rural areas, the rural landscape emerges along with the daily life and social practices that take place between open and enclosed production, socio-cultural and trade areas, housing, and transportation connections. The articulation of public spaces and the settlement occurs not only due to location and natural factors but is also influenced by social practices, culture, tradition, history, religious beliefs, and collective memory. For instance, public spaces like baths, fountains, and mills are constructed near water sources, while decisions about the location of religious spaces, squares, coffeehouses, and commercial areas being more central, and cemeteries being farther away from the center are the result of evaluating these parameters. The location and usage patterns of open production areas, such as pasture, fields, and gardens, often developed based on natural elements like climate and topography, are influenced by historical, traditional, and societal rules formed over time. The settlement typology is linked to the creation of vernacular architecture by considering the possibilities of natural resources, geology, wind, sky, and earth, alongside the effects of natural elements like inclination, aspect, and water sources, evaluated by users in conjunction with traditional knowledge. As Rapoport has conveyed, the built environment is shaped based primarily on socio-cultural data and then climate conditions, land selection, accessibility, material, and construction technology capabilities (Rapoport, 1969).

2.1.2.2 Rural Architecture and Habitus

A dwelling is a cultural object that reflects the collective culture and memories of those involved (the builders, users, and locals), especially in traditional cases. These dwellings, where most everyday practices are realized, have cultural values for individuals interacting with them. These dwelling spaces and lifestyles, carrying

collective values for these individuals, are interrelated in a cycle. Under the same culture and living conditions, structures produced in harmony with the climate and nature within rural settings are constructed similarly within a common typology. Most of the time, rural landscapes as heritage are created with natural materials in a simple, straightforward manner while considering traditional preferences and aesthetic values. The balance established by the rural structure with habitus can be described under headings such as material, construction system, spatial organization, form, function, articulation, and ornamentation (Figure 2.2). Therefore, building, which is humanity's way of relating to and intervening in nature, is a product of nature in rural and traditional life because the structures are built entirely with local materials. As much as the material selection, the choices and usage habits of the spaces are determined by the rules they were born and raised within a specific habitus. Thus, choices regarding materials, construction systems, and structural features like form are directly related to dispositions of the society, in other words, habitus.

Everyday practices have a significant impact on the formation process of a structure. Users' actions, primarily articulation, are among the most critical factors in forming form and plan organization. Producing a structure that meets the user's needs with natural components has been an acquisition challenged by rural people for many years. In his studies, Malinowski examined space through user needs tied to culture and emphasized that culture effectively determines the functions of space. In addition, traditional villages or towns often reflect communities' shared goals and values more than individual persons (Karakul, 2007; Malinowski, 1944; Rapoport, 1969).

Just as space determines the social environment, social activities also shape space. Social space tends to transform into physical space (Bourdieu, 2000). Spaces personalized by habitus's social environments or social activities (such as the kitchen, bedroom, storage, barn, etc.) and building groups (such as oven, mill, coffeehouse, etc.) emerge. These spatial organizations eventually lead to social activities. Hillier has addressed this issue in his theory called the "social logic of space" (Hillier and Hanson, 1984). Thus, a transformative effect emerges between ICH and the heritage structure it exists within. Sometimes, with the change in ICH - such as the end of the tradition of baking together leading to the demolition of communal ovens - we can observe the disappearance of a space or structure. In some cases, the failure to preserve an existing space, as seen when a fountain loses its function and is demolished, leading to the end of activities around it,

may cause the loss of ICH. This situation can be linked to habitus's constantly evolving and living structure. The transformation, managed correctly, leads to the resilient existence of cultural landscapes, whereas uncontrolled change can have destructive consequences for heritage.

2.2 Chapter Review

Intertwined with the social and daily practices of locals and their environment, the rural landscape encounters obstacles in safeguarding its diverse cultural and natural heritage, notably from alterations or vanishings. This emphasizes the crucial need to implement protective steps for preserving this invaluable cultural and natural legacy. Inadequate measures and an undefined management strategy suggest an inevitable loss of rural cultural heritage amidst changes in the natural setting, constructions, and socio-cultural aspects, underscoring the urgency for action. In this chapter of the dissertation, it is questioned: “How can the habitus transition cause risks to the cultural heritage value of the rural landscapes as heritage?”.

This part aimed to elucidate the formative influence of habitus on rural landscape heritage to comprehend rural heritage sites better and contribute to developing comprehensive conservation approaches. It delved into how practices engendered by habitus, a product of the natural, built, and socio-cultural environment, shape structures within this system balance, analyzing the genesis of rural heritage areas from rural settlements. These interconnected concepts, bound in a symbiotic equilibrium, exert a transformative effect on each other. Habitus, an element formed over time and a part of history, remains in a constant state but is never static and remains open to change (Bourdieu & Wacquant, 1992). It adapts the constructed environment it shapes over time to evolving changes, which can pose challenges in areas such as spatial organization, circulation, privacy, standards, materials, form, and meaning (Rapoport, 2006). These shifts might result in the complete elimination of habitus. In such cases, the relationship between individuals and their environment is disrupted. The built environment in these contexts either gets entirely abandoned or is used by a different habitus. The new cultural practices introduced by this new habitus cause alterations in the built environment, while the historical context of the settlement brings about preservation issues. Understanding

the natural, tangible, and intangible components of rural heritage areas and their interconnections is only achievable by understanding the influence of habitus on them.

In a developing world, it should be acknowledged that change is inevitable, so solutions that maintain the balance between culture and space must be provided for heritage sites (Rapoport, 2006). Rural landscape areas, as dynamic heritage sites, can only be sustained through comprehensive management strategies that safeguard their tangible and intangible values, responding to the new physical, cultural, and socio-economic needs of their users. As explained in the chapter, the resilience approach, with its live structure and prospects via adaptation and removing vulnerabilities, is the appropriate method for the rural landscape as heritage in transition.

Chapter 3

Vulnerability to Sustainability and Assessment Methods

The "Stage 3: Theoretical frameworks of the cultural heritage and risk studies and assessment methods" phase of the study involves a model for establishing resilience for the rural landscapes as heritages by decreasing vulnerabilities against the consequences of the habitus change. The chapter addresses the sub-hypothesis *"Sustainability which is expanded with the resilience can be the most convincing approach with its dynamic structure on the living rural heritage under the transition threat.*" and *"As the complex systems, rural landscape as heritage, which encompasses various dimensions, including socio-cultural, economic, ecological, and architectural considerations, should be assessed with MCDM, which is comprehensive and complex."*. Tries to answer the research questions: "*How can rural landscapes as heritage be conserved as living and dynamic sites?*" and *"How can MCDM methods can be integrated to cultural heritage?"*.

The chapter starts with sustainability, resilience, and emerging terms related to its developments. After the risk and cultural heritage conservation issues were discussed, a sustainable heritage risk management considering the resilience approaches was examined for the creating of a sustainability model for rural heritage in transition. The chapter's second part explains the MCDM's development throughout history. The types of methods, main features of the variations, and their usage fields are examined. As one of the fields it used, cultural heritage studies were analyzed according to their usage of MCDM methods. The decision-maker features and application of the MCDM are explained comprehensively. According to the literature studies, the appropriate methods for the vulnerability assessment of the rural landscape as heritage are determined and investigated.

3.1 Theoretical Framework

The social, ecological, and built environment transition is inevitable in the developing world. As elaborated in Chapter 2, these challenges drastically transform the habitus, mainly the rural landscapes as heritage. Once vibrant and evolving environments, vernacular rural settlements are closely tied to their inhabitants and habitus and can undergo significant changes. Specifically, globalization-induced lifestyle shifts are drastically reshaping cultural and socio-economic aspects of societies, leading to altered everyday routines and new expectations from users across various aspects of rural homes and communities. The rural landscape, deeply intertwined with local social customs and daily life, is threatened by societal changes that risk erasing its rich cultural and natural heritage. This highlights the urgent need for protective measures to safeguard this invaluable cultural and natural heritage. Therefore, The RUHET model is developed for the sustainability of rural heritages by relying on vulnerability and capacity terms. The model aims to promote the change-resilient rural landscape as heritage by measuring vulnerabilities and enhancing coping and adaptive capacity. The first part of the thesis explains the related terminology of the RUHET, starting from its development and continuing with their usage in the cultural heritage literature.

3.1.1 Development of the Sustainability Together Resilience Terminology

To develop more effective mitigation strategies and establish suitable conservation and restoration efforts that minimize vulnerabilities and strengthen overall capacity, safeguarding cultural heritage structures must rely on a thorough understanding of risks (Ferreira et al., 2021). Therefore, the resilience of the cultural heritage could only be planned by identifying the risks. The sustainable preservation of cultural heritage with tangible and intangible aspects has been a subject of long-standing discussion in the literature, primarily led by international organizations like UNESCO, ICOMOS, and COE. The risks, the most significant challenges facing sustainable preservation, were highlighted by UNESCO in 1972 through the Heritage in Danger platform and by ICOMOS in 1999 with the creation of the Heritage@Risk platform. UNESCO (2019) categorizes risks for cultural and natural heritage areas into existing and potential risks, whereas ICOMOS (2000) classifies risks primarily based on natural, societal, and

economic factors related to nature, development, societal and collective behaviors, and inadequate conservation policies (ICOMOS, 2000; UNESCO, 2019). Risks are commonly classified as natural and human-induced (Baer, 1991). UNESCO (2010) rejects a strict binary categorization of risks and advocates that some natural disasters might have human-induced origins; accordingly, risks are grouped into three categories: natural, human-induced, and indirect/secondary (UNESCO et al., 2010). Baer (1991) and Sharifi (2019), as a secondary classification approach, categorize risks as sudden (earthquakes, floods, fires, wars, etc.) and cumulative, which are gradually occurring over time (biological erosion, global warming, oxidation, etc.) (Baer, 1991; Sharifi, 2017). Understanding and categorizing factors that threaten heritage is crucial for determining necessary measures.

This model aims to generate a sustainability model by enriching it with resilience approaches for the rural heritage in transition risks due to the aforesaid threat. Before developing strategies for a heritage site, it is critical to understand the nature of the threat and conservation approaches: sustainability and resilience. Sustainability refers to the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs. It involves making decisions and taking actions considering the long-term impact on the environment, society, and economy, aiming for a balance between these three pillars of sustainability. The term has even been used for ecology debates; in the 1990s, the term discussed ecology, economy, and social base. Sustainability requires a balanced approach to addressing these three dimensions and acting with a long-term perspective. This entails collaboration among various stakeholders and their involvement in decision-making processes to achieve a balance between the present and future generations. The sustainability studies against the risk of cultural heritage started to be upgraded with resilience approaches. The increased usage of the concepts of resilience and sustainability in recent years has led to various perspectives emerging to understand the relationship between the two. Sustainability, a term dating back to the 17th century, and resilience, a more contemporary concept arising from the needs of the current Anthropocene era, may appear to share a common language but possess differences at their core (Yaman Galantini & Tezer, 2018).

Alexander (2013) discusses in his article "Resilience and Disaster Risk Reduction: An Etymological Journey" how the concept evolved from its initial dictionary definitions and mechanical origins to its sequential usage in ecology, psychology, social sciences,

and sustainability fields. In the same work, he mentions that resilience studies emerged following two major earthquakes in Japan in 1854, gaining traction across various fields starting around 1950 and becoming popular in psychology by 1980.

Similarly, sustainability resilience studies have evolved with Holling's ecosystem-based theories (Holling, 1973, 1989, 1995). Holling defines resilience as an ecosystem's resistance capacity, explaining it as the ability to decrease a disturbance of a controllable magnitude by altering the variables and processes that control the threat without disrupting its structure. In certain areas, resilience has explicitly been employed to denote the speed of returning to a balanced state after a disturbance. Some researchers perceive resilience as rebounding or recovering after a disturbance, implying a return to the previous state. This viewpoint often implicitly emphasizes resisting change and exerting control to uphold stability (Folke, 2016).

Adger introduces the concept of social resilience, asserting that the resilience of communities sharing the same ecosystem can support ecological and economic resilience (W. N. Adger, 2000). Folke presents a comprehensive perspective, describing resilience in socio-ecological systems, combining the "social" covering all human interventions and the "ecological" encompassing all living beings (Folke, 2006). In contrast to predecessors' approaches, particularly for complex systems, Folke argues that instead of remaining unchanged against risks, systems should demonstrate characteristics such as adaptability, transformability, learning, renewal, sustainability, and reorganization. In the context of multi-layered complex systems, including cities and heritage areas, the crucial factors enabling adaptation to change are social capital and collective memory, guiding society and systems through phases of adaptation, transformation, change, and development. Holling and Folke advocate that resilience, which relies on humans and nature, should adapt dynamically to change, similar to their adaptive nature (Folke, 2016; Holling, 2001). Ahern addresses this matter through the term's relationship with continuity, viewing resilience as a solution that disrupts the static state of sustainability (Ahern, 2011). According to Ahern, the concept of sustainability could also be reshaped according to the dynamism of the present era.

The discussions about the concepts of risk, vulnerability, resilience, and adaptation, along with their similarities and contrasts, have notably increased in research endeavors, particularly in the 21st century, aiming to address the social, ecological, and cultural

hazards and sustainability issues the world currently faces. The escalating climate-related challenges have prompted numerous researchers to discuss climate risk assessment and mitigation strategies using these concepts (Birkman, 2006; Cutter et al., 2008; Wisner et al., 2004; Zhou et al., 2010). In its 2001 and 2007 reports, the Intergovernmental Panel on Climate Change (IPCC) defined vulnerability as the susceptibility of a system to the harmful effects of climate change and extreme climatic events (IPCC, 2001, 2007). UNISDR, in its 2009 report, defined vulnerability as the characteristics of a system, community, or entity that expose it to the harmful effects of a potential hazard, signifying a vulnerability gap (UNISDR, 2009). Similar to the resilience concept, over the past 25 years, various definitions have been developed for vulnerability to be used in social, ecological, and socio-ecological domains (W. Neil Adger, 2006; Birkman, 2006; Cutter et al., 2003; Downing et al., 1997; Han, 2011; IPCC, 2001; Kasperson & Kasperson, 2001, 2005; Lei et al., 2014; UNISDR, 2009; Wisner et al., 2004; Zhou et al., 2010). Vulnerability, risk, and resilience in balance involve the features developed by the system and the changes it undergoes, defined as adaptation. Across different research fields, this definition has been reconfigured based on resilience and vulnerability concepts (W. Neil Adger, 2006; W. Neil Adger et al., 2003; Brooks, 2003; Burton et al., 1978; Folke et al., 2010; IPCC, 2012a; Lei et al., 2014; McLaughlin, 2011; Smith, 1996; UNISDR, 2009; Walker et al., 2004; Young et al., 2006). The past quarter-century has witnessed the emergence of numerous resilience, vulnerability, and adaptation approaches due to the escalating natural and human-induced risks, subsequently resulting in sustainability issues.

The increased use of resilience in urban, rural, and societal contexts, along with evolving approaches to cultural heritage preservation over the years, has led to debates surrounding the resilience of heritage sites. Various organizations have been established to reduce risks, cope with natural disasters, and promote resilience. One of the most significant is the "Resilience Alliance," founded in 1999, which focuses on understanding and implementing resilience, society, and ecosystem adaptation and transformation in the face of disasters. That same year, the "United Nations Office for Disaster Risk Reduction" (UNDRR), a UN-affiliated organization, was established to reduce disaster risks and promote resilience worldwide. One of its pivotal efforts was the 2005 Japan conference (UN World Conference on Disaster Reduction) and the subsequent publication of the "Hyogo Framework for Action 2005-2015," outlining strategic and systematic

approaches to disaster risk reduction and emphasizing the importance of social resilience (UN/ISDR, 2005). For the first time, the conference addressed cultural heritage and highlighted the use of heritage and traditional knowledge in fostering social resilience. Following this conference and the Hyogo Framework, UNESCO formulated strategies in 2007 for reducing risks at World Heritage Sites ("Strategy for Reducing Risks at World Heritage Properties") after a second conference organized by ICROMM in 2006 (Ravankhah et al., 2017; UNESCO, 2007). These strategies aim to develop methods for reducing disaster risks for World Heritage through universal and regional support while also aiming to enhance the positive effects of cultural heritage in reducing the likelihood of disasters (UNESCO, 2007). Following the conference organized by UNISDR and Venice local authorities in 2012: "Building Cities Resilience to Disasters: Protecting Cultural Heritage and Adapting to Climate Change, March 19-29, 2012", "the Venice Declaration on Building Resilience at the Local Level towards Protected Cultural Heritage and Climate Change Adaptation Strategies," supported by UNESCO, was published (UNISDR, 2012). This declaration, akin to its predecessor studies, focuses on the role of cultural heritage in creating resilient communities and addresses concerns about reducing disaster risks by including cultural heritage sites (UNISDR, 2012). Following the declaration, the importance of preserving cultural heritage in the face of disasters and ensuring social resilience was again emphasized in a resulting text published after a conference held in Geneva, Switzerland, in 2013 in collaboration between ICOMOS and ICORP. The text highlights the necessity of safeguarding cultural heritage from natural or human-made disasters and the processes that occur in the aftermath of disasters, emphasizing the need for resilience (UNESCO et al., 2013). The book titled "Heritage and Resilience," published after this conference and formulated in light of the Hyogo Framework decisions, explains how the perception of heritage has evolved, transitioning from the necessity of preserving objects with historical value to the understanding of maintaining living spaces, daily life, natural, and intangible heritage for the sustainability and resilience of heritage. Primarily focusing on risks such as disasters, conflicts, and climate change, the book addresses how heritage can attain resilience and be sustainably preserved through exemplified studies (UNESCO et al., 2013). The United Nations published the "Sustainable Development Goals," comprising 17 articles, in 2015, valid until 2030, following the integration of resilience, disaster risk reduction, and sustainability into the future theme of the United Nations in 2012 (Ravankhah et al., 2017). These goals aimed for an all-encompassing, resilient, and sustainable world. The

eleventh article specifically outlined objectives for rendering urban systems resilient and sustainable amidst various threats. The fourth section of the same article emphasized the need to increase efforts in safeguarding natural and cultural heritage sites (UN, 2015). In line with the defined development goals, the United Nations organized its third conference in 2015, releasing the Sendai Framework, valid for 15 years, focused on reducing risks. This ongoing framework underscored the necessity of mitigating risks to cultural heritage and ensuring its preservation.

The relationship between sustainability and resilience is closely intertwined, as both concepts aim to ensure the long-term well-being and viability of systems, whether they are environmental, social, or economic. Sustainability focuses on the ability to meet present needs without compromising the ability of future generations to meet their own needs, while resilience emphasizes the capacity to withstand and recover from shocks, disturbances, or changes. While sustainability, which still holds significance, focuses on preserving what exists, resilience is based on adapting to change and ensuring the system continues to adapt (Folke, 2016). While maintaining a common underlying nature, their differences present opportunities to address a wide range of systems confronting unique and diverse threats and risks. Sustainability offers longer-term and slower-progressing approaches against more cumulative threats, while resilience adopts the approach of adapting to protect the system against suddenly emerging threats. However, some complex systems may encompass many of these threats and risks simultaneously, requiring more comprehensive management approaches. Ahern views resilience as a solution that disrupts the static nature of sustainability, suggesting that the concept of sustainability could also be reconfigured according to the dynamism of our present era (Ahern, 2011). Together, they can form a holistic approach to managing complex systems and promoting their stability and longevity.

3.1.2 Cultural Heritage Conservation: Risk and Vulnerability

Resilience represents a system's ability to absorb disruption, restructure, and maintain its core function, structure, and interactions amidst change, allowing it to preserve its identity. It's essentially the capability to adapt and sustain identity through change—a dynamic notion centered on persistence through change (Folke et al., 2010; Walker et al., 2004), emphasizing the evolution alongside change (Folke, 2016).

Table 3.1 Risk assessment formulation and vulnerability meaning of selected literature.

Source	Title of the Study	Risk Assessment Formulation	Vulnerability Meaning
(UNDP, 2004)	A Global Report: Reducing Disaster Risk a Challenge for Development	hazard x vulnerability	susceptibility, coping and adaptive capacity
(UN/ISDR, 2004)	Living With Risk	probability x consequence	susceptibility and capacity
(ADSR, 2005)	Total Disaster Risk Management	hazard x exposure x vulnerability	susceptibility
(Samuels et al., 2005)	FLOODsite Project Report	probability x consequence *consequence: exposure x vulnerability*	susceptibility and value of elements at risk
(ISO 31000, 2009)	Risk management — Principles and guidelines	probability (likelihood) x consequence	-
(WHO, 2009)	VRAM Platform	$\frac{\text{hazard x vulnerability}}{\text{capacity}}$	susceptibility
(UNISDR, 2012)	A Handbook For Local Government Leaders	$\frac{\text{hazard x vulnerability x exposure}}{\text{resilience or coping capacity}}$	susceptibility
(IPCC, 2014)	Climate Change 2014	hazard x exposure x vulnerability	susceptibility (sensitivity) and lack of capacity
(UNU, 2014)	WorldRiskReport 2014	exposure x vulnerability	$\frac{\text{susceptibility}}{\text{coping and adaptive capacity}}$

Risk is one of the most related terminologies to sustainability and resilience. Cultural heritage resilience studies have emerged due to heritage risk reduction research. UN/ISDR defines risk as "The combination of the probability of an event and its negative consequences." (UNISDR, 2009). Several institutions, international texts, working groups, and projects were realized for heritage risk reduction and mitigation (Table 3.1). Every institution and field of study formulates its definitions of risk, and it is essential to analyze their explanations of vulnerability to understand these definitions fully. This process enables us to grasp the nuances and context-specific interpretations of risk within different disciplines and organizational frameworks. Several equations are created to evaluate the risk, and some models are created for the different hazards to the cultural heritage. UNDP explains the risk as the likelihood of adverse outcomes, such as loss of life, injuries, damage to property, livelihoods, economic disruptions, or environmental harm, arising from the interplay between natural or human-induced hazards and conditions of vulnerability. They quantified the risk using the function of hazard and

vulnerability by defining vulnerability as directly proportional to susceptibility and inversely proportional to coping and adaptive capacity (UNDP, 2004).

The UN/ISDR, the FLOODsite Project, and ISO 31000 standards characterize risk as a function of probability and consequences. However, they diverge in their vulnerability descriptions, presenting various interpretations and perspectives. Despite offering similar definitions of risk, the distinctions in their vulnerability approaches underscore nuanced differences in their methodologies and analytical frameworks (Table 3.1).

Firstly, the WHO emphasizes the capacity criteria for risk assessment at the VRAM Platform (WHO, 2009). Combining all the capabilities and resources present within a community, society, or organization can diminish the extent of risk or the impact of a disaster. Capacity encompasses physical, institutional, social, or economic resources and skilled individual or collective attributes such as leadership and management abilities. Capacity may also be referred to as capability (UN/ISDR, 2004). WHO declares the role of enhancing the manageability and capacity development for the decreasing risk of the systems. A refined conceptual model needs to underscore the significance of capacity as a crucial element in the formula for disaster risk, incorporating vulnerability and capacity into instruments like risk indices. Initiatives such as UNDP's Global Risk Vulnerability Index and ISDR's framework for advancing disaster risk reduction exemplify timely endeavors aimed at achieving this goal. In recent years, risk assessment studies have prioritized vulnerability even if they refer to various meanings (IPCC, 2014; UNISDR, 2012; UNU, 2014; WHO, 2009). IPCC AR5 framework defines risk as the functions of hazard, exposure, and vulnerability, which formulate the sensitivity and lack of coping capacity (IPCC, 2014). WorldRiskIndex Report lists the assessment indicators as exposure, susceptibility, coping, and adaptive capacity (Table 3.1).

Vulnerability is a critical factor in risk and resilience studies, as understood by the above definition and equations. UNDP and UN/ISDR created their vulnerability definition in 2004 as: "*a human condition or process resulting from physical, social, economic and environmental factors, which determine the likelihood and scale of damage from the impact of a given hazard.*" and "*The conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards."* (UN/ISDR, 2004; UNDP, 2004). Birkman

formulates it as; *Vulnerability = susceptibility (sensitivity) x lack of coping capacity (lack of adaptability)* (Birkman, 2006).

Also, he insisted that especially with an enhanced comprehension of the dynamic aspect of vulnerability and a comprehensive evaluation, it is beneficial to distinguish vulnerabilities (or shortcomings, sensitivities, etc.) from resources that augment the abilities of communities or social-ecological systems to manage shocks and transformations, like coping and adaptive capacities. While a precise differentiation between coping and adaptation may be challenging in certain instances, conceptually, it is valuable to recognize the distinct nature of response processes (Birkman, 2006).

Recent studies developed several thoughts about the relationship between vulnerability and resilience. Unlike vulnerability, resilience underscores that stressors and crises in social-ecological systems offer opportunities for change and innovation. Consequently, crises and destabilization processes are viewed as significant catalysts for renewal and learning, and anthropological investigations into community studies have particularly concentrated on the apparent paradox of continuity and change (Birkman, 2006). Vulnerability poses a challenge to the development of effective governance. In response to this challenge, there is a need to design governance structures that prioritize resilience, reduce exclusion, and address the perceived severity of the vulnerability and its root causes (Folke, 2016). Vulnerability refers to an inherent quality within a system that exposes it to potential harm from hazards, aiding in readiness for such events. Resilience encompasses the capacity to withstand, absorb, adjust, and recuperate from hazard impacts promptly and effectively, typically reacting to ongoing disasters. Conversely, adaptation primarily acts proactively, anticipating hazards and aiming to mitigate potential risks or adverse effects (Lei et al., 2014).

Consequently, according to the former studies and reports, the risk assessment indicators cover the following;

- *hazard*; a potential source of harm, danger, or adverse event,
- *exposure*: entities being exposed to impacts of hazards,
- *susceptibility*: The probability of encountering damage, loss, and disturbance,
- *coping capacity*: measures and abilities that are readily at hand to mitigate harm and minimize damages,

- *adaptive capacity*: strategies to manage and reduce the adverse effects over time and in the future.

Although vulnerability definitions universally encompass susceptibilities or sensitivities, in alignment with Birkman, specific definitions also incorporate capacity-related factors. Upper definitions also prove that capacity, in other words, manageability, which defines managerial and operational capabilities to reduce vulnerability, thus has a significant impact on reducing risk. Recognizing vulnerability as a critical component in the risk equation has increased interest in linking people's positive capacities to cope with, withstand, and recover from the effects of hazards. As a result, it can be claimed that the vulnerability covers as;

- susceptibility,
- coping capacity,
- and adaptive capacity.

Vulnerability, sustainability, and resilience are closely linked, with vulnerability highlighting weaknesses and susceptibilities and resilience and sustainability focusing on the capacity to bounce back, adapt, and continue to live. Strategies to address vulnerability often contribute to building sustainability and vice versa, especially when managing risks and uncertainties. The RUHET consisted of the assessment of vulnerabilities of the rural landscapes as heritages for developing resilience strategies against the habitus transition. It aims to establish sustainability by decreasing susceptibilities and increasing the coping and adaptive capacity of the rural heritage.

3.2 Multi-Criteria Decision Making

Complex problems include sub-problems, questions, or criteria, and it is hard to directly control and solve these sub-titles with a holistic approach to the human mind. Decisions can be defined as comparing different attitudes, like calculating pros and cons. This means decisions have a plurality in their nature, although for many years, they have been assumed and defined as a single criterion (Figueira et al., 2005). Optimal decision-making in complex problems has always been a problem for humanity. Today, with the development of science, like statistics, management, and computer programming, problems have started to be solved with multi-criteria decision-making (MCDM)

approaches (Triantaphyllou, 2000). However, studies on making more analytical decisions are still a goal to achieve. Every decision-making method can handle different types of problems. Even though the MCDM methods have profound differences, they have common aspects (Triantaphyllou, 2000). The wide range of MCDM methods can be disadvantageous, creating a debate on choosing the appropriate one. It is hard to choose one "best" or "right" approach, a school, or one method of MCDM because various methods are developed for different problems (Larichev, 1999). Although the MCDM methods, approaches, and techniques vary, they have the same simple 3 components: a set of actions, criteria, and decision-makers (Figueira et al., 2005). MCDM methods aim to help the decision-maker with individual and personal decisions. They are not led to decision makers for the same decisions but have been developed to get compromise answers (Ishizaka & Nemery, 2013). MCDM tends to create more objective decisions using the same steps and techniques; however, each decision-maker decides in subjectivity.

These methods can use numerical values and calculations to criticize discrete decisions. Alternatives can be turned into decisions by using calculations in three steps: figuring out related criteria and sub-criteria, assigning the weights according to the relative importance of the criteria, evaluating the results, and ranking the alternatives (Triantaphyllou & Sánchez, 1997). Methods can be classified according to their type of data: deterministic, stochastic, and fuzzy, according to the number of decision-makers single and group decisions (Triantaphyllou, 2000), the purpose of usage; choosing, sorting, ranking, and description (Figueira et al., 2005; Ishizaka & Nemery, 2013) type of the value; quantitative and qualitative (Taherdoost & Madanchian, 2023) and aggregation type; outranking relations, utility functions, discriminant functions, function free models (Zopounidis & Doumpos, 2002). Choice problems aim to select a single alternative or eliminate some alternatives, sorting problems aim to group alternative under similar characteristics, ranking problems aims to order by scores of alternatives, and description problems deals with the definition of options and results (Ishizaka & Nemery, 2013). Outranking approaches focus on the incomparability of the criteria and offer solutions for ranking or choosing the best according to the outranking score. At the same time, utility functions help to sort by using the utility of criteria (Taherdoost & Madanchian, 2023). The most popular outranking methods are ELECTRE, PROMETHEE, QUALIFLEX, and REGIME, and utility methods are MAUT, UTA, AHP, ANP, and MACHBETH.

3.2.1 Selection of Decision Maker(s)

A decision problem puts humans as the decision maker (DM) or an expert at the center of the process. That is why personal behaviors are fundamental issues of the MCDM methods. Every decision process includes the decision maker's inherent unpredictable preferences, so decision-making methods developed some procedures for collecting information step by step (Larichev, 1999). The human mind has some limitations on information processing, so methods need to be established according to these. By reason of the limits of working memory, they behave for simplifying the criteria by classifying or eliminating (Larichev, 1999). Generally, it is hard to make quite correct quantitative measurements for humans, and they can neglect more minor differences from the criteria (Larichev, 1999). Therefore, in the creation or selection process of the MCDM method, decision-maker behavior should be considered. Also, it is not ignored that human errors and contradictions can be inevitable by their nature (Larichev, 1999). DM needs time to understand and comprehend the method by trying and making errors. Consequently, to improve the DM's performance, they can be educated about how to make decisions with MCDM methods, and after decisions, sensitivity analyses can be used (Larichev, 1999). DM needs details of the decision problem and its influence on society or related areas. When DM makes a decision, s/he has to be sure about preferences and should answer the reasons for the selections.

Besides the needs of the decision problem, the MCDM method should be selected according to the features of the decision-makers. Each decision-maker has individual characteristics due to their own family, society, environment, talent, or education, so they can decide and choose instinctively. Separately from personal decisions, decision problems need people who have a profession on a particular issue. To belong to a profession, a decision maker should have the ability and knowledge on the problem topic, power on the expert's society, be able to practice independently, be exclusive on a specific skill, have undergone a prolonged period of training, and be a part of a professional organization (Armstrong et al., 1999). The decision maker can affect society according to the characteristics and impact area of a problem, so they should be aware of this responsibly (Armstrong et al., 1999). This responsibility increases incrementally when the decision depends on one decision maker's assessment.

As mentioned above, individual decisions can be open to contradictions due to human beings. Therefore, collective decision-making can be preferred for less subjective results. Grünig and Kühn claim that business companies have a tendency toward collective decision-making, and they try to incorporate all related departments into the decision-making process (Grünig & Kühn, 2005). Collective decisions need a working group that three to twenty decision makers can form, and this working group can focus on all or semi-parts of the model according to their working interests (Grünig & Kühn, 2005). Due to the nature of group studies, collective decision-making can be more problematic and long-term. It is hard to involve multiple experts in one joint problem as every person has their points of view and solution for a problem (Matsatsinis & Samaras, 2001). Conflicts between group members affect decision processes and results unexpectedly at the outset. MCDM offers discussions and one concerted result for each step of the decision while each method developed some other alternatives to disagreements possibilities (Chelst & Canbolat, 2011). In-sort group members can be located in different locations while conscious of being in a decision group and each other (DeSanctis & Gallupe, 1987). The number of group members can be a distinctive feature of the discussion approach selection in crowded groups, making consensus and deciding together harder to achieve than in a smaller group. In this situation, larger groups can control the remote, and smaller groups can prefer to discuss face-to-face. Although MCDM methods offer one joint decision realized in the face-to-face meeting, some cases need to be decided alone, like problem decision-makers needing creative solutions (DeSanctis & Gallupe, 1987). The latter explanation shows that every unique problem comes with particular questions, and no one explanation, method, or decision-maker can answer it. Due to the characteristics of the decision problem, a method should be selected first, and then appropriate approaches should be developed according to the number of decision-makers.

3.2.2 MCDM in Heritage Studies

Cultural Heritage has multi-dimensions, which include sociocultural, economic, ecologic, and architectural concerns. These complexities can arise, especially for living cultural and natural heritage sites. The sustainability and management questions of cultural heritage can only be answered and solved by consensus between inhabitants, locals, governments, and experts on socio-cultural, economic, and ecological concerns. As multilayered systems, cultural heritages require more objective and systematic

decision-making approaches. The multi-criteria decision-making (MCDM) process is a critical scientific approach utilized by specialists to select the optimal solution, categorize alternatives, or rank alternatives in order of preference in a highly effective and efficient manner (Mardani et al., 2015). The techniques organize and answer decision-making issues with various factors to consider. MCDM methods are extensively used and presently employed in numerous engineering, planning, and management fields, including energy, environment, sustainability, tourism, and conservation (Nadkarni & Puthuvayi, 2020). Over the past five years, there has been a noticeable upward trend in research publications of conservation studies within the domain. Nadkarni's literature study lists the top five MCDM used in conservation disciplines as; "alternate use/adaptive reuse selection," "priority order for renovation/ restoration/ rehabilitation," "value assessment," "evaluation of alternative solution for renovation," and "Assessment of functional service life" (Nadkarni & Puthuvayi, 2020). Methods are used primarily for ranking and weight determination at the assessment and choosing problems. Table 1 summarizes the essential scientific works in the literature related to implementing MCDA in decision-making problems within cultural heritage. It highlights the areas of application, evaluation method, the aim of assessment, type of criteria, value type, and decision-makers.

Due to the complex nature of cultural heritage, decision-making processes it is necessary to utilize multiple methods in conjunction with one another. Literature indicates AHP as the common method for cultural heritage both for ranking and weight determination. According to Table 1, the other methods used in different periods of the processes are multi-attribute approaches, Fuzzy, WSM, FTOPSIS, TOPSIS, FDM, Swing Weights, and ANP. Direct Assessment is mainly used for determining the value of the criteria.

The latest studies applied to MCDM commonly for choosing appropriate alternatives for adaptive reuse projects (Table 3.1). Some studies focus on selecting the best and most relevant alternatives(Chen et al., 2018; Ferretti et al., 2014; Giuliani et al., 2018; Vehbi et al., 2021), while others focus on selecting economical (Meng et al., 2023; Ribera et al., 2020) and sustainable ones (Cucco et al., 2023; Salerno, 2020). Based on the analysis of the application and evaluation objectives of the adaptive reuse project, it is evident that they used the methods with two different approaches: ranking the alternatives with and without value assessments. Certain studies assign a value to each

criterion and then calculate an overall score for each alternative to rank them (Chen et al., 2018; Ferretti et al., 2014; Giuliani et al., 2018; Meng et al., 2023; Salerno, 2020), whereas others choose to rank and select a single alternative without performing any value calculations (Cucco et al., 2023; Ribera et al., 2020; Vehbi et al., 2021).

Table 3.2 Resent cultural heritage articles related to MCDM (continue in 53)

Citation	Areas of application	Evaluation method	Aim of the assessment	Type of indicator	Journal	Decision makers	Indicator evaluation
(Cucco et al., 2023)	Reuse of historical buildings	AHP (value), direct (weight)	To rank to select best reuse model in accordance with 2030 SDGs	discrete	Journal of Cultural Heritage	Writer	AHP (0-1) Executor: writer
(Meng et al., 2023)	Reuse of historical buildings	AHP-FTOPSIS	To sort alternative transformation ways of heritage to determine the best and low cost methos	discrete	Sustainability	Experts (weights) Expert (TOPSIS ranking)	Executor - Direct 60-100 (good, better, medium, worse, poor)
(Guerriero et al., 2022)	Heritage Risk Studies	WSM, AHP	To assess of multi-hazard susceptibility of cultural heritage, the Derwent Valley Mills.	discrete	Journal of Cultural Heritage	Writer	Direct assess. (0-1) Executor: writer
(Vehbi et al., 2021)	Reuse of historical buildings	AHP	To choose the compatible new use; Kyrenia Cyprus	discrete	Sustainabilty	Weights: Experts and locals	-
(Khatakho et al., 2021)	Heritage Risk Studies	AHP	To rank to assess the multi hazard risk of Katmandu Valley	Discrete/ finite	Sustainability	Writer	Direct Assessment: 1-5
(Ravankhah et al., 2021)	Heritage Risk Studies	AHP Direct Assessment	To weigh the vulnerability criteria and rank the historical buildings according to seismic vulnerability in Iran	discrete	International Journal of Disaster Risk Reduction	Weight and indicator: Experts	Direct ass. 1-5 Executor: writer
(Salerno, 2020)	Reuse of historical buildings	AHP / Direct Assessment	To rank the sustainability of an adaptive reuse project and evaluate value of heritage	Discrete	Sustainability	Weight (AHP): Experts	Direct assessment : 1-5 Executor: writer
(Ruiz-Jaramillo et al., 2020)	Heritage Risk Studies	Risk-UE method	To rank the heritage buildings according to the risk and evaluate priority of intervention	Discrete	Frontiers of Architectural Research	writer	Good to very poor Executor: writer
(Ribera et al., 2020)	Reuse of historical buildings	AHP (value) Direct (weight)(equal)	To ranking and selection the most economical and appropriate adaptive reuse alternative,	discrete	Journal of Cultural Heritage	Weight: writer	AHP (0-1) Executor: experts
(Jena et al., 2020)	Heritage Risk Studies	AHP (weight) Direct (value)	To rank to assess seismic vulnerability of cultural heritage, Northern Sumatra	discrete	International Journal of Disaster Risk Reduction	Weight and indicator: Experts	Direct Assessment: 1-5 Executor: writer
(Du et al., 2020)	Heritage Risk Studies	AHP-TOPSIS (weight)	To rank to assesses the damage and vulnerability levels of Earthen Sites of the Ming Great Wall	discrete	International Journal of Architectural Heritage	Value: writers(s) Weight: experts	Direct Assessment: very high – very low

Citation	Areas of application	Evaluation method	Aim of the assessment	Type of indicator	Journal	Decision makers	Indicator evaluation
(Giuliani et al., 2018)	Reuse of historical buildings	MADA (Multi-Attribute Decision Analyses)	To rank to find the best adaptive reuse application of the grain silos in İtaly, Arezzo.	Discrete	Journal of Cultural Heritage	Weight and indicator: Municipality and the Office for Heritage Protection and Inhabitants (value)	Direct Asses., Perfor-mance matrix: 0-1 Executor: inhabitants
(Chen et al., 2018)	Reuse of historical buildings	FDM (Fuzzy Delphi Method) ANP	To evaluate and choose the most appropriate reuse alternative for heritage building	discrete	Habitat International	ANP; weight and priority order: experts	ANP (1-4)
(Nicu, 2016)	Heritage Risk Studies	AHP, direct	To rank to assess cultural heritage vulnerability against natural disaster, Romania.	discrete	International Journal of Disaster Risk Reduction	Individual: writer	Direct Assessment: low-very high Executor: writer
(Ferretti & Comino, 2015)	Assessment of complex heritage sites	MAVT, Swing weights	To assess the value of complex cultural heritage areas for the sustainable management	Finite/ discrete	Journal of Cultural Heritage	Weight (Swing weights) and indicator: Expert	Mid-value splitting and Direct Assessment: 0-1 Executor: writer
(Ferretti et al., 2014)	Reuse of historical buildings	MAVT	To rank and select more appropriate historical buildings in Torino (Italy) for the reuse	Finite/ discrete	Journal of Cultural Heritage	Evaluation model and weight: Experts	Direct assessment : 0-1 Executor: writer
(Kim et al., 2010)	Restoration	AHP, S-AHP	To rank to determine appropriate restoration priorities of cultural heritage in Korea	Discrete	Journal of Cultural Heritage	Weight (AHP): Delphi-experts Value: writer	0-10 Executor: writer

Based on the eight articles in Table 3.2, assessment studies are the second most widely used field for MCDM in cultural heritage. Ferretti (2015) developed an assessment method using MAVT for complex cultural heritage properties (Ferretti & Comino, 2015). MCDM methods can be preferred at various stages of risk assessment studies, such as hazard, vulnerability, and susceptibility evaluation. Jaramillo (2020) describes the RISK-UE method for ranking heritage buildings based on the level of risk and evaluating the priority of the intervention (Ruiz-Jaramillo et al., 2020). Vulnerability assessments can be conducted for a specific hazard, such as seismic damage (Jena et al., 2020; Ravankhah et al., 2021), multiple hazards, such as natural disasters (Nicu, 2016), or all possible damages to a heritage site (Du et al., 2020; Guerriero et al., 2022; Khatakho et al., 2021). Assessment studies need a value for comparing and interpreting the results of the different cultural heritage properties. Accordingly, following creating the decision tree with criteria and sub-criteria and determining the weight, they need the value decision of each

criterion. Criteria can have finite or discrete outcomes. Recent studies commonly preferred the direct assessment method for indicator evaluation with different ranges like 0 to 1, 1 to 5, 1 to 10, and good to bad. (Table 3.2).

The selection of the decision-maker is another crucial issue in MCDM. In order to ensure the sustainability of cultural heritage areas, it is necessary to involve diverse groups from various fields to make unbiased decisions, given that these areas are intricate and constantly evolving systems. There are three main decision stages in the MCDM process: creating the decision tree, weighting, and measuring the indicators. Mainly, the executors or writers make the decision criteria tree; the decision-making process in cultural heritage can involve the participation of experts, locals, stakeholders, and governmental groups (Table 3.3). Some studies may prefer group decision-making during the weighting process, while others may prefer it while measuring the criteria indicators. In some cases, it can be followed that they even prefer the evaluation of the indicator value by the groups.

Table 3.3 Decision maker selection of selected articles

Areas of application	Authors	Decision tree	Weight	Indicator measurement criteria	Indicator measurement decision
Reuse of historical buildings	Cucco et al.	I: writer	I: writer	I: writer	I: writer
	Meng et al.	I: writer	G: experts	G: experts	I: writer
	Vehbi et al.	I: writer	G: experts and locals	-	- (ranking)
	Salerno, E.	I: writer	G: experts	I: writer	I: writer
	Ribera et al.	I: writer	I: writer	G: experts	(ranking)
	Giuliani et al.	I: writer	G: e Municipality and the Office for Heritage Protection and Inhabitants	G: Municipality and the Office for Heritage Protection and Inhabitants	G: inhabitants
	Chen et al.	I: writer	G: experts	G: experts	(ranking)
	Ferretti et al.	G: experts	G: experts	I: writer	I: writer
Heritage Risk Studies	Guerriero et al.	I: writer	I: writer	I: writer	I: writer
	Khatakho et al.	I: writer	I: writer	I: writer	I: writer
	Ravankhah et al.	I: writer	G: experts	G: experts	I: writer
	Jaramillo et al.	I: writer	I: writer	I: writer	I: writer
	Jena et al.	I: writer	G: experts	G: experts	I: writer
	Du et al.	I: writer	G: experts	I: writer	I: writer
	Nicu, IC.	I: writer	I: writer	I: writer	I: writer
Assessment of complex heritage sites	Ferretti and Comino	I: writer	G: experts	G: experts	I: writer
Restoration	Kim et al.	I: writer	G: experts	I: writer	I: writer

MCDM studies on the risk issues of cultural heritage, just as other heritage risk studies, focused mainly on more measurable and predictable threats like natural hazards (Table 3.2). Unlike the former, this study develops a model for resilient rural landscapes as cultural heritage against habitus change. The research examines the possible hazards for the rural heritage areas and claims the habitus transition has gradually and unforeseen but severe harm on the sites. Evaluating the risk and creating resilience strategies against

habitus transition requires understanding the hazard and assessing the vulnerabilities. Given the scarcity of studies, reports, regulations, or decisions regarding the transition of habitus and cultural heritage areas, a fresh approach was necessary for conducting vulnerability assessments in response to habitus changes. MCDM has decided to apply for the vulnerability assessment's susceptibility and capacity analyses. Human and habitus studies are more socio-cultural analyses and can conclude more subjective results. To develop a method that can be applied to numerous rural heritage areas, ensuring objectivity and inclusivity, the utilization of MCDM methods has been deemed suitable.

Following comprehensive studies on the habitus, rural landscapes, and cultural heritage, the topics of habitus change, rural transition, and the effects on the cultural heritage sites have been thoroughly discussed and analyzed. As a result, criteria, sub-criteria, and vulnerability indicators are created. The literature review of the MCDM in cultural heritage studies, including the decided indicators and the information type desired to be conducted at the end of the assessment, guided the selection of the decision method. When research needs a certain answer or choice like a specific reuse function, method for restoration technique, material, or heritage building, it can be decided without indicator measurements. However, some studies need a value measurement for sorting, ranking, and making interpretations via these values. Cultural heritage fields can prefer these two approaches according to the aim of the study. This study aims to find the vulnerability score of the cultural heritage aspects of a rural landscape as heritage one by one; therefore, a method that gives the opportunity to find a value is required. Due to the variety of methods it offers for determining weights and indicator measurements, the different evaluation methods it provides for indicators with finite and discrete outcomes, and its inclination toward group decisions, MAUT (Multi-Attribute Utility Theory) has been decided to be used. The calculated utility values of the cultural heritages will be the vulnerability score, which can help interpret the susceptibility and lack of adaptive capacity. MAUT offers alternative methods for weight and objective value decisions, and this can diversify the usage of the for different decision-maker groups and heritage sites. As mentioned in recent studies, group decisions effectively impact cultural heritage studies because of the need for consensus, especially for decisions without defined solutions. Using MAUT and expert opinions, resilience strategies can be formulated to address vulnerabilities arising from habitus transition.

3.2.3 Utility Methods - MAUT

This study utilizes the MCDM methods to evaluate the vulnerability of resilience of the rural landscapes as heritage against habitus change. Vulnerability evaluation results need a finite number for the discussion of resilience, and chosen method should answer the choosing and ranking of the alternatives. Living cultural heritage areas can define as complex and multilayered organisms. Therefore, they need a multi-attribute approach to value assessment by dividing problems into sub-systems.

Fishburn, Raiffa, and Keeney and Raiffa started to define multi-attribute decision-making approaches, and Multi-Attribute Value Theory (MAVT) and Multi-Attribute Utility Theory (MAUT) were developed from it (Fishburn, 1967; Keeney & Raiffa, 1976; Raiffa, 1969). Multi-attribute methods can answer a finite and discrete set of different choice problems, which can be described as objectives or criteria. Objectives and criteria can occur from some sub-alternatives measured on a different scale. Multi-attribute approaches aim to collect these finite and discrete alternatives in different scales with the same real number value systems while bringing them to the same scale. MAVT is a less complex version of the MAUT because it does not attempt to simulate the risk-taking behavior of the decision-maker (Belton, 1999). Multi-attribute preference theorems focus on determining and quantifying a decision-maker's choice among the various possibilities and formulating appropriate functions representing the DM preferences (J. S. Dyer, 2005). These representative functions can be divided into two groups according to the certainty (MAVT) and risk (MAUT) circumstances of preferences, value, and utility functions (J. S. Dyer, 2005). Rural landscapes are living organisms and their vulnerability assessment has multi-attribute problems. Every rural landscape has its own resilience questions so MAUT can be selected as a more comprehensive method of the various preferences on the vulnerability of the rural landscape as heritage.

Keeney and Raiffa (1976) created the basis of the MAUT from the value theorems, which can handle multiple objectivity and uncertainty of choice problems by organizing, assessing, and choosing alternatives. MAUT process has four main steps; decision structuring, describing alternatives, explaining the preferences, and analyzing alternatives (Chelst & Canbolat, 2011).

Decision Structuring; is the first and most critical step of the successful MAUT process. There is no one accurate decision tree; they need to build according to the unique

needs of the decision problem (Belton, 1999). The structuring process of the MAUT can explain in three (Chelst & Canbolat, 2011);

"• Identify and clarify requirements, goals, and objectives and define the problem scope. The *requirements specify what needs to be accomplished and the basic capabilities that must be designed into a new product or service.*

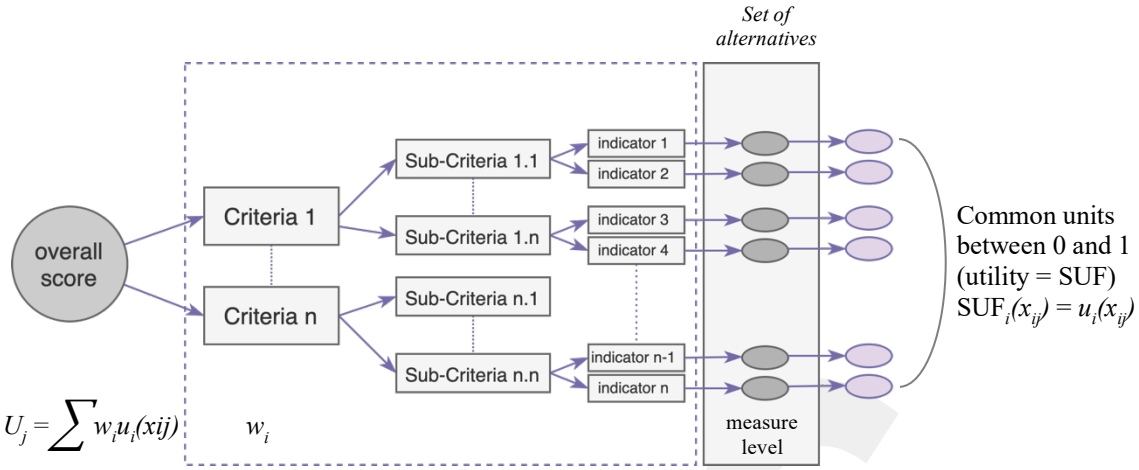
• Define relevant measures affecting the decision outcome and structure them into a hierarchical form called an objectives hierarchy.

• Create measure scales for hard-to-quantify variables such as customer satisfaction, implementation difficulty, and overall risk."

Describing Alternatives; covers collecting the required information for choosing. The process can start with *deciding* the range of alternatives and continues preparing their data according to the criteria. This part can be the longest part of the decision-making due to the range of alternatives and accessibility (Chelst & Canbolat, 2011).

Explaining the Preferences; includes evaluation of the overall value of the alternatives. Decision makers should assign the weights of the objectives and sub-objectives using several methods for deciding the relative importance of criteria. The second duty of the decision-maker is to develop a unique utility function that changes each sub-objective to a value range of 0 – 1 (Keeney & Raiffa, 1976).

Analyzing Alternatives; begins after the calculations of the overall values are carried out. These scores contribute to comparing alternatives, determining the uncertainty, and conducting sensitivity analysis due to the assigned weights (Chelst & Canbolat, 2011).



*"**x_{ij}** is the raw score of alternative **j** on measure **i.***

***$u_i(x_{ij})$** is the decision maker's utility function for measure **i,** transforming the raw score into a utility value between 0 and 1.*

***w_i** is the decision maker's weight assigned to the **i**th measure."*

Figure 3.1: MAUT model formulation (adopted by Chelst and Canbolat).

Utility functions convert the various type of measurements of the discrete and finite sets of alternatives to one objective scale (Figure 3.1). MAUT offers several evaluations, but the joint and primary function is the additive model (Belton & Stewart, 2002; Ishizaka & Nemery, 2013; Keeney & Raiffa, 1976);

for the normalizing the weights:

$$\sum_{i=1}^{n} w_i = 1$$

For the overall utility score,

$$U_j = \sum_{i=1}^{n} w_i u_i(x_{ij})$$

Following structuring the decision with a decision/value tree, the additive model covers two main steps; determining the weights and utilities of the objectives. Weight means the comparative significance of the objectives (Chelst & Canbolat, 2011). The methods for determining these criteria weights should be connected to how they are used, as it has been widely accepted that their validity and meaning are essential for preventing the inappropriate use of MCDM models. The most popular weight assignment methods are; swing weight, rating, pairwise comparison, trade-off, and qualitative translation (Beinat, 1997). Each rural landscape is particular, and according to the requirements of a

case study and selected experts, decision-makers need to choose an appropriate method from the aforementioned examples.

The following step is the decision of the utility value for each criterion. MAUT offers utility functions for translating human decisions to mathematical representation to use the additive model. A utility value is an abstraction that can be ranked between 0 (the worst alternative) and 1 (the best alternative) of a criterion's finite and discrete alternatives (Chelst & Canbolat, 2011). The linear and nonlinear utility functions and direct rating methods are most common for evaluating the utility value of the criteria. The linear and nonlinear utility functions with the mid-level splitting method can only use for continuous measures. However, the direct rating/assessment method can also be used for discrete measures (Beinat, 1997; Chelst & Canbolat, 2011). In the direct assessment, decision-makers or groups can rate the relative weights of various degrees of an attribute using a numerical scale (0 to 1) and create their utility function (Beinat, 1997).

3.2.4 Analytic Hierarchy Method (AHP)

The Analytic Hierarchy Process (AHP) developed by Saaty in the 1970s is one of the most appropriate methods for the weight assessment of vulnerability. It is widespread and allows group decisions, so its familiarity gives permission to explain things easily to the experts. AHP facilitates rational and intuitive decision-making in selecting the best alternatives based on specific criteria (Saaty & Vargas, 2012). The RUHET vulnerability decision tree consists of many indicators, and the pairwise comparison method allows for reducing them into two; thus, the process can be realized uncomplicated. In this procedure, the decision-maker conducts straightforward pairwise evaluations, subsequently utilized to establish comprehensive preferences for ordering the options. The AHP permits judgment discrepancies while offering a method to enhance coherence (Saaty & Vargas, 2012). The steps of the AHP process are listed (Ishizaka & Nemery, 2013): problem structuring, priority calculation, consistency check, and sensitivity analysis.

Firstly, the decision problem and outline of the criteria and alternatives involved should be defined. Then, decision-makers compare elements in the hierarchy based on their importance or preference. Using a scale (usually from 1 to 9), they assign values to each pair of elements, indicating how much one is preferred over the other in the evaluated

criterion (Table 3.4). This process helps in quantifying subjective judgments. Determining the relative priorities of criteria and ranking alternatives relies on the decision-maker expressing their thoughts in a single pairwise comparison at a time; these comparisons can be conducted through verbal expressions or numerical scales (Triantaphyllou, 2000). Table 4.2 demonstrates the degrees of importance expressed by the numerical scale developed by (Saaty, 2008) for pairwise comparisons and the assessment intervals they represent.

Table 3.4 1-9 fundamental scale for the pairwise comparison (Saaty & Vargas, 2012)

Intensity of importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective
2	Weak	
3	Moderate importance	Experience and judgment slightly favor one activity over another
4	Moderate plus	
5	Strong importance	Experience and judgment strongly favor one activity over another
6	Strong plus	
7	Very strong or demonstrated importance	An activity is favored very strongly over another; its dominance demonstrated in practice
8	Very, very strong	
9	Extreme importance	The evidence favoring one activity over another is of the highest possible order of affirmation

AHP involves ensuring the consistency of judgments made during pairwise comparisons. Saaty developed a consistency ratio to check if the comparisons are logical and consistent (Saaty, 2008). If the decisions aren't compatible, reviewers may need to revise their pairwise comparisons. Based on the comparisons, a matrix is formed, and from that, the eigenvector (priority vector) corresponding to the largest eigenvalue is computed. This vector represents the relative importance of elements in each hierarchy level. The priority vectors obtained from different levels are aggregated to determine the overall priorities of the alternatives based on the defined criteria. In addition, the sensitivity analysis step involves testing the robustness of the results by checking how changes in the inputs (pairwise comparisons) affect the final priorities (Ishizaka & Nemery, 2013).

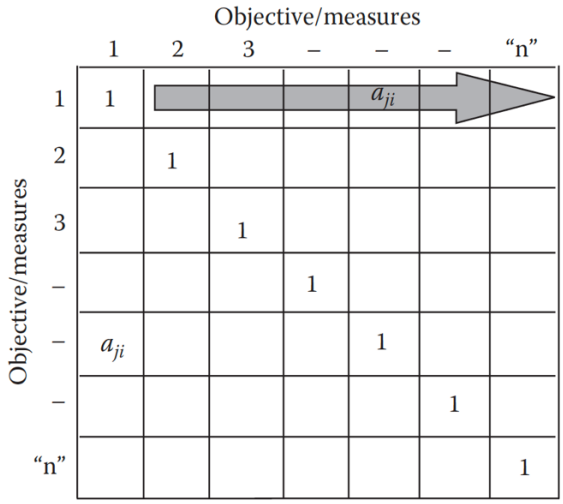


Figure 3.2 Pair-wise comparison matrix (Chelst & Canbolat, 2011)

One of the substantial advantages of the AHP for the RUHET vulnerability weight assignment is its availability for group decisions. Saaty has outlined the process of group decision-making using AHP, encompassing recommendations on forming the group, conducting the decision-making session, fostering consensus within the group, addressing power imbalances, managing concealed or biased preferences, and executing the outcomes (R. F. Dyer & Forman, 1992). Two fundamental approaches exist to combining individual preferences into a collective preference, determined by whether the group aims to function as a unified entity or as distinct individuals. These are named Aggregation of Individual Judgements (AIJ) and Aggregation of Individual Priorities (AIJ) (Forman & Peniwati, 1998). In the first scenario, the geometric average of individual judgments (AIJ) meets the condition of reciprocity, suggesting a collaborative fusion of individual preferences, transforming the group into a collective entity that operates as a single unit. However, when group members function as individuals (AIP), the resulting priorities can be derived using either a geometric mean (indicating an average ratio) or an arithmetic mean (indicating an average interval) of their preferences(Forman & Peniwati, 1998).

3.3 Chapter Review

In the first part of Chapter 3 of the thesis, definitions of sustainability, resilience, and risk in the literature were provided, and sub-indicators based on vulnerability were examined. The second part investigated methods used in calculating the criteria identified for sustainability. As a result, vulnerability parameters and the most suitable evaluation

method have been determined for creating sustainable rural heritage in the face of transition.

To effectively develop a suitable protection model against risks arising from changes, it is imperative to have a comprehensive understanding of the nature and characteristics of the specific threat. This involves analyzing the potential impacts, vulnerabilities, and patterns associated with the evolving risks and considering the broader context of the environment in which they occur. By gaining insights into the underlying factors driving the risks and their potential consequences, appropriate measures to mitigate and manage the associated challenges can be better identified and implemented.

Sustainability and resilience approaches are discussed together to generate a model for rural heritage in transition conservation. Sustainability involves establishing, evaluating, and upholding adaptive capacity, while development entails establishing, evaluating, and sustaining opportunities (Holling, 2001). As a result, sustainable development is perceived as aiming to foster adaptive capabilities and generate opportunities. In the face of unpredictable and abrupt changes that have given rise to uncertain sustainability challenges in today's world, the resilient approach has emerged as a response. This approach is designed to adapt to these changes and ensure the sustainability of heritage sites. Resilience proves valuable under its perspective grounded in uncertainty and dynamism, serving as a vital instrument for addressing today's development challenges. It is essential as a comprehensive approach to sustainability, especially in light of the growing recognition of various systems and the expanding interest in all aspects of human existence. Therefore, it can be assessed that resilience or sustainability is inherently broader; instead, they can be seen as complementary metaphors that work in tandem to address complex challenges.

Rural heritage as complex systems is characterized by interconnected components, nonlinear relationships, and emergent behaviors, making decision-making within such systems highly intricate. MCDM methods offer a structured approach to evaluating and prioritizing alternative courses of action based on multiple criteria or objectives. Furthermore, MCDM methods provide decision support tools for analyzing complex systems' dynamics and exploring various scenarios and their potential outcomes. They

help decision-makers identify the most promising courses of action while considering uncertainties and risks inherent in complex systems.

It is crucial to reassess the concepts of sustainability and resilience to establish a foundation for identifying indicators of vulnerabilities due to the habitus transition in rural heritage. This helps to manage uncertainty and transition through enhanced vulnerability, controlling susceptibility, and fostering coping and adaptive capacity to manage unforeseen shocks. Due to the aforementioned discussions, this thesis accepts vulnerability as susceptibility, coping, and adaptive capacity and uses MCDM methods for the assessment of these components.

Chapter 4

Building Strategies for Resilience of Rural Landscapes as Heritage in Transition

The "Stage 4: Developing a Sustainability Model by Assessing and Decreasing Vulnerabilities" phase of the study involves a model for establishing sustainability enlarged with resilience approaches for the rural heritages by struggling vulnerabilities against the consequences of the habitus change. The chapter addresses the sub-hypothesis: "*To create sustainable rural heritage against habitus transition, it is essential to investigate the factors causing change and assess and decrease the sensitivity and strengthen coping and adaptive capacity with threats today and in the future."* Tries to answer the research question: "*How can the vulnerability of the rural heritage under the habitus transition be assessed for leading heritage risk management?*".

The chapter starts with the proposed sustainability approaches according to the former discussions and emerging components related to this. This sustainability approach for the rural heritage against habitus transition led to the generation of the model. The thesis aims to develop a sustainability model without risk assessment, focusing on vulnerabilities. The chapter continues with the decision of the sub-criteria and indicators of susceptibility, coping, and adaptive capacity as a component of the vulnerability. The part is finalized with the application stages of the created model and the explanation of how this model contributes to the development of sustainability strategies for rural heritage in transition.

4.1 RUHET- Sustainability of Rural Heritage in Transition Model

The RUHET (Sustainability of Rural Heritage in Transition) model is created to offer a sustainable conservation approach for living in rural heritage under transformation. Sustainability should not be viewed as a static condition for systems' intricacy, dynamics, and non-linear nature. Thus, providing sustainability requires

embracing the dynamic concept of resilient systems. Considering sustainability without acknowledging the concept of resilience or contemplating resilience without incorporating sustainability would lack a forward-looking, future-oriented viewpoint (Yaman Galantini & Tezer, 2018). Resilience can be characterized as a significant theoretical advancement in comprehending the origins of sustainability (Pierce et al., 2011). Resilience deals with the dynamics of complex adaptive systems and addresses genuine uncertainty, focusing on learning to coexist with change and leveraging it to our advantage. In a resilient system, change can foster possibilities for growth, newness, and inventive solutions. Conversely, even minor alterations in a vulnerable system can have catastrophic consequences (Folke et al., 2002).

The dynamism inherent in resilience is rooted in the dynamism of nature and humans. Therefore, the sustainability model of the habitus transition should be developed by discussing the components of resilience. By merging sustainability and resilience, we can create a model for rural heritage conservation against transition risk that preserves cultural heritage values by strengthening the capacity to withstand and respond to emerging habitus transition challenges. Sustainability and resilience work together to take preventive actions regarding resource use and potential emerging risks, thereby reducing vulnerability (Yaman Galantini & Tezer, 2018).

The model focuses on the vulnerabilities that occur regarding the habitus transition to create sustainability in rural landscapes. Vulnerability can be assessed as a forward-thinking concept, considering the probability of injury, loss, and disruption (Wisner et al., 2004). This implies that vulnerability assessment should prioritize identifying the factors that render the system vulnerable and exhibit significant disparities in susceptibility, coping, and adaptive capacities (Figure 4.1). As complex systems, cultural heritage sites require comprehensive risk assessment systems. Even some methods and models developed for cultural heritage risk and vulnerability assessments mainly involve natural and human-induced hazards with definite indicators; each heritage type is under various risks and requires sustainability approaches due to their context. This study indicates that the social, natural, and built environment changes, defined as habitus transition in the scope of the thesis, cause risks to the cultural heritage value. The habitus transition can be explained as the cumulative results of the multi-changes in the users' environment. This nature of it complicates making assessments with finite results with the published risk assessment approaches. Therefore, the model does not generate a risk assessment; it

aims to create strategies for sustainability by managing vulnerabilities. RUHET approves the habitus transition as a hazard and aims to conserve through decreasing susceptibility while raising together with coping and adaptive capability against it (Figure 4.1).

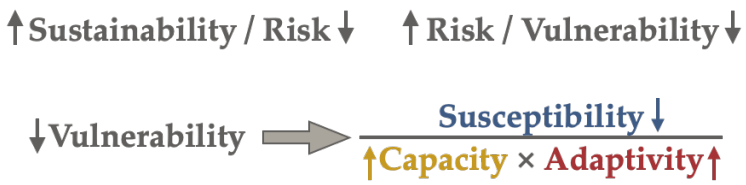


Figure 4.1 Sustainability, risk and vulnerability dynamics

In conclusion, the model assesses three main criteria: susceptibility, coping, and adaptive capacity for interpreting rural heritage vulnerability under habitus transition risk. Former studies and Table 3.1 indicate that vulnerability management and reducing approaches contribute to contributes by decreasing the risk. For the sustainable rural heritage under transition, the model aims to reduce susceptibility while raising coping and adaptive capacity.

4.2 Vulnerability Assessment

Resilience can be defined as the ability of a system and its components to survive against hazards by recovering and adapting to new circumstances. Even vulnerability is discussed as the opposite of resilience and regarding sustainability; it is an indicator for the understanding capability of the resilience of a system. Numerous definitions, conceptual frameworks, and methods have been developed for vulnerability. It can be summarized as the inclination or tendency to be negatively influenced or impacted (IPCC, 2012a). For these reasons, the vulnerability assessment is the most required phase of the RUHET. The multicriteria decision method (MCDM) is discussed for its easy and common usage as the assessment methodology.

In this part of the thesis, the vulnerability assessment methodology of the RUHET is discussed and listed. In the former chapter, MCDM approaches are explained by examining MCDM usage in cultural heritage studies, and the most appropriate decision-making method for the model is discussed. The decision is structured according to the needs of the selected study model, MAUT. On account of the RUHET approach offering discrete measures for assessing the utility value of the criteria, the direct value rating

method is suggested. In addition, the users of RUHET can develop their own decision tree with continuous measures and manage the process with alternative value assessment methods. Next, the decision tree is created, and criteria and indicators are defined with the selection application. Finally, for applying the assessment method, decision maker selection, weight and utility value determination, and collecting the data from the rural landscapes as a heritage for the calculation is explained. Consequently, in this part of the thesis, the decision tree of vulnerability assessment of the model is clarified clearly in later sections.

4.2.1 Vulnerability Decision Structuring

The RUHET questions the resilience conservation approaches against the changes in the heritage context. When the questions and answers are listed, it is understood that RUHET focuses mainly on discrete decisions, which differs from the former and common risk studies. As a result of the literature review, it has been decided that the most suitable method to be used in vulnerability assessments of rural heritage areas in the face of change is MAUT. It can simultaneously respond to finite and discrete choices and offer different decision-making method combinations for individuals and groups. The recommended method has been chosen for its ease of understanding and implementation, allowing the practitioner to customize it according to the specific needs of the rural heritage area and working groups specific needs. MAUT enables the customization of the study with the alternatives it offers in weight and utility calculations.

Just like in all multi-criteria decision-making methods, the vulnerability studies of RUHET have started by creating a decision tree. Vulnerability assessment can be conducted by investigating susceptibility (sensitivity), coping capacity (manageability),

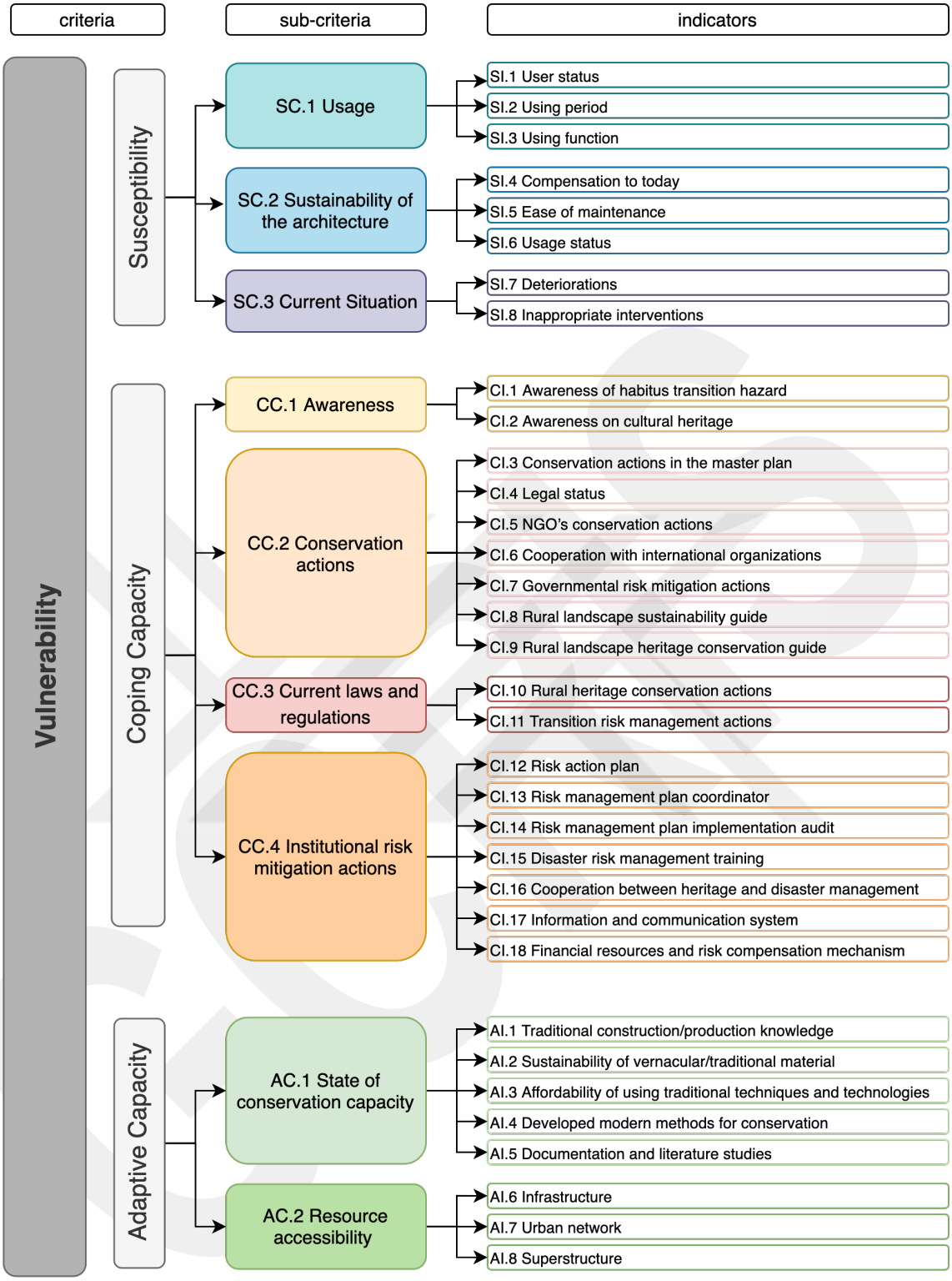


Figure 4.2 Decision structure of the RUHET vulnerability assessment.

and adaptive capacity as critical factors (Figure 4.1) (Birkman, 2006). Vulnerability is directly proportional to susceptibility and inversely proportional to coping and adaptive capacity the former studies on cultural heritage vulnerability, these two factors were

selected as criteria for the assessment tree (Gökmen Erdoğan, 2022; Ravankhah et al., 2021).

At the RUHET model vulnerability assessment of the rural landscapes, heritage needs complex approaches due to the habitus transition, which can result from the multiple developments and disasters on the site. Nevertheless, these multiple hazards require a holistic way of looking for the involvement of each indicator and a clear assessment structure. This assessment tree only focuses on the rural heritage sites and recommends gathering information for each component. So, the study realized the sub-criteria and indicators created in the two stages: cultural heritage conservation and habitus transition effects on the vernacular rural settlement research (Figure 4.2). These processes are carried out simultaneously, and international texts are examined for indicator structuring (Table 4.1). Many international texts related to monuments to sites, natural to build environment, archeological to vernacular environment, and tangible to intangible cultural heritage benefit from the decision tree structuring. Table 4.1 compares most referred texts, relevant articles, and indicators.

The Venice Charter was selected for its value in developing contemporary restoration principles and explaining states of conservation capacity and current situation sub-criteria. The UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage emphasizes the significance and power of institutional mitigation actions. The Declaration of Amsterdam and the Washington Charter refer to the built environment and its coping capacity issues. Recommendations, which COE published in 1989 and 1990, point out the conservation problems and resource accessibility of the rural areas. While the Nara Document on Authenticity supports the decision structure on the intangible, the Charter on Vernacular Architecture and Principles for the Analysis, Conservation, and Structural Restoration of Architectural Heritage supports tangible aspects of the structure. The Framework Convention on the Value of Cultural Heritage for Society, Valletta Principles, and Burra Charter contribute to developing many indicators due to their holistic conservation approaches. Since the model created in Turkey aims to cover all rural landscapes as heritage, the Architectural Heritage Conservation Charter published by ICOMOS Turkey is considered in the model preparation phase. The last and most critical document for this model is the Principles Concerning Rural Landscapes as Heritage since it is the first document that directly emphasizes the features of the rural landscapes together with the action strategies. The

created decision three's criteria and indicators and the assessment systems are explained in the following sections (Table 4.1).

Table 4.1 International texts related with the RUHET decision structure

		Venice Charter (1964)	**World Heritage (1972)**	**Amsterdam Dec. (1975)**	**Washington Char. (1987)**	**Rec (89) (1989)**	**Rec (90) (1990)**	**The Nara Doc. (1994)**	**Vernacular Arch. (1999)**	**Architectural Her. (2003)**	**Faro Convention (2005)**	**Valetta Principles (2011)**	**Burra Charter (2013)**	**Architectural Her. (2013)**	**Rural Landscapes (2017)**
		ICOMOS	UNESCO	COE	ICOMOS	COE	COE	UNESCO ICOMOS	ICOMOS	ICOMOS	COE	ICOMOS	ICOMOS AUSTR.	ICOMOS TÜRKİYE	ICOMOS IFLA
Coping Capacity	**CI.1**			i, j						2.6		3.f, 4.h, 2.c			1B, 1C
	CI.2			i, j	3, 5, 15	I, IV	xiv	9	Prac. 7		4, 5, 9a, 12	4j		IV.1 .3	1B, 1C, 2A
	CI.3		5	page 1-g, 2	1	II	iii			2.2	8	3.d, 3.h, 4.k		V	2B, 2C
	CI.4		5	1-g					Gen. 3			3.h			
	CI.5			1-j			iv				11,12				
	CI.6		6,7,8												
	CI.7		5			II, III					5.g, 8, 15	3.h, 4.k			
	CI.8				14						5.g, 15	3.a, 4.h, 4.k, 4.l			1F, 2B 2C
	CI.9														
	CI.10			1-g,3					Gen 3		5	3.h, 4.k, 4.l	2		2B
	CI.11			1-g											
	CI.12			3							16	4.h			2B, 2C
	CI.13											3.h, 4.h, 4l			
	CI.14		5												
	CI.15		5,8, 27	1-i, 3,5	16				Prac. 7	2.2				V, VI	
	CI.16		5	3,5	5						17	3i		V	
	CI.17			3							14, 16	4.l			
	CI.18		15	1-h							10				2C
Adaptive Capacity	**AI.1**	4, 9						13	Prac. 3	2.3	9.d, 13		4, 16, 21	IV.2	2.D
	AI.2	4									9.d				
	AI.3														
	AI.4	4, 10							Prac. 4						
	AI.5	4, 16				I	xv		Prac. 1		9.d, 13		16, 21, 26	IV.1 .1 IV.1 .4 IV.2	
	AI.6						ix					4.e, 4.f			2.C.5
	AI.7						v								
	AI.8						x, xi, xii				10				
Susceptibilit	**SI.1**			Page 3								2.c, 3.j			2.C.2
	SI.2														
	SI.3								Prac. 5			2.c, 4.b	15, 7, 23		
	SI.4								Gen.						2.C.5

		Venice Charter (1964)	World Heritage (1972)	Amsterdam Dec. (1975)	Washington Char. (1987)	Rec (89) (1989)	Rec (90) (1990)	The Nara Doc. (1994)	Vernacular Arch. (1999)	Architectural Her. (2003)	Faro Convention (2005)	Valetta Principles (2011)	Burra Charter (2013)	Architectural Her. (2013)	Rural Landscapes (2017)
		ICOMOS	UNESCO	COE	ICOMOS	COE	COE	UNESCO ICOMOS	ICOMOS	ICOMOS	COE	ICOMOS	ICOMOS AUSTR.	ICOMOS TÜRKİYE	ICOMOS IFLA
	SI.5								2, 3				7, 15, 16, 21		
	SI.6								G-3, P-5						
	SI.7	5, 6							G-2	2.3		4.a	15	IV.1 .2 IV.2 IV.3	
	SI.8								G-2, P-6	1.3, 2.3			3.1, 22		
(COE, 1990, 2005; ICOMOS-Australia, 2013; ICOMOS-IFLA, 2017; ICOMOS-TÜRKİYE, 2013; ICOMOS, 1964, 1975, 1987, 1994, 1999, 2003, 2011b; UNESCO, 1972, 1989)															

4.2.1.1 Susceptibility

Susceptibility, which is related to the physical situation of the exposed heritage item, can be called the core factor of vulnerability together with capacity (Birkman, 2006). Susceptibility, which can assume fragility or sensitivity in the RUHET, is related to the internal resistance capacity of exposure against habitus transition. Unlike coping and adaptive capacity, the susceptibility is related only to the heritage itself. This criterion will be assessed by exploring the response of the heritage properties to the habitus transition. Sub-criteria and indicators are created by asking which features make weak or strong a heritage against the questioned hazard. Thus, after examining several rural heritage and literature studies (Table 4.1), three sub-criteria are defined about characters making heritage sensitive. The first one is the usage and user characteristics of the heritage properties. Each type of change can be realized only by the user's decisions, which can be making interventions or none. The second sub-criterion questioned the sustainability capability of the vernacular architecture to the transition. The last one is the current situation of the properties. The current interventions and deteriorations can shape the future approaches for the heritage against the transition threat. Due to the diverse characteristics of each rural landscape as heritage with vernacular construction and production techniques, the executors will recreate the evaluation parameters (spaces of the buildings or building element systems). This study considers susceptibility indicators valid for every rural heritage site, while the evaluation sub-parameters are valid for only the selected site. Therefore, the sub-parameters should represent the typology of the selected cultural heritage site. Consequently, susceptibility indicator analyses cover semi-

survey and documentation studies of the heritage itself. These surveys should be realized individually (for each property) carefully according to indicators and sub-parameters;

SC.1 Usage: Inhabitants have been the main actors for the heritage properties due to their one-to-one relation between them. Contemporary conservation actions emphasize the conservation by making it alive with the original user if possible. These areas are the product of the local culture, so the traditional way of life can be maintained with the owner of this culture, the local inhabitants. At the same time, they retain their cultural integrity and social coherence by continuing to live in their heritage site (Bamert et al., 2016). The rural heritages as landscapes created by efforts of humans incompatibly with nature, can be susceptible to the change of the traditional usage by the locals. The usage change of the rural heritage can destroy not only the natural and architectural heritages but also the intangible heritage with sociocultural structure, ecology, and biological diversity of the site. For evaluating the usage as a criterion of susceptibility, three indicators are determined: user status, user period, and using function (Table 4.2).

Table 4.2 SC.1 Usage criteria decision structure

code	criteria	code	indicators	ranking alternatives
SC.1	Usage	SI.1	User status	abandoned non-local user local user
		SI.2	Using period	abandoned seasonal permanent
		SI.3	Using function	abandoned changed function original function

Rural architecture is created by the effects of the local culture and everyday practices. Also, one of the aims of this study is to notice the dynamic relationship between the built environment and intangible aspects of the locals. In this step, it is analyzed firstly whether the heritage properties are used or not, and secondly, whether the user is local. Constant maintenance is a vital process for the survival of any built element of rural life. In ordinary processes, the user is the first responsible for heritage care, so abandonment is the worst-case scenario for the susceptibility. A resilient rural landscape as heritage can only be provided by a living system. Heritage can be vulnerable to habitus transition without an inhabitant or a responsible from care, starting to be demolished daily.

The user profile is the second important issue for assessing the susceptibility of rural heritage. Heritage is created due to the culture, a cumulative behavior like intangible heritage. Besides the physical characteristics, the sense of a vernacular, rural landscape

as heritage that can summarize the meanings of the environment recognized differently due to the different habitus in time should also be protected. The inhabitants imply and perceive these meanings due to the various habitus. Norberg-Schulz called “genius loci” this essence of the settlements and explained it as the collective sense individuals possess about a location, encompassing both the tangible and symbolic values in the natural and built environment (Norberg-Shulz, 1980). At the same time, Rapoport refers to this entirety as "ambiance," which constitutes a comprehensive compilation of physical and socio-cultural characteristics and perceptions (Rapoport, 1993). They refer to what a place symbolizes, suggests, brings to mind, or conveys to individuals (ICOMOS-Australia, 2013). As mentioned in former chapters, there is a dynamic link between rural landscapes and their authentic user, bringing about the spirit of heritage. Accordingly, surviving the heritage with its local users has more advantages for conserving with this spirit, especially for the rural landscapes created by the inhabitants' efforts due to their daily life practices. ICOMOS Valetta Principles, highlights the challenges caused by user change as *“The loss and/or substitution of traditional uses and functions, such as the specific way of life of a local community, can have major negative impacts on historic towns and urban areas. If the nature of these changes is not recognised, it can lead to the displacement of communities and the disappearance of cultural practices, and subsequent loss of identity and character for these abandoned places. It can result in the transformation of historic towns and urban areas into areas with a single function devoted to tourism and leisure and not suitable for day-to-day living.”* (ICOMOS, 2011b). Consequently, the user status should be evaluated in line with whether the heritage is in use or abandoned, and if it is in use, whether the user is local or foreign to the local culture.

The second indicator of the usage criterion is the use period. Due to the settlement's economic, natural, or socio-cultural developments, the living practices could change. When the rural landscape cannot answer the new practices and living requirements, the result can be abandonment. It can emerge in two ways in the rural settlements: leave using the heritage or use it seasonally. As explained with the reasons above, desertion is the worst scenario for a rural heritage item. The second and most popular alternative is using them seasonally. This means visiting the site on weekends or some selected seasons, according to the context of the rural landscape as heritage and the owners' needs. For example, some settlements can be used as summerhouses due to climate features, while others can be preferred as weekend houses due to their closeness to the city centers.

Production or social practices can sometimes be determinative, and sites can be preferred at harvest times. As might be expected, full-time living requires holistic maintenance, owing to answering every practice for various times, while limited care can be enough for part-time living.

The third indicator of the usage criterion is related to the heritage function. From the Venice Charter, doctrinal texts do not reject cultural heritage's function changing without alternatives. However, changing functions can cause foreign users on the site, especially for the housing units, and can require significant interventions. Adaptation to a new function can only be pleasing when the interventions are minimal on cultural significance (ICOMOS-Australia, 2013). The built environments of the traditional rural landscapes are generally designed to link directly and primitively to the functions of the spaces due to the practices. Consequently, they could not respond to the new needs of changed functions, which can result in more extensive interventions. Transition is inevitable, but the first aim should be to make the heritage alive with its authentic function and local inhabitants. Alteration of the habitus can decrease demand for specific public places, ultimately resulting in their discontinuation of use. Indeed, accepting a new religion can leave former religions' properties or technological developments can result in leaving the traditional production areas. Even if it is not the first preferred conservation approach, it can be the best alternative for the heritage at some point. If the property is not a monument and does not have a responsible institution for the protection, constant use is the essential method for maintenance. However, since humanity exists, housing has become one of their vital needs, and it has not changed. Therefore, even if the requirements for housing change, the need for shelter remains constant. The first approach for the rural landscapes as heritage should be to protect especially housing units with their original function. Housing units cover the vast majority of heritage properties, and their transformation can result in the loss of the values of the rural life and spirit of the area. As a result, this indicator assesses the degree of susceptibility decreasingly as abandonment, using the new and original functions.

SC.2 Sustainability of the Architecture: The built environment should provide the biological-physiological requirements besides the sociological-phycological ones of the owner. Therefore, the term sustainability in this criterion examines both physical integrity and space organization and functions of the rural landscapes as heritage. The

sustainability of the built environment will be assessed according to their compensation capacity to today, ease of maintenance, and usage status indicators (Table 4.3).

Table 4.3 SC.2 Sustainability of the architecture criteria decision structure

code	criteria	code	indicators	ranking alternatives
SC.2	Sustainability of the architecture	SI.4	Compensation to today	Space can fulfill the needs of today's comfort conditions. Space can fulfill the needs of today partially. Space cannot fulfill the needs of today.
		SI.5	Ease of maintenance	very bad poor moderate satisfactory very good
		SI.6	Usage status	Space is not used. Space is used for a new function. Space has been used for its original function.

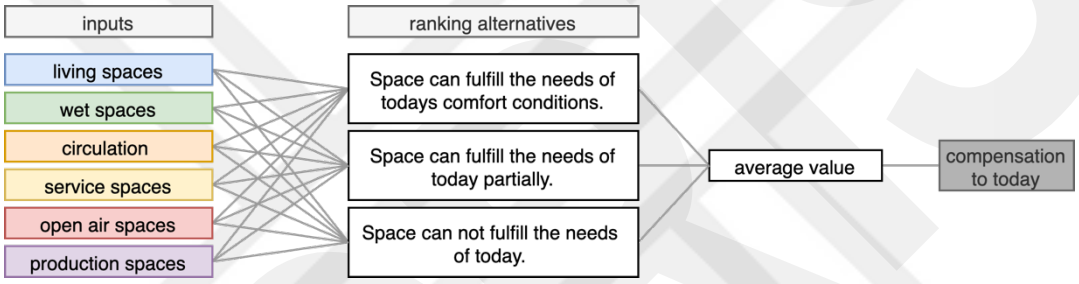


Figure 4.3 Compensation to today indicator value assessment tree

The habitus created over the years as a part of history is not static and opens the change (Bourdieu & Wacquant, 1992). These changes cause challenges in plan organization and circulation, privacy, life standards, material, form, and meanings of the built environment (Rapoport, 2006). Today's rural landscapes as heritage areas were formed years ago as a consequence of the outdated needs of vernacular life. The habitus transition and technological improvements emerge new practices, way of life, and user requirements. Since the spaces of vernacular architecture depend directly on production, social, and cultural habits, the transition of these habits due to technology, natural factors, etc., brings about new generation demands for living. Hence, the hardness of the compensation to the modern requirements makes the rural landscapes susceptible to the change hazards. The RUHET offers to evaluate each space or function of the rural heritage properties individually and calculate their average as the result of this indicator. In general, living (living and bedroom), service (hayloft and barn), production (workshops), open-air (balconies, courtyards, and terraces), wet (kitchen, bathroom, and toilets), and circulation spaces can be listed for the spaces needs to examine. The executor

should be aware of the context of the heritage and create its own spaces list due to the vernacular features of the site. After comprehending the authentic usage of the heritage, the indicator can be discussed in the following three options. The options gradually, from the worst to the best, are that the space cannot answer the needs of today's comfort conditions or can answer partially or totally (Figure 4.3).

The second indicator of sustainability of the architecture criterion is the ease of maintenance of the built environment of the rural landscapes as heritages. As referred to in the former indicators (CC.3), constant maintenance is the most beneficial activity for cultural heritage conservation. Each structure, specially built with natural materials, has deteriorated due to climate conditions and aging. Unlike construction systems produced with modern technology, vernacular structures built with traditional knowledge, human labor, and natural materials tend to require more maintenance. At the vernacular heritage, traditional laws and customs should guide the maintenance (ICOMOS-Australia, 2013). Considering cost, time, and labor, the ease of maintenance makes the structure more resilient to the changes mentioned. On the other hand, the difficulty of it may lead to either the deterioration of elements and then their replacement with new technology systems or the user being unable to cover the maintenance costs and abandoning the structure. The ease of maintenance practices for the building elements should be assessed, and the average of these values should be accepted as the outcome indicator. Likewise, the former indicators assessment should be made according to the context of the heritage, considering user feedback and conducting a detailed analysis of system maintenance. The options vary between very good to very bad scales. Since the maintenance application of construction systems and users' perspectives (whether it is easy or hard) on them vary within each settlement, the assessment is left to the executor's opinions.

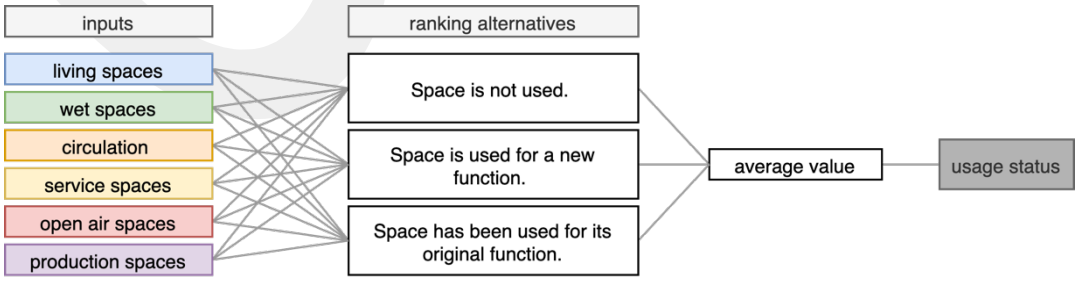


Figure 4.4 Usage status indicator value assessment tree

The last indicator for assessing the sustainability capacity of the architecture is usage status (Figure 4.4). When a space cannot compensate for the new demands, new

function needs occur, or old functions are abandoned, usage of spaces can change. Just as the function changes in the adaptive reuse projects, usage changes in the spaces can cause a loss of cultural heritage value and significance. Demolition of the original fabric during the changes is unacceptable because all components of the cultural significance of the heritage are valuable (ICOMOS-Australia, 2013). The usage status has been considered from three aspects. The first and most ideal scenario for a rural heritage is for the spaces to continue being used for the same function. In this case, interventions can be kept on a smaller scale and do not cause damage to the fabric of the heritage. Such small-scale interventions are necessary for making the structures livable (ICOMOS, 1999). The second scenario involves a change in the function of the space for various reasons. Function alteration can lead to a shift in the meaning of the space and may require some interventions. Especially in spaces where production is involved, this change can reach a dangerous extent that may jeopardize the cultural significance of the spaces. The last and least acceptable scenario is the non-use of the space. Abandoned spaces that are not regularly maintained lose structural integrity over time and eventually turn into ruins. Just like in the SI.4 indicator, it is necessary to individually assess all spaces of the examined cultural heritage and consider the average as the value for the usage status of the structure.

SC.3 Current Situation: The current situation reflects the physical performance and preservation condition of the heritage. The intervention need caused by the problems experienced in the current state makes the structures more susceptible. This criterion is examined through two main factors: heritage deterioration and interventions (Table 4.4). The structure's deterioration leads to large-scale interventions, while uncontrolled interventions encourage the user towards further ones. Therefore, the current state is considered a vital vulnerability criterion. Interventions are inevitable in living rural heritage areas, but these applications should be carried out while considering cultural heritage values. ICOMOS Turkey Architectural Heritage Conservation Charter defines applications and regular maintenance frames as the preservation process of architectural heritage, encompasses stages such as documentation, research, analysis, interpretation, diagnosis, and the establishment of conservation methods, as well as defining intervention measures for implementation and monitoring activities. It is essential to have professionals from relevant fields participate in this process. Considering that each cultural asset has unique characteristics, issues, and potential, studies related to the examination, documentation, evaluation, and definition of conservation interventions for

this precious and diverse heritage should be specific to the structure while adhering to universal approaches (ICOMOS-TÜRKİYE, 2013).

Table 4.4 SC.3 Current situation criteria decision structure

code	criteria	code	indicators	ranking alternatives
SC.3	Current situation	SI.7	Deteriorations	Deteriorations cause to loss of the traditional form and facade organizations. Deteriorations cause the alteration of the form and facade . Deteriorations cause the alteration of spatial organization. Deteriorations affect the system of the element. Deteriorations affect the material of the element.
		SI.8	Inappropriate intervention	Interventions cause to loss of the traditional form and facade organizations. Interventions cause the alteration of the form and façade. Interventions cause the alteration of spatial organization. Interventions affect the system of the element. Interventions affect the material of the element.

The heritage's current condition will be determined by evaluating all building elements, systems, ornamentation, and traditional furniture. The condition of these elements will be assessed on five-point levels. These levels have been established to assess the state of preservation following contemporary conservation principles and intervention guidelines outlined in international texts. As emphasized in the Valetta Principles and the ICOMOS Turkey Architectural Heritage Conservation Charter, maintenance and restoration procedures do not threaten the heritage value when using local materials and traditional techniques. The first and best situation is the alteration of the building material only. The second scenario involves damage to the system of the building element. Architectural preservation encompasses the entirety of heritage properties and cannot be reduced to its outward appearance alone. The value of architectural heritage lies not only in its visual aspects but also in preserving all its components as a unique example of the construction technology of its time (ICOMOS-TÜRKİYE, 2013). Therefore, any alteration or damage to the original system of building elements due to deterioration or interventions can impact the heritage.

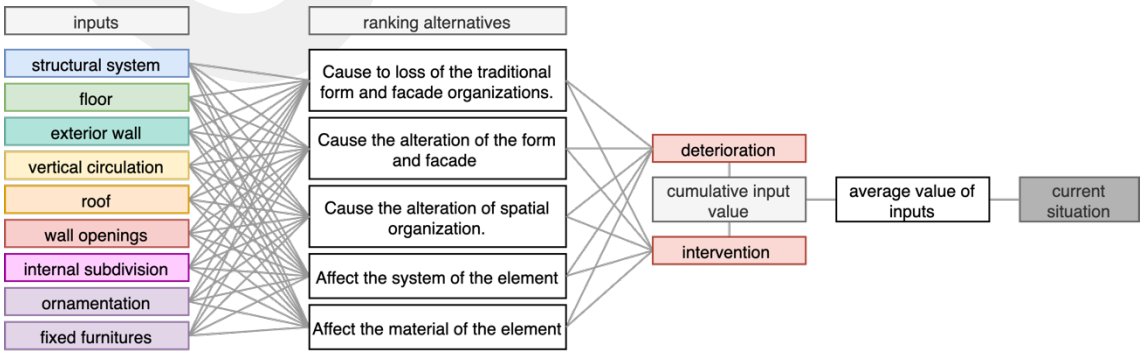


Figure 4.5 Current situation indicator value assessment tree

The third-degree level of the current situation makes the heritage susceptible to the alteration of spatial organization. Changes that building elements systems undergo due to interventions or abandonment can alter spatial organization, disrupt the perception of spaces, affect their meaning, and alienate them from their original use. The fourth and fifth scenarios are related to altering the heritage's form and facade characteristics. The condition that leaves the heritage most vulnerable is when the form and facade of the building become entirely unrecognizable, losing their meaning and cultural significance. The cultural values of heritages are formed by their use of meaning and construction systems reflecting different periods, and it is unacceptable for this fabric to be permanently damaged (ICOMOS-Australia, 2013). Therefore, the fifth alternative, which leaves the structures most vulnerable, is defined as altering the form and facade characteristics of the building to the point of eliminating its fabric.

Building element systems can be analyzed by separating their components, as shown in Figure 4.5; thus, a decision can be made regarding how they affect the heritage. It is recommended to conduct a current situation assessment using a work matrix, as shown in Table 1. The structural system, one of the most crucial features of a structure, can be evaluated in terms of dimensions, materials, components, and stability to make an informed decision. For this, it is necessary to thoroughly understand the properties of the structure and materials in conservation practices. Information about the initial construction of the structure, conditions before the present day, techniques used in construction, alterations and their effects, events experienced, and the current state is required (ICOMOS-TÜRKİYE, 2013). If the cultural heritage is a building, elements such as the floor, external wall, vertical circulation, roof, wall openings, and internal subdivision should be examined in detail according to system, material, and form. In addition, traditional fixed furniture and ornamentations, which are specific to the place and are part of the fabric, should be included in this list. Since these evaluations will also be conducted on rural heritage components outside of building groups, the building elements may vary, and the executor should make this decision. In the detailed examinations, deteriorations and interventions should be scored based on the damage they cause to the cultural heritage value, as described above. Alterations should be listed as deteriorations and interventions in the sample matrix, and the worst option should be accepted as the final result.

4.2.1.2 Coping Capacity

Just as WHO has drawn attention to, capacity means a collective amalgamation of the strengths and assets present in a community, society, or organization, which serve to mitigate risk or alleviate the impacts of a disaster. ISDR describes the coping capacity as "*The ability of people, organizations, and systems, using available skills, resources, and opportunities, to address, manage, and overcome adverse conditions*." (UN/ISDR, 2002). This part of the vulnerability assessment asks how a rural heritage can be managed to the habitus transition and which parameters can effectively cope with the hazards. For the rural heritage cope capacity assessment, four sub-criteria are decided by guiding international documents (Figure 4.2, Table 4.1). These criteria and indicators are not related directly to the heritage itself. These can be called external factors depending on administrative dynamics. Awareness, conservation actions, and current laws and regulations are primarily governmental managerial responsibilities, while institutional risk mitigation actions are related to risk management. While some indicators of the coping capacity can cover the whole rural site, others should be evaluated one by one for each heritage property. Executors should organize and control these indicators' applicability to their site context. Consequently, the RUHET aims to control the capability of the heritage to struggle and overcome hazards by managing and adapting.

Table 4.5 CC.1 Awareness criteria decision structure

code	criteria	code	indicators	ranking alternatives
CC.1	Awareness	CI.1	Awareness on threats that transformations cause	very good satisfactory moderate poor very bad
		CI.2	Awareness on the cultural rural landscape heritage sustainability	very good satisfactory moderate poor very bad

CC.1 Awareness: One of the most vital indicators of coping with threats in living heritage areas is the community's awareness of heritage and threats. This awareness shapes the conservation perspectives of the inhabitants, the local community, and the authorities. It is essential to raise awareness among the residents and local authorities about preserving the spirit of a place since this awareness will enable them to be better equipped to address the challenges posed by a rapidly changing world (ICOMOS, 2008). Conservation efforts begin with raising awareness of heritage and uncovering its values. On the other hand, risk assessments start with recognizing threats and continue with their

management. Therefore *awareness* criteria should assess the awareness on threats and cultural heritage (Table 4.5).

CI.1 Awareness of habitus transition hazard: With the evolution of the approach to conservating damaged structures in cultural heritage, shifting from intervention-based preservation to proactive preventive measures, the concepts of risk and resilience have gained popularity. Firstly, UNESCO, through its *Heritage in Danger* platform established in 1972, and then ICOMOS, with its *Heritage@Risk* platform created in 1999, drew attention to the risks. Identifying and recognizing risks are the former steps in determining intervention methods for answering conservation strategies. Establishing UNDRR and ICOMOS-ICORP has led to numerous definitions, classifications, and methods for identifying and managing risks.

In RUHET, heritage risk studies are considered while developing resilience strategies against the value loss of rural heritage areas in the face of habitus transformation. In all risk studies, the primary step is to determine the nature of the hazard and create awareness among relevant individuals, communities, institutions, and authorities. Being aware of the threat initiates the process of taking precautions, implementing risk management strategies, and consequently leading to the formation of resilient heritage areas. Risk can be assessed only with the function of hazard and vulnerability. Nevertheless, the first indicator of a lack of coping capacity is the awareness of the hazards.

Hazard can be described as the possible happening of a physical event, whether caused by natural forces or human actions, which has the potential to lead to loss of life, injuries, health consequences, as well as harm and destruction to property, infrastructure, means of living, service delivery, and the environment (IPCC, 2012b). According to UNESCO, cultural and natural heritage site risks are categorized as existing and potential risks, while ICOMOS classifies risks based on natural, social, and economic factors, including natural events, development/urbanization, social and collective behavior, and inadequate protection policies (ICOMOS, 2000; UNESCO, 2019). ICOMOS-IFLA describes increasing population and climate crises as having made rural heritage areas vulnerable to changes; they are classified as risks requiring preventive measures regarding demographic, cultural, structural, and environmental changes (ICOMOS-IFLA, 2017). The RUHET defines the transformation of habitus as a threat in rural heritage areas due

to the slow but inevitable damages it will cause, which is different from the previously identified threats to heritage.

Until today, studies have perceived natural or environmental factors that can lead to habitus change as threats but have overlooked the change of habitus itself. Habitus, which can also be defined as the context of a rural area, is in a dynamic and interactive relationship with rural heritage areas. Indeed, the power of this dynamic relationship to influence each other has been explained in previous sections. Therefore, the impact of a change in habitus on rural heritage areas should be controlled and guided. Otherwise, this transition must be considered a hazard. However, as mentioned above, in Turkey and worldwide, the effects of this transition have emerged gradually, so they have remained outside the definitions of potential threats. The hidden nature and lack of awareness regarding the factors that pose a risk can lead to irreversible consequences. Therefore, measuring the level of inhabitants, communities, and authorities' awareness regarding the adverse effects of habitat change in rural heritage areas is crucial. The efforts and measures taken, along with the propaganda and promotion related to this issue, should be influential criteria in the decision-making process. Accordingly, each sample area should be evaluated within its context, and one of the five values should be selected.

CI.2 Awareness on cultural heritage: Cultural heritage conservation is a comprehensive and complicated process with various actors, from locals to internationals. Understanding the cultural heritage values of these actors initiates conservation efforts. Promoting a property or a site as cultural heritage by explaining its values is crucial for coping with habitus transition risk. The awareness of cultural heritage, initiated with the Athens Charter in 1931, has grown over the years through local and international efforts and doctrinal texts, reaching the present day. These texts progressively created and developed the definition and perception of cultural heritage and knowledge. Differently from the monumental and archaeological heritages, rural, vernacular, or traditional architectures and sites became one of the leading conservation topics later in the societies. Integrated conservation can be provided by social development policies based on a well-balanced relationship between humans, nature, and heritage. Therefore, Granada Appeal suggests using communication to create public awareness and involve them in conservation (COE, 1977).

Together with the laws and regulations, the primary conservation actors are the communities. Their training, from the children to the older ages, is one of the critical issues of the determining lack of coping capacity. While the Florence Charter (ICOMOS, 1982) offers to operate some media tools to develop heritage awareness, The Charter on the Built Vernacular Architecture (ICOMOS, 1999) provides some programs, especially for young generation training and the contributions to the conservation of the locals' and stakeholders' awareness are emphasized in the 17th ICOMOS General Assembly, 2011 (ICOMOS, 2011b, 2011a). The Florence Declaration on Heritage and Landscape as Human Values claims the issue; *"A community with highly-developed cultural awareness and the capacity to identify unique cultural values within their community is in a position to be empowered to protect the integrity, authenticity, and continuity of the cultural heritage recognized within that community….Sustainable conservation and safeguarding intangible cultural heritage in a local tourism context can be achieved only by fostering awareness, in-depth knowledge, and understanding among local communities of the significance of their heritage and diverse influences that have come together to create – and continue to create - a unique culture."* (ICOMOS, 2014). As we can infer from these texts, rising awareness of users, locals, tourists, institutions, stakeholders, or governmental groups fundamentally affects heritage conservation. Conservation starts with the direct users of heritage and the surrounding community even before the government's involvement. User awareness is crucial, particularly in rural areas where tangible and intangible values are closely connected to the local users. The user's understanding of the cultural components they continue to live with and their awareness of architectural and landscape elements enables them to exercise self-control in their interventions and contribute to preserving the necessary living culture and the spirit of the place. The lack of a specific definition for rural landscapes as heritage in Turkey and the continued classification of rural sites as urban have made it difficult to perceive this heritage category. ICOMOS and IFLA published Principles Concerning Rural Landscapes as Heritage in 2017 and offer the recognition, identification, and promotion of the values of rural landscapes with tangible and intangible components for ensuring sustainable conservation through community awareness. Collaborative participatory activities related to rural landscapes as heritage can help to expand the knowledge of traditions, practices, and construction technology (ICOMOS-IFLA, 2017).

These discussions represent the contribution of the rising awareness of a rural landscape as heritage. The model offers five steps and values for evaluating the *"CI.2 Awareness on cultural heritage values of the rural landscape as heritage"* as one of the indicators of lack of coping capacity assessment. The decision of the degree selection is left to the executor. They need to decide through the cultural heritage-promoting activities made till the decision date. The activities like education facilities, workshops, festivals, NGOs, publications, or advertisements help to constitute community awareness. Each heritage property has its characteristics and needs to be evaluated in context. According to countries' regulations and heritage conservation activities, decision-makers can assess whether the cases are sufficient for raising community awareness in their context.

Table 4.6 CC.2 Conservation actions criteria decision structure.

code	criteria	code	indicators	ranking alternatives
CC.2	Conservation actions	CI.3	Conservation actions in the urban plan	The heritage is within the urban conservation plan's boundaries, and there are satisfactory actions. The heritage is within the urban conservation plan's boundaries but lacks action. The heritage is in the boundaries of interaction and transgression zone. The site was planned as a development area and was not taken any action for conservation in the urban plan. The site is not within the boundaries of any urban plan.
		CI.4	Legal status	The heritage is registered as 1st degree. The heritage is registered as 2nd degree. The heritage is registered as 3rd degree. The heritage is not registered individually but in the heritage site boundaries. The heritage is not registered.
		CI.5	NGO's conservation actions	Actions taken by NGOs are adequate. Actions taken by NGOs are inadequate. Any conservation action is taken by NGOs.
		CI.6	Cooperation with international organizations	The settlement is in the boundaries of a site registered by international organizations. International organizations are aware of the settlement but the support is not enough. International organizations are not aware of the site.
		CI.7	Governmental risk mitigation actions	Governmental risk mitigation actions protect the heritage from the risks. The government is aware of the risk but taken actions are insufficient. The government is not aware of the change risks in the rural heritage areas.
		CI.8	Rural landscape sustainability guide	The guide contributes to sustain rural landscape and its production. The guide is developed but insufficient for the resilience of the landscape. A guide for the sustainability of the rural landscape has not been developed.
		CI.9	Rural heritage conservation guide	The guide contributes to sustain rural landscape and its production. The guide is developed but insufficient for the resilience of the heritage. Guide is not developed.

CC.2 Conservation Actions: Governments are primarily responsible institutions for conserving cultural heritage and have a vital role. By enacting laws and regulations, they have the ability to establish rules and develop their conservation strategies. First, they need to describe the cultural heritage livingly in accordance with the international developments in the field. Then, the precise definition of the conservation process, identification of authorities and regulations, and implementation of management plans enable smooth operation and execution. Governments, together with the support of national and international intuitions and NGOs, carry out cultural heritage management for resilience. In summary, rural landscapes as heritage should be clearly defined and protected through policies, laws, and regulations (Table 4.6). Following this, risk management strategies must be developed to ensure resilience and safeguard these valuable assets.

CI.3 Conservation Actions in the Master Plan: Cultural heritages emerge within a specific context and survive in these complex urban or rural environments. At the beginning of the world, these environments are created organically, together with nature, and without specific planning. With the transformation of urban living with new technologies and the enlargement of settlements with industrialization, cities become more complex. The urban planning science has emerged inevitably, and cities are organized with master/development plans. The development plan is a flexible and forward-looking document offering a conceptual framework to direct future expansion and development of the cities. It offers land use, population, or economic alternatives for the relationship between the buildings, social settings, and close environment. In these circumstances, the plan covers developing strategies for the heritage sites and close surroundings as a part of the city. Simultaneously, heritage sites, their surroundings, and even the city need to be designed due to heritage value, definition, and legal status.

The definition of cultural heritage has changed and evolved as more complex over time due to the annual discussions of ICOMOS, UNESCO, COE, etc. The initial definition only included a monumental historic building, and today, it consists of a site that covers both tangible and intangible assets and the surrounding in which it emerged. Today, ICOMOS prefers to call “cultural property” instead of “historic monument,” while UNESCO chooses “cultural heritage.” The changing perception of heritage terms gradually affected the rules of the development plans and cities. These developments bring up the “cultural landscape” and “rural landscape as heritage” terms. The authorities

have started to add these definitions to their conservation rules and managed some plans for their resilience. Otherwise, these valuable areas, which represent the local and vernacular traditions, living and producing habits, architecture, and landscape, will disappear and lose their value under the urban life influence.

In addition to the development plan precautions, cultural heritage sites can be protected with a conservation-oriented zoning plan or in the boundaries of any other heritage's interaction and transgression zone. In light of these issues, governments develop their own regulations, laws, and urban master plans for managing heritage areas. The RUHET offers five main steps for deciding the effect of the master plan in the lack of cope capacity criteria. The worst scenario for a rural heritage landscape is having no zoning or development plan boundaries. Indeed, in such a case, the area will remain undefined and completely uncontrollable. Secondly, the area can be in the development area boundaries, and the new and modern city can enlarge to the heritage site periphery. Being in the interaction and transgression zone and conservation-oriented zoning plan should be valued gradually. The executor needs to decide whether the actions taken are satisfactory or not according to the process.

CI.4 Legal Status: Governments accelerated studies on cultural heritage conservation and established some management organizations together with adopting the *"Convention Concerning the Protection of the World Cultural and Natural Heritage"* by UNESCO (Table 4.1). The convention recommends developing policy for integrating heritage into the planning program and community life and serving some governmental services to these issues (UNESCO, 1972). Legal and Administrative ones are the fundamental precautions and should be strengths for effective conservation actions. The international consensus on heritage and international text leads governments to take measurements in legal ways. Even the awareness of the community can contribute to the protection of the heritage; the administrative process can deter inappropriate interventions, vandalism, or other threats from individuals or even governments. Similarly, in the UNESCO World Heritage List process, every national cultural heritage management system should define its different levels and types of criteria to list the properties. In general, the classes can be monuments, sites, and intangible heritages in several stages, which can be decided according to the value of the items. National governments have their evaluation methods developed according to international texts, agreements, and cultural traditions for registering their heritage. The RUHET offers five

steps for evaluating the legal status value in the lack of cope capacity criterion. The worst situation for cultural heritage properties is having any protection by registrations. In the second alternative, the property cannot be registered individually but within the boundaries of any registered heritage site. When a rural heritage site is registered, the registration rules offer protection for individual heritage items. Other steps should be decided according to the registration degrees of the properties.

CI.5 NGO's Conservation Actions: Near the government and community, NGOs have required support on cultural heritage conservation, resilience, and promotion. NGOs are non-governmental organizations that are worked by voluntary groups independently. COE recommends promoting effective collaboration and engaging with voluntary organizations and the private sector at suitable levels is important (COE, 1990) (Table 4.1). Governments should respect and encourage the voluntary groups and organizations concerned with the spotlight of public interest in heritage conservation. They can aim to increase awareness regarding the significance of heritage, the necessity for its preservation, and the potential benefits it can offer (COE, 2005). This indicator can be evaluated in three steps: any, inadequate, and adequate actions. The executor must choose appropriate options according to the national and international context. Each heritage site includes its dynamics, and executors are responsible for consensus on whether the NGOs' activities are enough or need to be enhanced.

CI.6 Cooperation with international organizations: Leading UNESCO, international organizations have started, and several organizations have been established to focus on preserving, protecting, and promoting cultural heritage. Primarily, UNESCO, UN, ICOMOS, and COE led the studies and developed the perception of the heritage (Table 4.1). Organizations published conventions, recommendations, principles, and charters, and governments joined and agreed to these. Besides developing ideas on the topic, these organizations have some registration systems and take serious conservation actions, even financial support between the members. Therefore, the support of international organizations can promote the heritage, raise public and global awareness, help develop management policies, and support the conservation process. The first and most crucial registration system is the *"UNESCO World Heritage List."* At the General Conference of UNESCO in 1972, with the *"Convention Concerning the Protection of the World Cultural and Natural Heritage,"* cultural heritage was accepted as a common concern of the world (UNESCO, 1972). They offered to create a world heritage list

according to the defined criteria. Today, this list is universal consent and provides many opportunities to the selected ones. There is a UNESCO tentative list; the offered heritage properties are generally accepted firstly to this list, and due to the management strategies and values of the item, it can be taken on the main list. Today, many international organizations have study groups that can provide support in different fields. Governments make efforts to join these lists or support groups and stay in them. These efforts result in comprehensive conservation management, actions, and studies with the local and international community. Consequently, cooperation with international organizations is inevitable to evaluate institutional mitigation actions' contribution to the lack of coping capacity. Similarly, there are three steps for value evaluation. The most unfavorable scenario is not being noticed by any international institution. The best scenario is being registered by UNESCO as a World Heritage and noticed by other organizations.

CI.7 Governmental risk mitigation actions: After the awareness of the risks mentioned above, risk mitigation actions should be prepared by governments. The study and the RUHET focus on the resilience of the rural landscapes as heritage due to the habitus transition. Resilience studies aim to identify risks by hazard and vulnerability assessment. Decreasing the risk and protecting and sustaining the cultural heritage through comprehensive management is the fundamental issue in resilience. Governments need to constitute a working group, decide the administrative process, and create a risk management guide. They can operate measurements and create regulations about the issue. As a context of the RUHET, the habitus transition threat and the risk it poses should be controlled by actions, laws, regulations, or guides, and the executor needs to measure the indicator due to these actions.

CI.8 Rural landscape sustainability guide and CI.9 Rural landscape heritage conservation guide: After the awareness of the heritage and risk and organizing the legislative process of the heritage with international support, guides for the rural landscapes as heritage should be prepared. Natural aspects with built and unbuilt landscapes are fundamental to rural areas. This nature shapes the practices, economy, architecture, and settlements. The natural transition causes the most dramatic changes in the settlements and locals. Sudden or slow natural changes can affect tangible and intangible heritage properties of rural. As a heritage and a heritage maker, natural environments are valuable and should be protected and managed.

Each heritage area is unique and needs specific interventions and conservation strategies. General laws, regulations, or decisions cannot offer comprehensive conservation solutions for each rural heritage. Preparing a guide that should provide determined answers according to the discussions of experts, NGOs, international organizations, governments, and the community is essential. An appropriate and effective management system should be developed due to heritage type, characteristics, and cultural and natural context (ICOMOS, 2011b). A management guide should include recognizing, conserving, sustaining, and developing strategies for tangible and intangible features of a specific cultural heritage. As indicators of the institutional mitigation actions criteria, two guides can focus on the sustainable natural environment and rural heritage conservation, or one can cover both of these issues. Suppose there is any guide about the aforementioned topics for a case rural landscape. In that case, the Executor should review the situation context, approach them, and decide whether they are insufficient or sufficient. Thus, the value of the indicators can be chosen.

CC.3 Current laws and regulations:

Governmental authorities have a vital responsibility for cultural heritage conservation through laws and regulations, which have the capability to establish rules and organize conservation strategies. For this reason, the Current laws and regulation sub-criterion have primary and inflexible effects on the protection of rural heritage sustainability. The rules should be organized into two indicators: rural heritage conservation actions and transition risk management actions (Table 4.7).

The government's laws and regulations should be prepared to preserve a place's identity without impeding its development, encompassing tangible and intangible elements. The established rules should be comprehensive, addressing all cultural heritage areas in detail within the linguistic and action coherence framework. Rural heritage sites should be defined in the laws as wholly natural, built, and intangible features. For example, in Turkey, The legal categorizations of heritage sites currently only include descriptors such as "historic urban," "archaeological," and "complex" sites. Rural landscapes, which integrate architectural and natural elements, embodying cultural and natural resources, fall under the classification of "complex sites." However, managing them has become challenging due to the legal division between cultural and natural heritage (Elagöz Timur & Baturayoğlu Yöney, 2020).

The ICOMOS-IFLA recommends examining and executing legal and policy structures aimed at promoting biocultural sustainability and resilience during the utilization and alteration of rural landscapes, considering global, national, and local threats, risks, and opportunities (ICOMOS-IFLA, 2017). Near the conservation of rural heritage by-laws, the RUHET model indicates the power of emphasizing the habitus transition as a threat. Governments and authorities should consider the change as a threat to the cultural heritage in addition to natural disasters.

Table 4.7 CC.3 Current laws and regulations criteria decision structure

code	criteria	code	indicators	ranking alternatives
CC.3	Current laws and regulations	CI.10	Rural heritage conservation actions	Current laws and regulations are efficient Current laws and regulations are not efficient There are no laws and regulations regarding rural heritage
		CI.11	Transition risk management actions	Current laws and regulations are efficient Current laws and regulations are not efficient There are no laws and regulations regarding transition risk management

CC.4 Institutional risk mitigation actions:

Table 4.8 CC.4 Transition risk mitigation actions criteria

code	criteria	code	indicators	ranking alternatives
CC.4	Transition risk mitigation actions	CI.12	Risk action plan	The risk action plan is efficient. The risk action plan is not efficient. There is no risk action plan regarding transition.
		CI.13	Risk management plan coordinator	Cultural heritage risk expert(s) is selected as the coordinator. Local person(s) is selected as the coordinator. There is not a coordinator.
		CI.14	Risk management plan implementation audit	An audit mechanism is organized by defining personnel. An audit mechanism is not organized.
		CI.15	Disaster risk management training	Training for transition risk in rural heritage is efficient. Training for transition risk in rural heritage is not efficient and widespread. There is no training provided for transition risk in rural heritage.
		CI.16	Cooperation between heritage organizations and disaster management	Cooperation between heritage organizations and disaster management is efficient. Cooperation between heritage organizations and disaster management is not efficient. Cooperation between heritage organizations and disaster management is not efficient.
		CI.17	Information and communication system	A system is generated for information and communication regarding risk management. There is no system for information and communication regarding risk management.
		CI.18	Financial resources and risk compensation mechanism	Financial resources are adequate for the transition risk mitigation. Financial resources are inadequate for the transition risk mitigation. There are no financial resources or compensation mechanisms.

Near the conservation actions, risk actions for mitigation and management planning are too critical for strengthening the capacity of rural heritage. Therefore, this criterion is

critical for the consideration of enhancing the managerial capacity of rural heritage sites against the risk. In every discipline, risk studies require implementing mitigation actions to control and maintain resilience effectively. After comprehending hazards and cultural heritage exposure, mitigation strategies should be defined and applied. Even if hazards cannot be prevented entirely, mitigation actions significantly reduce the risks. This part of the model questions starts from the risk action plan, coordinators, and audit for implementation and continues with the organizational requirements with the risk mitigation (Table 4.8).

Over the years, it has been understood that the concept of "crisis management," which primarily involves intervention and assistance, needs to be changed, especially following major disasters worldwide. Therefore, a shift has been made towards the "Risk Management" model, which focuses on calculating risks before disasters occur and taking necessary precautions. In order to prevent the damages caused by disasters, efforts have begun to create risk management plans that prioritize identifying hazards and risks before disasters occur, taking measures to prevent or minimize damage, and ensuring effective intervention and coordination. Risk action plans are essential because they provide a structured approach to identifying, assessing, and managing risks within an organization, project, or community. This thesis study highlights the hazardous results of the habitus transition in the rural heritage and calls for a risk action plan through the assessment of the *CI.12 risk action plan* indicator.

This study does not address an emergency situation because it deals with a threat that develops cumulatively over time rather than suddenly and unpredictably, as in a disaster situation. However, it does require experts to monitor the threat and implement the plan. At every stage, from decision-making to implementation of the plan, the presence of a conservation expert or group is necessary. The presence of a conservation expert is crucial for managing the threat, reducing the vulnerabilities of heritage, and implementing conservation measures. Another significant role in this process is the establishment of a mechanism to oversee all these practices. However, with the implementation of a regular monitoring system to be determined along with the plan, the risks to rural heritage areas can be reduced.

Disaster management is a collective effort. This process, which begins with the efforts of authorities, can only be accomplished through the participation of all

stakeholders, including heritage owners, local communities, experts, and NGOs. The collaboration of these stakeholders is achievable through training sessions provided on the subject. Therefore, the involvement of stakeholders is a critical indicator in capacity discussions regarding rural heritage areas. ICOMOS-IFLA lists the necessary training as follows:

- "*Education programmes for conservators in the principles of the vernacular;*
- *Training programmes to assist communities in maintaining traditional building systems, materials and craft skills;*
- *Information programmes which improve public awareness of the vernacular especially amongst the younger generation.*
- *Regional networks on vernacular architecture to exchange expertise and experiences.*" (ICOMOS-IFLA, 2017).

4.2.1.3 Adaptive Capacity

Resilience is related to adaptation to performing activities even if they need to change, so coping and, accordingly, adaptive capacity research cannot be underestimated. Adaptive capacity refers to the capability of a system to adapt to current or anticipated hazards and influences by factors such as wealth, technology, education, information, skills, and infrastructure (Birkman, 2006). The IPCC SREX report distinguishes between adaptive capacity and coping capacity. While adaptive capacity refers to the combination of strengths, attributes, and resources available to individuals, communities, or societies to mitigate impacts and harm, coping capacity, on the other hand, is defined as the ability to effectively utilize available skills and resources to manage and overcome adverse effects (IPCC, 2012b). In the RUHET, AC.1 State of conservation capacity and AC.2 Resources accessibility criteria cover investigating the ability to reduce hazardous effects. The state of conservation capacity can be explained depending on economic, ecological, and socio-cultural results; in contrast, resource accessibility depends on governmental developments.

AC.1 State of Conservation capacity; This criterion will question the sustainability possibility of the rural heritage. In this context, the goal is to measure the physical continuity of the existing architectural and landscape elements when a conservation study is involved. Since the conservation approaches, if possible, firstly defend to sustain the

authenticity. The NARA document describes the sources of authenticity as follows; *"Depending on the nature of the cultural heritage, its cultural context, and its evolution through time, authenticity judgements may be linked to the worth of a great variety of sources of information. Aspects of the sources may include form and design, materials and substance, use and function, traditions and techniques, location and setting, spirit and feeling, and other internal and external factors. The use of these sources permits elaboration of the specific artistic, historic, social, and scientific dimensions of the cultural heritage being examined."* (ICOMOS, 1994). The first aim of the conservation should survive to these sources and then search for alternative ways. This criterion evaluates the physical adaptivity of the heritage by values of 5 indicators: Traditional construction/production knowledge, Sustainability of vernacular/traditional material, Affordability of using traditional technics and technologies, Developed modern methods for conservation, and Documentation and literature studies (Table 4.9).

Table 4.9 AC.1 State of conservation capacity of heritage criteria decision structure

code	criteria	code	indicators	ranking alternatives
AC.1	State of conservation capacity	AI.1	Traditional construction/production knowledge	All traditional technics and technologies are documented and known by common. All traditional technics and technologies are known by the locals. Several technics and technologies have disappeared. Most technics and technologies have disappeared. Traditional construction knowledge has disappeared.
		AI.2	Sustainability of vernacular/traditional material	All materials can be produced at the site or near the environment for a long period. All materials can be produced at the site or near the environment for a short period. Materials can be found at remote quarters. Vernacular material of traditional construction systems has disappeared.
		AI.3	Affordability of using traditional technics and technologies	Cheaper than modern methods Approximately similar with modern methods Reasonably expensive than modern methods Dramatically expensive than modern methods
		AI.4	Developed modern methods for conservation	Developed methods are sufficient for sustainable heritage site. Developed methods are insufficient for the sustainable heritage site. Any modern method is developed for the conservation.
		AI.5	Documentation and literature studies	There are literature studies and documentation about the heritage. There are literature studies about the heritage. There are literature studies and documentations only about the site There are no literature studies and documentation about the site and the heritage.

AI.1 Traditional construction/production knowledge: This indicator will discuss whether traditional construction and rural production techniques knowledge has disappeared or survived. Continuing knowledge about construction techniques, materials, and the production and usage of these are prerequisites for the maintenance, restoration, and, if necessary, adaptation of architectural heritage. In the case of losing this

knowledge, it's impossible to discuss a conservation approach that can preserve authenticity. This accumulation of skills itself can even be acknowledged as a heritage value. As suggested by the Nara Authenticity Principles, each heritage is unique. Since heritage emerges in a habitus that is shaped by it simultaneously, and the diversification of social and natural factors that constitute the habitus, various architectural and landscape elements as heritage is inevitable. The entire body of knowledge that creates an authentic rural landscape, from the materials and construction systems to the methods of generating built environments (both architectural and landscape, in open and enclosed spaces), as well as agricultural production and post-production processes, should be passed down to future generations. Through the transfer of these skills, traditional life and production practices can continue, enabling sustainable heritage conservation. The settlements, especially under the habitus changing threat, need to act to prevent the knowledge's oblivion. Faro Convention suggests some actions in the "Cultural Heritage and Knowledge" article;

"The Parties undertake to:

a facilitate the inclusion of the cultural heritage dimension at all levels of education, not necessarily as a subject of study in its own right, but as a fertile source for studies in other subjects;

b strengthen the link between cultural heritage education and vocational training;

c encourage interdisciplinary research on cultural heritage, heritage communities, the environment and their inter-relationship;

d encourage continuous professional training and the exchange of knowledge and skills, both within and outside the educational system." (COE, 2005). Accordingly, this indicator is significant in assessing the integrated conservation capability of the rural landscapes as heritage. There is five degree that the executor should decide due to the case site studies and observations. Executors must evaluate both the construction and production activities. The worst scenario is the loss of traditional construction or production knowledge. In addition, the best situation is that the techniques are known not only by the locals but even by the common.

AI.2 Sustainability of vernacular/traditional material: One of the sources of the authenticity evaluation is the material. As a living metabolism, the rural heritage areas continue to exist with constant maintenance and construction. If possible, the conservation approach offers to recover and use the original material, but in other cases, it is vital to use the same vernacular/traditional material for the construction. Rural architecture, settlement morphology, and landscape are shaped basically as a result of geography and vernacular production. If necessary, materials and methods can be taken by neighborhood areas in years, and these can be called traditional materials. These activities create a typology, vernacular architecture, and, consequently, rural landscapes as heritage. Therefore, the material's sustainability is inevitable for conserving the rural heritage. Burra Charter draws attention to the term *"fabric"* and the importance of using traditional materials to protect cultural significance (ICOMOS-Australia, 2013). Together with natural changes like climatic changes and depletion of resources, economic and demographic changes like lack of material production can reduce the traditional material. The worst situation is the disappearing vernacular material of traditional construction systems. The second is getting the material scarcely from remote quarters. The best option for the sustainable cultural significance of the rural landscapes as heritage is reaching traditional materials from the own heritage settlement with long-term production capacity. The executor should first document the traditional construction material of the selected rural landscape and continue with the evaluation of the capacity of each. The average of each material sustainability value shows the value of the indicator.

AI.3 Affordability of using traditional techniques and technologies: Rural landscapes are commonly built with a limited budget, with vernacular and easily reached materials and methods. For that reason, the affordability of traditional construction is one of the significant effects on the sustainability of the rural fabric. According to the economic circumstances of the area, users can prefer the cheapest alternative and transform the heritage uncontrolled. Especially in areas not registered or protected by any regulations, it can lose its traditional fabric and, accordingly, cultural heritage values by using inappropriate materials and methods. The scarcity of natural materials, handcraftsmanship, and hardness of the traditional methods, together with the technological developments in construction science and mass production, caused the creation of cheaper materials and easier methods with technology. Finding more affordable and easier construction than vernacular ones can give rise to a loss of

authenticity. For the above reasons, the affordability of using traditional techniques and technologies is the critical indicator for assessing the State of Conservation capacity. The executor should analyze all economic opportunities of traditional materials and methods and choose one option from 4 alternatives.

AI.4 Developed modern methods for conservation: Starting from the Venice Charter (1964), doctrinal texts suggest using modern methods when the vernacular technologies are insufficient for the required intervention. Nevertheless, using the new techniques in the heritage can be possible only if experts develop the strategies. The utilization of contemporary materials and methods should be backed by solid scientific proof or a substantial body of practical knowledge (ICOMOS-Australia, 2013). Contemporary usage demands and acceptable changes can be made with materials that are harmonious with the overall expression in terms of appearance, texture, and form without being discordant; care should be taken for the compatibility of building materials (ICOMOS, 1999). New construction technologies can offer effortless and cheaper materials and techniques; uncontrolled interventions with these give rise to heritage loss. The heritage conservation thoughts permit the use of alternative methods and materials in the mentioned rules. With a comprehensive and interdisciplinary analysis, the site's needs for new technologies should be decided by experts, and new construction and production processes should be defined. Only in that way, while heritage conservation can be achieved, the site's and users' needs can be answered. The executor should examine whether there is any research, thesis, article, report, or guideline that develops and suggests modern methods. According to the results, executors should discuss the capability of the developed methods and choose an appropriate alternative in the given context.

AI.5 Documentation and literature studies: Conservation starts with survey and documentation since each intervention for maintenance or new adding should be programmed in harmony with the authentic version. Charter on the Built Vernacular Heritage states that undertaking any physical alterations to a vernacular structure must be approached with caution and requires a comprehensive analysis of its form and structure beforehand (ICOMOS, 1999). This documentation should be stored in an archive accessible to the general public. For the rural landscapes as heritage, documentation should be examined holistically, covering tangible and intangible aspects and natural and built environments starting from micro to macro scale. These recordings both guide the

conservation actions and increase the conservation capacity of the heritage. With a survey and documentation, it is possible to mention heritage conservation. To uncover the studies on the case rural site, the executor should research governmental, municipal, or NGO together with literature studies. The evaluation of this indicator should examine the properties by property so the alternative values are created according to it. The best alternative is to have detailed documentation for both the site and the heritage item. The other options are listed gradually till they have any documentation studies.

AC.2 Resource accessibility: Since early times, people have paid attention to locating settlements near the resources. While In the beginning, primitive needs like water sources or sewage were determinants, now, due to the contemporary life needs, different resources accessibility can be determinants for selecting a rural area for living. To find a balance in sustainable heritage conservation, the required resources should be provided to the rural landscapes to keep an adapted and qualified life for inhabitants. The quality of life is comprised of both financial well-being and social recognition, along with the provision of public services like education and respect for cultural rights, among other aspects (ICOMOS-IFLA, 2017). The quality of the resources demonstrates the life standards of the rural landscapes as heritage. Every site should be discussed in its context, as each one demands different standards due to the inhabitants' social, cultural, or economic structure. This criterion can be evaluated with three indicators: infrastructure, urban network, and superstructure opportunities (Table 4.10).

Table 4.10 AC.2 Resource accessibility criteria decision structure.

code	criteria	code	indicators	alternatives
AC.2	Resource accessibility	AI.6	infrastructure	Infrastructure is existent. Infrastructure is absent.
		AI.7	urban network	very good satisfactory moderate poor bad
		AI.8	superstructure	Superstructure is sufficient for the coping with the transition. Superstructure is insufficient for the coping with the transition. Superstructure is absent.

AI.6 Infrastructure: The modern life, even in the rural environment, requires some needs to provide continuity of life. The primary need for life is water, and all settlements' locations had to be chosen due to this. Due to their year of build, rural landscapes as heritage could be designed without any other infrastructures like electricity, heating systems, telecommunication, sewage systems, or waste management. Local authorities are responsible for integrating the developed services into the heritage buildings and sites

(ICOMOS, 2011b). Together with the technologies that make life more uncomplicated and comfortable, these infrastructures have become inevitable parts of life. The heating systems can be an example of various comfortable systems results of new technologies. In addition, the population increase by comparison with first built times is grounded with new methods for organizing life. Sewage systems and waste management are essential, especially in crowded settlements. For the evaluation of infrastructure indicator, telecommunication opportunities should be included because today, it can be a fantasy to survive rural life with the local inhabitants without using the internet or phone calls. Consequently, the value of CI.15 should be calculated as an average of water, electricity, heating, telecommunication, sewage, and waste management (Figure 4.6). The executor will decide whether the infrastructure is absent or existing. According to the context of the site, like climate, geography, practices, or traditions, the executor can add the required infrastructure elements to the evaluation set.

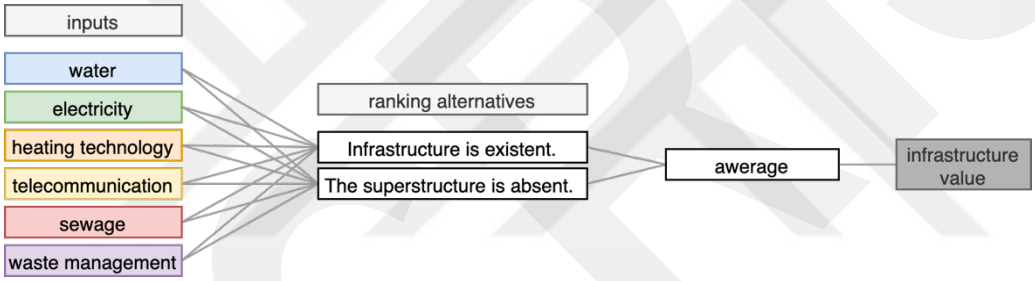


Figure 4.6 Infrastructure indicator value assessment tree

AI.7 Urban Network: Cities can offer multiple opportunities and experiences that enrich the quality of life on economic, cultural, and social meanings. The reach to these advantages effortlessly is preferable for today's generations. So, the developed accessibility from the rural landscapes has a respectable effect on making the sites alive with their local users. COE Recommendation N(90) on Services and Infrastructures in Rural Areas emphasizes the power of mobility and access to the services with these titles;

"- encouraging the coordination of existing transport services within a region, as is often the case in urban centers;

- encouraging multi-purpose utilization of specialised means of transport (school transport, postal vehicles, etc.);

- promoting the adoption of innovative solutions at local level (minibus on request, subsidised

taxis, etc.)" (COE, 1990) (Table 3.3). This indicator covers the road designs that enable private car usage and public transportation activities. Nevertheless, the main roads can be an advantage only if designed not to harm the cultural heritage sites' tangible and intangible values. The regulations of the transportation system design in cultural heritage sites are defined with Washington Charter article v (ICOMOS, 1987) (Table 3.3). It states that the main transportation actions should finish at the periphery of the site, and it should be protected with small interventions to the site center (ICOMOS, 1987). The rural areas have been built generally based on pedestrians, animals, or smaller vehicles, so at the city center, pedestrian movements should be the priority and designed in the conservation plans. The executor should research all accessibility alternatives to the public or private services outside the sites and the circulation quality even inside the area. According to analyses of whether the current situation can respond to the population's needs for transportation or not, the executor can assess this indicator.

AI.8 Superstructure: The term superstructure symbolizes the social, cultural, and economic opportunities of the rural landscapes. These opportunities are listed as primary schools, health centers, employment, socio-cultural activities, and shopping opportunities. Even if the site has well-organized urban networks and transportation systems for reaching external services, some services should be within the site boundaries. Education is one of the major needs, especially at the primary level; students should get an education near home. Similarly, primary healthcare services should be easily accessible. Job opportunities created from the rural site can support and sustain the vernacular production. The economy is one of the influential factors for keeping a rural site alive. Without economic sustainability, mentioning a holistic conservation action for the rural landscapes as heritage is hard. Near the production practices, the heritage site itself can be an economical source and create job opportunities (Faro, 2005). Each site has different inhabitant characteristics and needs for socio-cultural activities and shopping opportunities. The executor should understand the requirements of the sites due to the demands of the local people and choose the appropriate alternative, whether the superstructure is absent, insufficient, or sufficient. Similarly, to the infrastructure evaluation, this indicator value is calculated by the average of the sub-services (Figure 4.7).

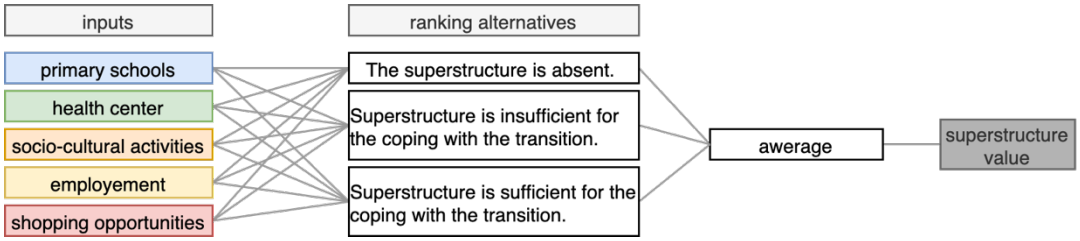


Figure 4.7 Superstructure indicator value assessment tree

4.3 Vulnerability Assessment Application

MAUT offers several alternatives for each methodology stage, allowing different combinations and various assessment models to be created. The application of the method covers both fieldwork and desk-based studies. As per the sections above, after selecting the site and executor, the process should start with understanding the system of the method, formulations, and opportunities it offers and then creating a decision tree with clear, understandable, and evaluable indicators. RUHET suggests two main criteria: lack of coping capacity and susceptibility as critical vulnerability factors. As an entire assessment, it investigates the weaknesses and robust features of the selected case for establishing the resilience approaches. Thus, this study identifies the vulnerability value for each property of the rural landscapes as heritage, sort, and develop resilience approaches significantly. The vulnerability decision tree of the model is worked up with the capability of applying both built and natural environment elements.

The second stage is about the quantification of the study. Weight and utility value decisions should be finalized to create computable data for each heritage item in a rural area. Even the executor selected for the model can complete all these steps individually; the RUHET highly recommends determining weights and utility values with an expert group. Cultural heritage conservation needs to use qualitative assessment methods, and group decisions can help to create more objective results. Due to the context of the selected case settlements, academicians, public employees, or private sector architects can be offered as the experts for the weight decisions. The executor(s) can determine the number of them according to the case's circumstance. The selected group members should be architects who are specialists in cultural heritage studies and familiar with the selected rural landscapes. While the model suggests discussions between the group members and achieving one final response, some remote models and surveys can be preferred due to

the number of executors and the criteria and indicator needs weight. The executor(s) is responsible for choosing a method listed in the former sections (MAUT part), combining the results, and finalizing the weights.

Since it is hard to calculate the habitus transition threat differently from the natural ones, the created indicators have discrete alternatives. Therefore, providing the more objective utility values for the alternative situations, an expert group decision is critical. İndicator decision alternatives defined by the model; however, it can be revised under any needs due to the study region. All indicators have discrete results at the offered decision tree, so using the direct assessment method will suit this stage. Likewise, in the weight assessment, the executor is responsible for planning the experts' decision period and completing utility values between 0 and 1.

The fieldwork studies center on collecting information for the indicators from the described properties of the rural sites. As explained in the RRULHET application methodology, the production, socio-cultural, commercial, housing, and transportation spaces should be listed as open and closed built environments. This cultural landscape as a heritage component should be investigated according to the questions of the indicators. Each unit of the rural landscape is unique and possesses distinct characteristics. Therefore, while the proposed decision matrix is designed to address all necessary questions generally, the evaluation options for indicators can be customized if needed. This responsibility lies with the executor.

The study suggests creating a vulnerability inventory card to record the related information. This card should include three sections of data: general features, lack of coping capacity, and susceptibility. The general part covers the inventory number, the decision maker who fills the card, locational information, registration information, history, and photos belonging to the studied spaces. Only details change due to the space effects, and the lack of coping capacity criteria can add the card, like infrastructure, legal status, and documentation inventories. A significant portion of this card is allocated for susceptibility information. This is because it contains subjective information for each structure to be examined and requires detailed observation. The primary objective of this section is to understand the changes that both the structure and space usage have undergone, in addition to information on their current usage status. In order to supplement the information on inventory cards with drawings and notes, when necessary, a section

should be allocated for this purpose. Collected data from the field should be processed digitally, and the numerical value should be interpreted according to the provided resilience.

Today, there are many applications available for use in decision-making processes. The executor (s) can benefit from these applications in converting expert group decisions into numerical data and calculating vulnerability values based on weights in the final stage. Alternatively, they can perform these calculations with a set of formulas they create. The crucial issue is to keep records organized and archived. Expert decisions should be expressed individually and in a table showing the resulting calculation values. Secondly, for each heritage component on the inventory card, all criteria and indicators should be evaluated separately, and tables showing their values should be prepared. These lists will facilitate the comparison of indicators and sub-criteria, as well as the evaluation of the lack of coping capacity and susceptibility results of building groups. After completing all the steps of vulnerability calculation, indicators that reduce the resilience of rural landscapes as heritage against habitus transition by increasing lack of coping capacity and susceptibility will be identified based on the obtained data. Recommendations for effective management will be developed at national, regional, and building scales.

4.3.1 The Application Areas of the Model

The RUHET is created to conserve living rural landscapes as heritage under transition. The selected heritage sites and their properties can be sorted with this model according to the vulnerabilities, coping capacity, or susceptibility values. In addition, the model helps to investigate the susceptibilities building element by element. The application opportunities of the model are explained below according to five user groups: international organizations, national authorities, local authorities, NGOs, and academicians and researchers.

International organizations like the UN, UNESCO, ICOMOS, ICCROM, or UNISDR can apply the model to raise awareness about the hazard in question. Together with an international expert group decision for the weights and utility values, the model can be developed and published as a guide for the world's rural landscape as heritage.

Starting from the governments, the national authorities can profit from the RUHET at the different stages of planning, risk mitigation, and cultural heritage conservation. The model can lead to governmental decisions covering rural landscapes, especially for the sorting and prioritization problems of the sites for deciding the order of mitigation actions and investigating the national vulnerability characteristics. In Türkiye, the following institutions can apply the model;

- Presidency of the Republic of Türkiye
- Republic of Türkiye Ministry of Culture and Tourism
- Republic of Türkiye Ministry of Environment, Urbanization, and Climate Change
- Republic of Türkiye Directorate General of Foundations
- Republic of Türkiye Directorate General of Cultural Heritage Conservation and Museums

Local authorities are generally the primary institutions responsible for conserving rural landscaping as heritage. The model could be advantaged locally while preparing the urban implementation, urban conservation plans, and transition period building regulations. A guide can be ready for the resilient vernacular architecture and natural sites of the cities by using the RRULHET. Also, vulnerable rural landscapes as heritage and building elements of the cities can be determined and sorted for mitigation actions. In Türkiye, the following local institutions can take advantage of the model;

- Municipalities
- Regional Councils on the Conservation of Cultural Property
- Directorates Regional of Foundations
- Directorates Regional of Cultural Heritage Conservation and Museums
- Directorates Regional of Environment, Urbanization, and Climate Change

National NGOs like ICOMOS Türkiye National Committee, UNESCO Türkiye National Committee, ÇEKÜL, Turkish Historical Foundation, The Union of Historic Towns, etc., researchers and academicians who studied cultural heritage can apply the RUHET.

4.3.2 The Application Stages of the Model

The steps to be followed during the use of the RUHET model are explained below (Figure 4.8):

A. Selecting the application site and executor: The model is created for the rural landscapes as heritage, and it is recommended to apply the heritage sites that are conserved and living. The application site can be selected by the institutions and researchers that are explained above.

One of the most critical roles in the model is applying the model. The person who manages the whole process can be called a decision-maker, moderator, practitioner, executor, etc. In this study, they are chosen to be called "executors." The executor can be a single person or a group formed from those who can take on the decision-maker role. In the case of using a group as a decision-maker, the group should consist of at least three people. The executor is expected to have fundamental knowledge and experience in cultural heritage conservation and vernacular architecture. Therefore, it is recommended that individuals who have received training in this field or have previously worked on at least one architectural preservation project be selected. If the executor is a single person, they should be an architect due to the need for architecture and building element system analyses. If it is a group, it should include an architect. As explained in the above section, the group can select them as responsible institutions. Subsequently, all executors should be informed about RUHET and the implementation steps.

The executor(s) are responsible from;

- Control and management of the whole process,
- Choosing the expert group and guiding them in the decision-making process,
- Evaluating the decisions and finalizing the decision tree with weighs and utility values,
- Application of the model and filling the heritage vulnerability cards by deciding the utility values of indicators,
- Surveying and documenting the site,
- Calculation of all data comes from the site,
- Developing resilience strategies.

B. Documenting the selected cultural heritage area, its values, and habitus: This model focuses on the vulnerabilities due to the habitus changes, so documenting the vulnerabilities is required. Unlike an ordinary heritage survey and documentation aimed at the site's cultural heritage values, it focuses on the model indicator assessment depending on the site surveys. The study starts with understanding habitus and its transition and continues with finding out their consequences for settlement and architecture scales.

Archive research, literature studies, and interviews contribute to understanding the natural and social environment. Locational and geographical features and historical, social, and demographical developments should be explained. The settlement should be examined with open and closed spaces, which are properties of the rural landscape as heritage. The second and critical stage is the document vernacular architecture, considering material usage, construction systems, plan schemes, façade organizations, and form. Also, the daily and social practices, space usage, and vernacular production habits should be investigated as intangible heritage aspects. As the documentation, several diagrams, drawings, and typology studies should be studied.

C. Analyzing transition threats to the cultural heritage value: After the documentation of the rural landscapes as required, this stage offers the analysis of the results of the transition on the selected vernacular settlement. By creating a matrix for comparing with the authentic situation of the heritage site, the severity of the hazard should be identified. Understanding the relationship between heritage change and habitus transition is required to decrease the hazard. Settlement and building changes should be examined according to the habitus's social, natural, and locational transition.

According to the needed data from the site, the executor should select the rural heritage properties to which the model is applied. The model prepared as appropriate for each tangible element of the rural landscapes as heritage. During the implementation, regardless of the vulnerability assessment stage, data collection from the field to assist in selecting indicators decisions should be realized by the executor filling out heritage vulnerability cards. Therefore, being informed of the decision tree and documentation of the chosen site is very critical. In this part, the executor works as a decision-maker. Then, the data collected from the properties should be digitalized and stored for vulnerability assessment.

D. Assessing the vulnerabilities: All former stages of the model are planned for the vulnerability assessment part. This stage is generated with MCDM methods. As discussed in Chapter 3, the MCDM has started to apply cultural heritage fields. The lights of this research and the requirements of the RUHET, MAUT, and AHP methods are selected. MAUT offers a broad spectrum, including various sub-decision-making methods for the different stages of the process. It allows sorting by calculating utility values, answers the problems of finite and discrete results of the indicators, and is appropriate for group decisions. A decision tree consists of the lack of coping capacity and susceptibility criteria. The direct assessment method is selected to decide the weights of the AHP and the utility value.

1. This stage starts with the expert selection by the executor. The expert should select from various specialties of the cultural heritage field and different lines of work. It is highly recommended that they be chosen between governmental institutions, academies, and freelancers. They can participate with varying points of view in the assessment. They have two primary duties: deciding the weights and utility values.

2. The executor should organize several meetings with the expert groups to explain the decision tree and AHP for the weight decisions.

3. After pairwise comparison questions are prepared, the experts should collect and analyze the data. According to the consistency ratio, the results can be acceptable, or an expert should be asked for the changing decisions.

4. The collected and checked data should be digitalized, and the average of the results should be accepted as the final weights of the criteria and indicators.

5. The second expert choice should contribute to deciding the utility values.

All collected data from the site should be evaluated with the calculations of the overall values, and graphs and tables should be created to interpret the vulnerability.

E. Developing resilience strategies: The model aims to provide sustainability while decreasing susceptibilities and raising the coping and adaptive capacity of the heritage. Therefore, the vulnerability assessment interpretations have critical power. The created graphs and tables represent the weak and strong criteria and indicators. Also, overall utility values show the degree of the vulnerabilities of each heritage property.

These results can not be categorized as good, fair, or bad. They can be used for the comparison of the indicators and properties. Consequently, conservation actions can be planned regarding the decreasing susceptibilities, and then the strategies can be determined for the coping and adaptive capacity.

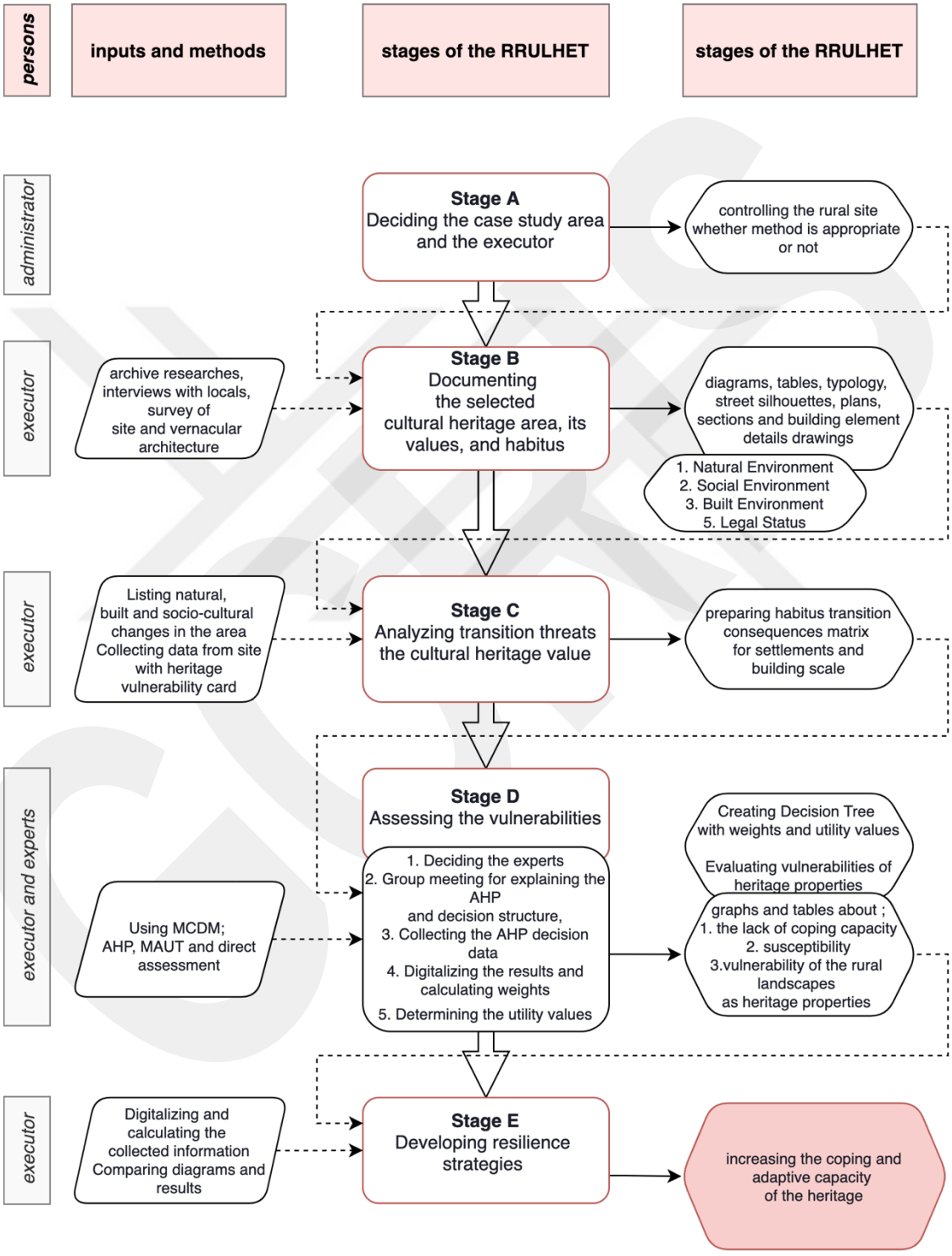


Figure 4.8 Stages of the model

4.4 Chapter Review: Sustainable Rural Heritage Against Habitus Transition

UNESCO and ICOMOS highlighted that the progression of civilizations in economic, social, and technological realms posed a significant threat to both natural and cultural heritage during the 1972 General Conference and Assembly. Acknowledging the inevitability of development and its impact on our way of life, there's a pressing need to take responsibility and regulate these changes, as outlined in international agreements. The thesis claims that these developments, together with the physical environment, can result in the transition on the habitus. The transition simultaneously creates change in users' daily and social practices, and users alter social and built environments, in other words, tangible and intangible heritages. This habitus transition can dramatically affect the rural landscapes as heritage properties because of their vernacular and traditional features. The impact of habitus transition is particularly pronounced in rural areas, where the direct impact of daily human practices significantly affects cultural heritage properties compared to urban centers.

While international studies separate threats to cultural heritage as natural and human-induced, the study aims to contribute to the literature by indicating transition as a threat to cultural heritage. Also, this threat links dynamically and directly to the rural landscapes, so resilience approaches are investigated. Given the specific focus of this study, the RUHET model is created to develop conservation strategies for rural landscapes as heritage in transition. These strategies are crucial for conserving living cultural heritage, ensuring these areas' continued preservation and vitality.

Most rural heritage have experienced similar challenges to the change and landscapes undergo ongoing, irreversible, and unavoidable transformation processes. Since, rural heritage policies should concentrate on the management of acceptable changes over time while addressing the conservation, reverence, and improvement of heritage values. However, there can be various reasons for this, so hazard assessment is not one of the goals of the thesis. Understanding and listing transition reasons that are adequate for developing strategies with this model. In that, as explained in the chapter, vulnerability often necessitates enhanced sustainability strategies developed with resilience to mitigate the impact of potential hazards, and vulnerability assessment is a

vital part of the provided sustainability model. Using the MCDM methods, an objective and systematic assessment is tried to be created for the examination of the susceptibility, coping, and adaptive capacity. These evaluations can lead to management strategies for providing sustainable rural heritage against transition. The primary risk facing rural heritage lies in the need for effective control and management amid diverse user interpretations, leading to the necessity for a new approach to living. Significantly, the sustainable conservation of living cultural heritage does not hinge on preventing change but on effectively managing it while preserving the core values of cultural heritage. This necessitates implementing rural sustainability strategies, emphasizing ensuring these areas' continued preservation and vitality.

Chapter 5

RUHET: Application of Bağpınar, Kayseri

This Chapter investigates the applicability of the RUHET and demonstrates an example of how it can be specialized for each different context. The first section represents the selection of the executor and the case area, and the second section specifies the model for the case rural landscape as heritage: Bağpınar Settlement, Kayseri. As the model offered, the chapter carries on with the understanding studies of the site with the exploring social, natural, and built environment features for the examining the habitus. Only if the characteristics of the settlement and local people are recognized can the change in the habitus and transformation of the cultural heritage be explored. The vulnerability assessment section starts after exploring the hazard and identifying the cultural heritage features of the Bağpınar rural landscape. The RUHET provides some alternative methods, and the Bağpınar case represents a customizing example of the vulnerability assessment. The final section discusses resilience strategies to manage habitus transition, raise capacity, and reduce susceptibility.

The thesis includes creating a resilience model for the conservation of rural heritage areas, checking the model on a rural heritage site, and finalizing the model by revising it again. Bağpınar historic rural settlement in the Melikgazi district of Kayseri is chosen as the case study area. Bağpınar is the northernmost of the seven settlements in the Koramaz Valley, which was included in the UNESCO World Heritage Tentative List in 2020 because of the cultural landscape values, including historical and natural heritage sites dating back to ancient times. The settlement is under the pressure of habitus change due to demographic developments in history and being on the border of the growing city. The testing phase of the model on the chosen rural heritage area will start with identifying the risks as a result of that pressure. Analysis and documentation studies will determine which transformation needs to create risks and how these risks affect and threaten cultural heritage values. Documentation studies will be used only as supporting materials for

determining vulnerabilities of areas and resilience strategies for them. Evaluation of these surveys will help to organize the methodology of conservation adaptation and resilience of the site. After the testing model on Bağpınar settlement, the assessment will help the finalized model.

5.1 Selection of the Case Area

The RUHET model has been developed as a general resilience model applicable to all types of rural landscapes as heritage in transition found anywhere in the world. The sampling area was determined based on specific criteria rather than being randomly selected for the application because they represent more different circumstances. The first criterion was the number of registered cultural heritage assets to allow the model to be applied to a wide variety of building types and achieve maximum data access. These cultural heritage properties should reserve varying levels of registrations. The second criterion is that the proposed case site's habitus should be changed or changed. It is aimed that the area should have various conservation problems for different heritage properties. It is critical to show that different susceptibilities explain the way of assessment and present conservation strategies.

Today, Anatolia hides numerous vernacular rural landscapes with rich historical backgrounds. These rural environments created based on past centuries' needs and requirements are in a transition process, leading to a loss of cultural and natural assets as a consequence of this process. The model works only with exposed cultural heritage to the threat, so the case site should reserve the heritage stocks that still hold the heritage value despite the deterioration and interventions. For these criteria, Bağpınar Rural Settlement is selected for the case study. The site is in the Kayseri city boundaries and on the Koramaz Valley, which is listed on the UNESCO World Heritage tentative list due to its outstanding values about human and nature interaction. Bağpınar hosts traditional rural structure examples, which are the products of the practices that emerged due to the human and nature relation. Besides the landscape, it has various open and closed cultural heritage assets with production, socio-cultural, commercial, transportation, and dwelling. The site and its properties individually have different registration statuses. With all these circumstances, Bağpınar passed several dramatic transitions in its habitus due to its historical background dating back to ancient times. Today, the habitus continues to be

threatened by changes due to demographic, socio-cultural, economic, and structural (governmental) developments. Consequently, Bağpınar rural landscape as heritage is selected according to its cultural heritage value and variety and threats by the change as a case study.

The second critical selection stage for the applying model is selecting the executor, the responsible person, or a group of persons from the praxis. The executor should organize the whole process in a detailed way, be responsible for the site survey, select the experts, and collaborate with the stakeholders in developing strategies. Therefore, the executor should be, or the executor group should include, an architect expert on cultural heritage studies. For the sample study of Bağpınar rural landscape, the writer of the thesis, an architect with a master of science degree in the restoration of cultural heritage, is the executor.

Table 5.1 Expert list

	sector	**institution**	**occupation and education**
Expert 1*	university	Kayseri Abdullah Gul University	architect, associate professor,
Expert 2	university	Kayseri Erciyes University	architect, assistance professor,
Expert 3	university	Kayseri Nuh Naci Yazgan University	architect, assistance professor,
Expert 4	public institutions	KRCCCP	architect, professor
Expert 5	public institutions	KRCCCP	architect
Expert 6*	public institutions	Kayseri Metropolitan Municipality	architect, MSc
Expert 7*	private sector	freelancer	architect, MSc
Expert 8	private sector	an office	architect, PhD
Expert 9	private sector	freelancer	architect, PhD
*: selected experts for the utility value decision making too.			

The RUHET model offers some specifications to the users at the decision-maker selection process, vulnerability assessment weight, and utility value evaluations. For the Bağpınar case, the writer of the thesis decided as the executor individually. The selected vulnerability assessment method, MAUT, presents several weight assessment methods. The executor's individual decisions can create subjective results, so the expert group is

generated for more objectivity. For the control group, 9 architects familiar with the Bağpınar settlement and the cultural heritage conservation studies were included in the model application. These are selected from the three sectors: universities, public institutions, and the private sector. The whole group had to do the weight assessment, and three chosen from each sector were assigned for the utility value decision (Table 5.1).

5.2 Exploring the Habitus

As discussed in Chapter 2, habitus is intertwined with factors like natural and social. The rural landscape is closely linked with local communities' social and everyday customs and their surroundings. However, it faces challenges safeguarding its rich cultural and natural heritage, particularly against changes or disappearances. This underscores the essential requirement to take protective measures to conserve this priceless cultural and natural inheritance. To understand the current habitus of the Bağpınar and its transition regarding location, geographical features, historical, demographical, and social developments are examined.

5.2.1 Natural Environment

In the scope of this thesis, the selected settlements Bağpınar are situated northeast of the city center, on the Koramaz Valley, within the Melikgazi District of Kayseri Province, Turkey. Three valleys represent the cultural landscape characteristic in the northeast of the Kayseri city center. Each valley settlement has similar characteristics and has its residential areas, production landscapes, socio-cultural structures, commercial units, and recreational spaces. In the Derevenk Valley, there are Germir and Tavlusun; in the Gesi Valley, Mancusun, Nize, Darsiyak, Gesi, Efkere; and in the Koramaz Valley, there are Ağırnas, Vekse, Ispıdın, Üskübü, Turan, Büyükbürüngüz, Küçükbürüngüz settlements (Figure 5.1, Figure 5.2). These semi-urban settlements have experienced depopulation due to various reasons such as natural, socio-cultural, economic, political, etc., and continue to face ongoing losses. Despite these losses, each settlement sheds light on the past through its cultural landscape values (Kevseroğlu, 2023). Therefore, revealing all habitus, cultural heritage values, and vulnerabilities of the Bağpınar can only be possible with a holistic investigation within the valley’s context.

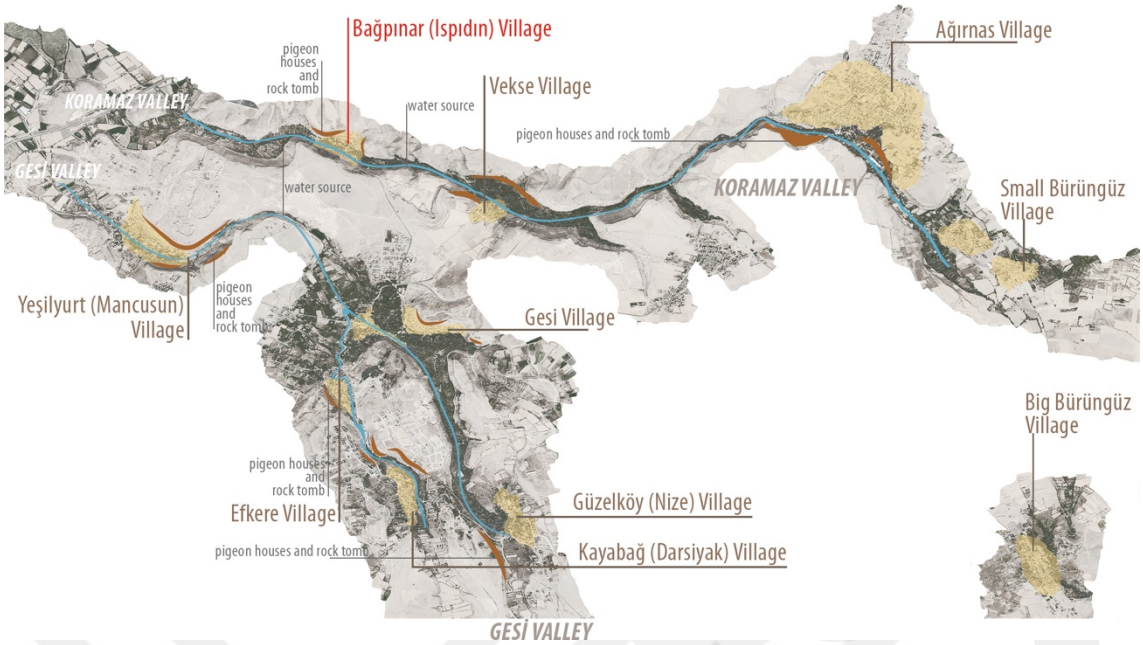


Figure 5.1 Koramaz and Gesi Valleys and villages

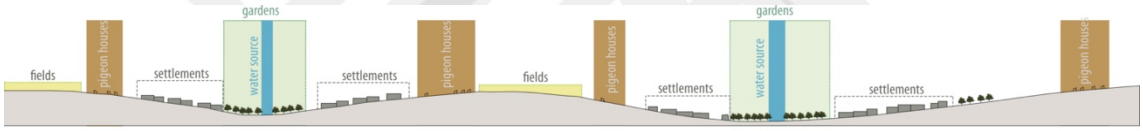


Figure 5.2 A schematic section cuts Gesi and Koramaz Valleys

5.2.1.1 Location, Geographical Features

Koramaz Valley, situated 20 kilometers from the city center, stands north of the Gesi and Derevenk Valleys (Figure 5.3). Bağpınar is the eastmost village of the Koramaz Valley near the Vekse Village. Due to changing political structures and settlement definitions, there isn't definitive information regarding its previous boundaries. However, with Turkish Act No. 6360 on Metropolitan Areas, it has become a neighborhood within the Melikgazi district, encompassing an approximate area of 6000 km2, including the eastern part of the Gömeç plateau. The Bağpınar Village is located on the two reciprocal slopy sides named "*Güney Geçe"* (Southern Side) and "Kuzey Geçe" (Northern Side) of the Valley between the Koramaz Stream and plateau. The Koramaz Stream, which divides the village in half as it flows through the middle, is approximately 1130 meters, while the plateau above the settlement areas stands at an altitude of 1200 meters.

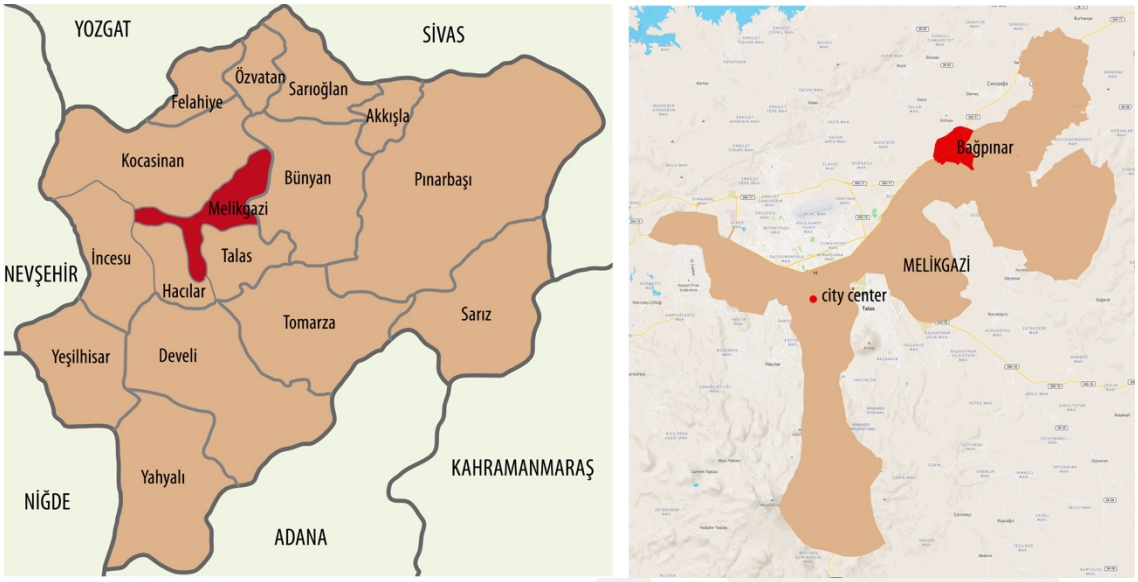


Figure 5.3 The location of the Melikgazi District in Kayseri Province (Left) and Bağpınar Neighborhood in the Melikgazi District

In Kayseri, a steppe climate prevails. Summers are hot and dry, while winters are cold with snowfall. The temperature difference between day and night remains high throughout all seasons. The wind and precipitation rates vary depending on the elevation of the province. Consequently, areas in valleys or depressions experience a milder climate, whereas regions in highlands or exposed to winds tend to have harsher weather conditions. While Kayseri has a continental climate, owing to its depth, reaching up to 80 meters in some places, and the Koramaz Stream flowing throughout the year, the village maintains a relatively more humid atmosphere than its surroundings. Thanks to this somewhat higher humidity and depth, the valley's interior exhibits different climatic characteristics from its surroundings, resulting in a diverse and rich vegetation structure in terms of plant variety.

The plateau, characterized by flat areas, rocky-sandy slopes, wet and sheltered valley settlements, and its varying elevations, has contributed to the diversity and richness of the vegetation (Kevseroğlu, 2023) (Figure 5.4). Mainly the gardening activities are sustained on the bottom of the valley near the stream with especially walnut, *gilaburu* (viburnum opulus), *cehri* (buckthorn), vineyards, and other kitchen gardening products, whereas at the plateau with barley and wheat fields.

Figure 5.4 A view to Koramaz Valley from the Bağpınar Village ((Kayseri Metropolitan Municipality, 2020)

The predominant architectural style in the Valley and its surroundings is characterized by structures carved from rocks or constructed using stones cut from rock formations. This aspect ties closely to the geological landscape of the area, particularly Mount Erciyes. Positioned to the south of Kayseri, Mount Erciyes stands at 3916 meters with a central cone, encompassing an additional 68 cones of varying sizes, ranging from 600 to 3000 meters in diameter (Kayseri Yapıları Yeraltı Envanteri, 2018). Over time, pyroclastic material and ignimbrites emitted from the volcano dispersed across an approximately 100-kilometer radius from the epicenter. This dispersion contributed to the formation of a volcanic pyroclastic layer that could reach hundreds of meters in thickness in certain areas, spanning from Nevşehir-Ürgüp-İncesu in the west to Kozaklı-Boğazlıyan in the north and Bünyan in the east, extending to Tomarza-Develi in the south (İnceköse, 2019). Carving into these various volcanic layers resulted in numerous underground settlements, caves, churches, chapels, and storage areas from ancient times. In addition, these geological structures permit the creation of tufa-based stones in these close environments and result in the stone masonry structures in the region.

5.2.1.2 Historical Developments and Social-Cultural Features

As Bourdieu claims, individuals' dispositions are linked to their historical backgrounds, creating the habitus. Hence, it is very critical to examine the historical processes of the Bağpınar together with the demographical and socio-cultural structure. The plateau bordering the southeast of the Cappadocian Plain in Kayseri features valleys containing streams at their base, and many historical rural landscapes are located around the village. Due to this particular context, its history and demographical structure are investigated widely. In addition, it is 10 km southern of the Kültepe Archeological Site, which is essential for the past of Anatolia, so the history of the Bağpınar is investigated by associating it with the Kültepe.

The region has been known for its multi-ethnical and religious structure for many years (Figure 5.5, Figure 5.6). It is thought that Bağpınar, whose former name, Ispıdın, was changed in 1961 due to the political rules, dates back to the Hittite due to the arkeological findings and locations (Cömert, 2008). Eravşar reports that the Hittite historian John GARSTANG mentioned during his visit to the region in 1910 that the history of the cave dwellings in the area dates back to the Hittites (Eravşar, 2000). The earlier times of the Bağpınar are only predictions due to the close environment and Cappadocia.

In the 17th century AD, the settlement came under the control of the Roman Empire, and in the year 395, it entered the protection of the Byzantine Empire (URL-1). Thus, during this period, the population mainly consisted of Greeks and Christians. In the 3rd and 4th centuries, although few Armenians were known in the region, they were settled around Tarsus by the Byzantine Empire (Istanbul Armenian Patriarchate, 1986). The Byzantine conquests in the 11th century led to the relocation of Armenians to regions like Sivas, Kayseri, and areas along the Euphrates, altering the ethnic composition of Central Anatolia. (Kevorkian & Paboudjian, 1992; Turan, 1971). Despite the predominant Greek origins of the initial inhabitants before and during the Byzantine era, Arab and Turkish incursions during the Middle Ages also resulted in the settlement of Christian Turks in the region (Özkan, 2000).

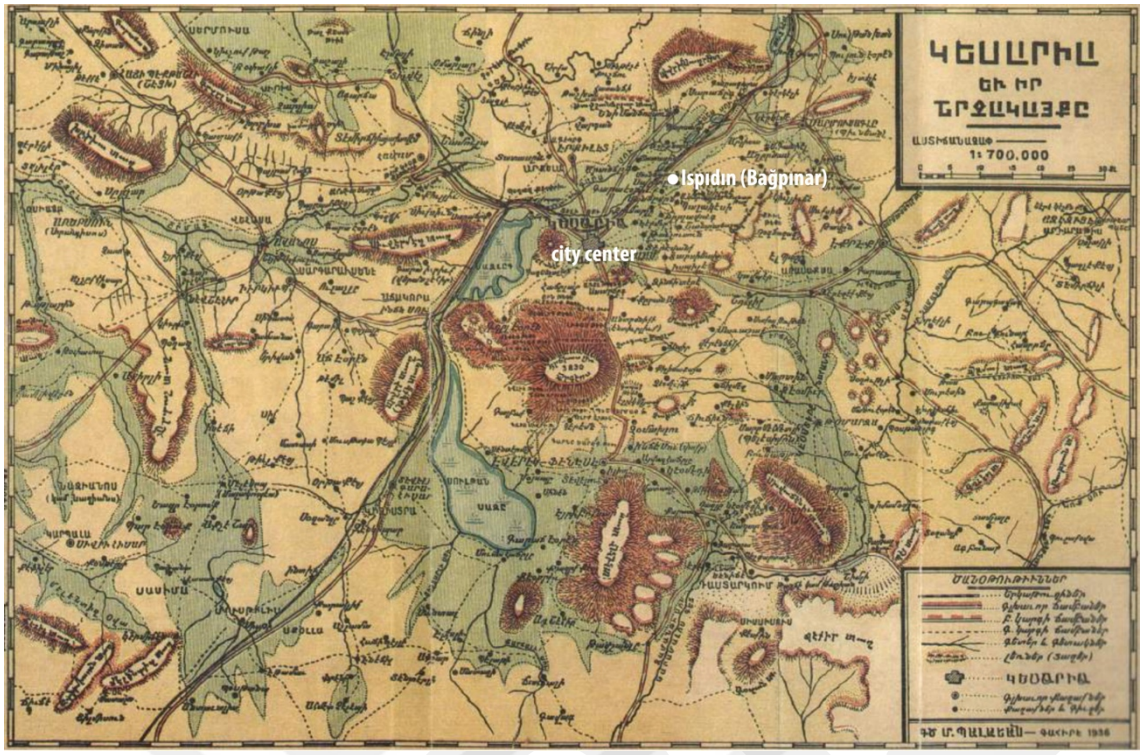


Figure 5.5 "Kesaria and Its Environs" map prepared by M. Balaian (Alboyacıyan, 1937)

During the Byzantine era, due to its location 5 kilometers from the Sivas-Kayseri road, the village of Bağpınar was strategically significant in preventing potential threats and attacks from the east towards Kayseri. The Byzantines constructed Military garrisons, utilizing its strategic importance as a center. This military significance persisted during the Ottoman Empire and was allocated to feudal cavalrymen called "sipahis"(Cömert, 2008).

After the Battle of Manzikert in 1071, with the Turkish Conquest of Anatolia, Muslim and Turkoman communities established themselves in the region. This led to a diverse demographic, social, and cultural structure in the settlements located in the valleys. Cömert claims that in 1500, 80% of the village was non-Muslim (Cömert, 2008). According to the Prime Minister Ottoman Archives documents, 29 Muslims and 33 non-Muslims lived together in 1570 (Yıldırım Özbek & Arslan, 2008). There was no other information about the ethnic structure of these Muslims. When the Armenian and Greek sources were investigated, even the close villages and valleys were mentioned according to ethnicity; there is no information about Bağpınar.

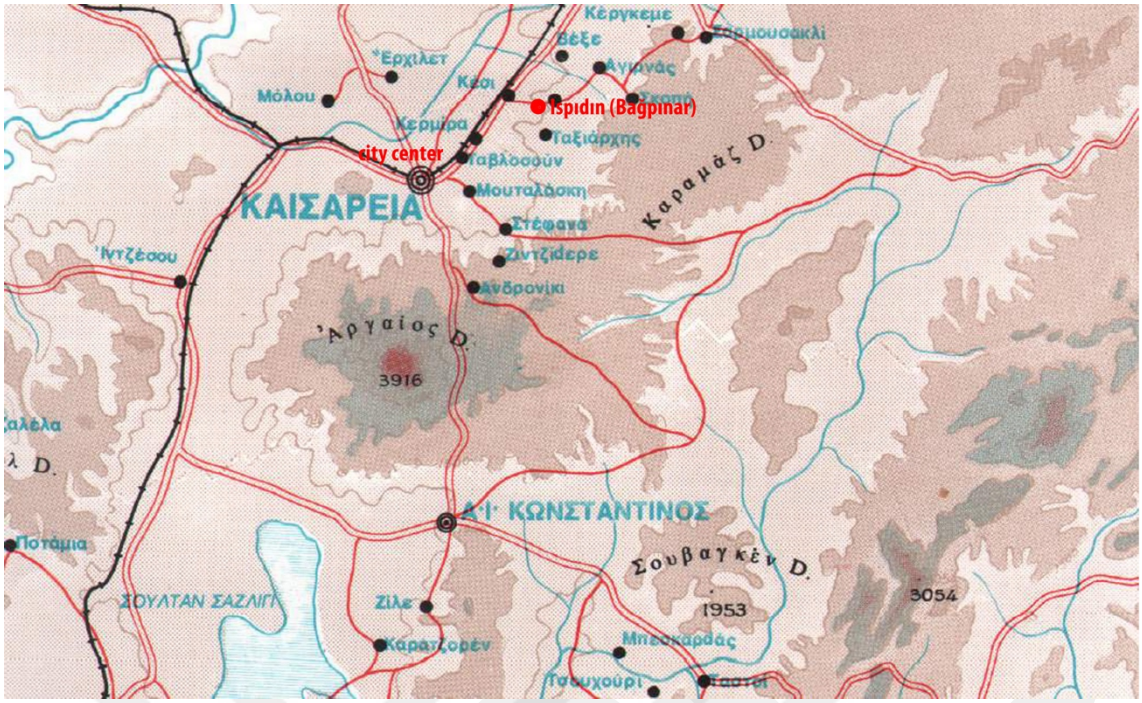


Figure 5.6 Areas with Greek inhabitants before the exchange of populations in Kayseri (Mourelos, 2004)

Additionally, according to the population records, 1831 there were no non-Muslims; only 94 Muslims were recorded (Keskin, 2000). While they continued to live in valleys and the city center, the whereabouts of the non-Muslim population in Bağpınar mentioned in the 16th-century records remain unknown. Furthermore, discussions indicate that there is no knowledge in the current memory of the people about the existence of non-Muslims living in the village. However, records and the discovered structures, such as the rock-carved church and columbarium-like buildings, indicate they lived here at some point. The population figures recorded in the 1875, 1965, and 2000 census show 510, 397, and 301 residents, respectively (Cömert, 2008).

Although minority rights were reinforced through Tanzimat and Islahat decrees, the Ottoman Empire continued to experience land and population losses with the Tehcir Law, relocating Armenians to the Middle East. The aftermath of the Turkish War of Independence in 1924, marked by the Population Exchange (Mübadele), led to the enforced departure of the Greeks. This population shift resulted in the abandonment of close settlements of Bağpınar. The rise of industrial zones in Kayseri and other urban areas amplified rural migration, contributing to the abandonment of historically significant villages. The Commission on Exchanging Foreign Place Names, established by the Turkish Ministry of Interior Affairs in 1940, changed the name of Isbıdın to

Bağpınar in 1960 (Cömert, 2008). Today, due to the changed settlement boundaries, the population of the Bağpınar can represent deceptive result, and it recorded as 242 in 2022 according to the TÜİK (Turkish Statical Institute) data. The site surveys show that today, only a few locals live in the winter at the Bağpınar; due to the closeness to the city center, it is preferred as a summer vineyard settlement. This historical evolution creates a fruitful cultural background for the locals and, accordingly, habits. However, dramatic changes can trigger the cultural heritage of the village.

5.2.2 Built Environment

The thesis concentrates on tangible heritage properties to explain the intangible heritage and habitus of the rural landscapes as heritage. A rural site covers several open and closed spaces with built and natural landscapes. Rural landscapes are living and evolving systems comprising areas crafted and maintained using traditional methodologies, accumulated wisdom, cultural customs, and regions where traditional production methods have been altered. ICOMOS-IFLA declares assets of the rural landscape as heritage; *"Rural landscape as heritage encompasses physical attributes – the productive land itself, morphology, water, infrastructure, vegetation, settlements, rural buildings and centers, vernacular architecture, transport, and trade networks, etc. – as well as wider physical, cultural, and environmental linkages and settings. Rural landscape as heritage also includes associated cultural knowledge, traditions, practices, expressions of local human communities' identity and belonging, and the cultural values and meanings attributed to those landscapes by past and contemporary people and communities. Rural landscapes as heritage encompass technical, scientific, and practical knowledge related to human-nature relationships."* (ICOMOS-IFLA, 2017). Hence, this study investigates the vulnerability of rural landscapes as heritage over physical attributes by discussing intangible heritages.

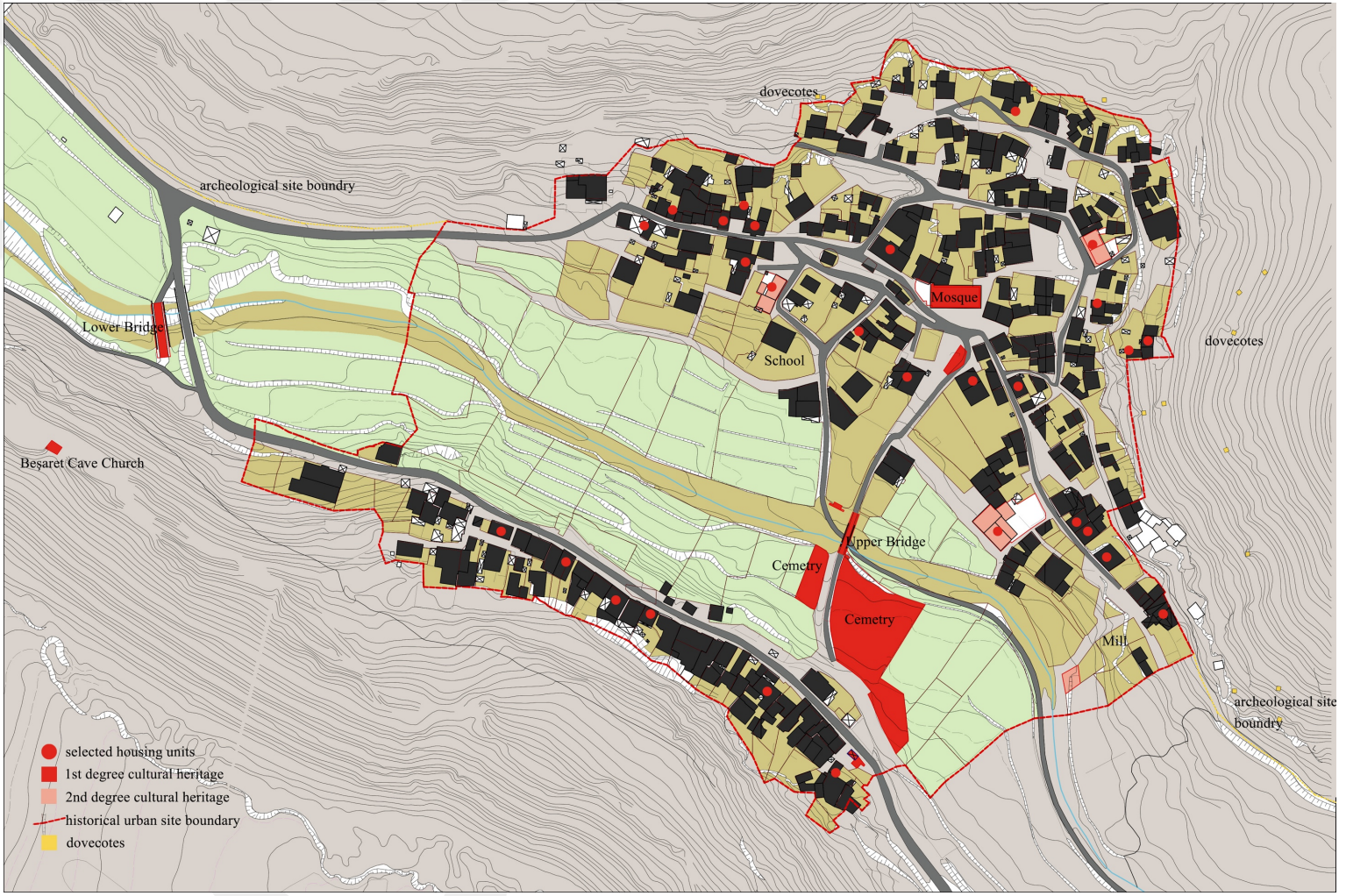


Figure 5.7 Site plan of the Bağpına

5.2.2.1 Morphological Features

The built environment created by the influence of the natural and socio-cultural features of the region can be understood by relating the morphology (Figure 5.8). In light of the social practices of the locals and due to the strengths and weaknesses of the climate, topography, geography, and location, a vernacular settlement is built. Similarly, the given cultural wealth and natural and social structure shaped the Bağpınar Village, and due to the transition of the given factors, it has changed today.

Figure 5.8 Northern Geçe (left), Southern Geçe (right)

The settlement has a hillside settlement characteristic based on the valley form. In this settlement feature, slopes have been chosen for housing settlements, considering the southwest aspect. To understand the morphology of the Bağpınar, it is essential to start with the vertical organization of the village. Due to the town's selected location having steep slopes, settlement is located between them. Two slopes separate the village, the Koramaz Stream. The bottom part of the slope is reserved for the gardens, and steeper and closer-to-water areas have been terraced as *kama* gardens allocated for agricultural activities. At the upper part of the kama gardens, the built environment of the village starts with dwellings and social open and closed spaces. The rocky areas on the hillside settlements' ridges are used as buckthorn fields together with the dovecotes. Dovecotes are a local architectural element that was used as pigeon lofts. As ascending to the plateau, agricultural production continues, and this area predominantly consists of wheat fields. Consequently, the bottom part of the settlement represents greenery organization rather than the plateau.

The architectural elements are settled according to the slope (Figure 5.9). The traditional part of the settlement consists of two main streets parallel to slopes, which provide two entrances to the village from west and east. The street on the south side *(güney geçe)* connects the village with Sivas-Kayseri Road and Vekse Village, while the north *(kuzey geçe)* street finishes with a dead end to the yard. These primary and secondary streets, parallel to the slope, connect with perpendicular secondary roads, which can be as steep as a ramp or stairs. The secondary streets start and end at the village, sometimes with another street or cul-de-sacs with the rocky yards. Two sides of the village are connected by the two historical bridges.

Figure 5.9 Hillside rocks (left) and bottom gardens (right) of the Bağpınar

Figure 5.10 Northern *Geçe* view from the Southern *Geçe*

In front of the mosque lies a single public square, while streets lead to smaller squares in front of various elements like fountains, ovens, mills, and setens (open workshops for cereal grinding). Along the main street's southern side, impressive facades of houses are seen, while the opposite side overlooks the valley base, gardens, and the northern part of the street. The north side tends to be more crowded than the southern counterpart. Streets may align with the houses or run close to the flat roofs based on the relationship between the houses and the slope (Elagöz Timur & Asiliskender, 2021). The building plots created are narrow and perpendicular to the hill and streets. The streets have adjacent building facades without any garden or garden walls.

Figure 5.11 Two sides of the village

This study assumed that all human-made areas, natural ones included as built environments. The built environment of the Bağpınar is studied as open-air and closed spaces (Figure 5.12).

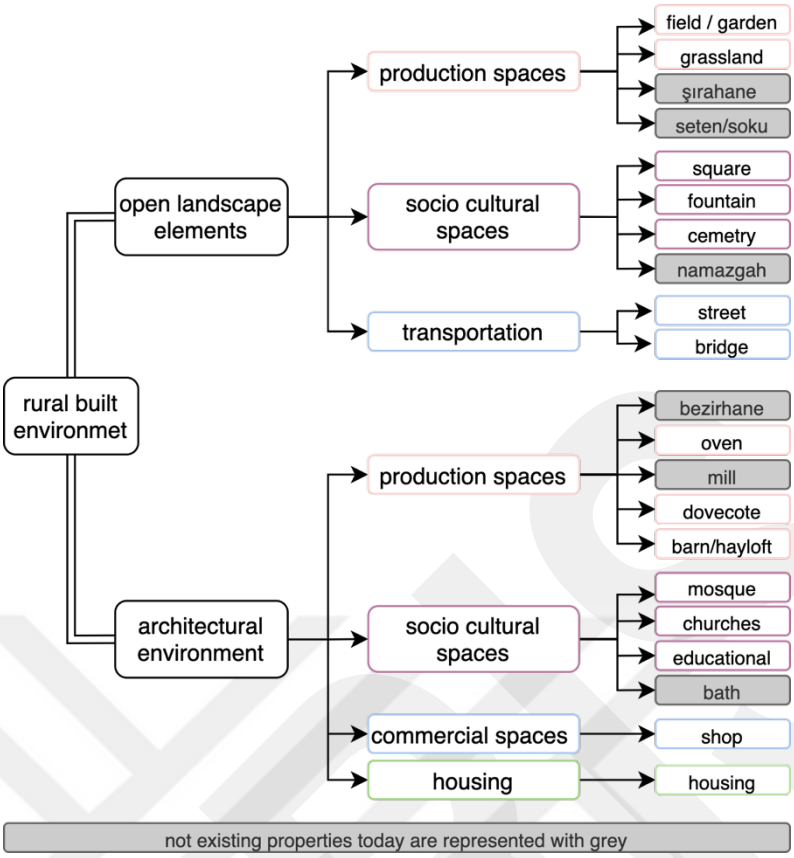


Figure 5.12 Tangible cultural heritage properties of the Bağpınar

5.2.2.2 Open Landscape Elements

Open spaces are significant areas that shape the landscape character since rural people spend most of their time individually or in groups. Open-air spaces where production landscapes intersect in villages are socialization spaces. These socialization spaces also serve as places where the images constituting the social practices of communities, resulting from shared experiences, are formed. The concept of open-air landscape elements is the collective term for places, structures, areas, or points where daily life, apart from building, occurs and involves direct or indirect production. They are examined in three titles according to today's existence and 19. century property recordings *"defter-i esas-i emlak"*; production, socio-cultural spaces, and transportation elements.

Production spaces:

Production landscapes covering the most extensive areas in rural settlements are typically fields and gardens (Figure 5.13). Gardens typically involve productions catering more to household living than commercial purposes. The garden products are partly dried or pickled to meet the food needs. These foods are stored in cool, sun-free places like

caves or cellars within houses. Gardens are commonly seen either at the valley base or around the house, considered as the courtyard or backyard, depending on the parcel of the house. In the gardens of the homes, there are trees such as apples, apricots, pears, peaches, cherries, mulberries, walnuts, etc.. At the same time, the gardens also have vegetables such as tomatoes, peppers, cucumbers, zucchini, beans, eggplants, etc. (Kevseroğlu, 2023).

For the slope's benefit, terraces were created near the stream for use as gardens. Walnuts, *gilaburu* (viburnum opulus), and vineyards are more popular products of these *kama* gardens (Figure 5.14). Grape cultivation is the primary production that shapes the region's housing and social production spaces. The grape vineyards in the area are an essential intangible heritage component that forms the "Gesi Vineyards" folk song. Grapes prefer light and permeable soils, particularly gravelly ones, and thrive in light slopes with good exposure to the sun in a north-south direction. Various post-production processes derived from grapes have significantly impacted the rural setting. These processes include making molasses, grape must, and wine after separating the eating grapes and drying them for long-term preservation (Figure 5.15).

Figure 5.13 Gardens and water source of the Bağpınar at the valley bottom

The second important flora of the Bağpınar and the Valley is buckthorn *(cehri),* which caused the creation of vernacular production spaces, too. The region of Kayseri provides suitable ecological conditions for the growth of the buckthorn's madder plant agriculturally due to its dominance by the steppe climate, its ability to grow on rocky slopes, and its preference for sandy soils in volcanic areas. The fruits of this deciduous plant in winter are 6-7 mm in diameter, dark green, smooth, and on the inside, they consist of bright yellow shiny grains (Kevseroğlu, 2023). In the 19th century, the cultivation and trade of the dyer's madder plant were a significant source of income for the people of

Kayseri, making it an essential aspect of the local economy (Somuncu, 2004). It's said that two-thirds of the total yield of the product in the country is provided by the Kayseri region (Issawi, 1980). When the products exported from Izmir to other neighboring ports in 1834 were examined, the Dyer's Madder plant ranked 11th (Somuncu, 2004). It's observed that the dyer's madder plant supported local dyeing, weaving, and carpet-making industries in Anatolia (Baykara, 1967). Although the dyer's madder plant is recognized in collective memory, it's rarely found on slopes today due to the completion of its economic life.

Figure 5.14 *Gilaburu* plant in different seasons

The mentioned vegetative productions cause semi-open post-production spaces like *şırahane (şirane)*, *seten*, and *soku. Şırahane* are structures typically found in open spaces, consisting of a stone basin used to crush grapes. While the grape crushing process can be collectively done in large wineries located in various squares within the village, it can also be individually carried out in small-scale basins found in the courtyards or enclosed spaces of homes. This activity, which continues today, generally takes place in setups within households. Next to these basins used for crushing grapes in the open, there are arrangements for boiling the crushed grapes in large pots. According to Kevseroğlu's account, the space utilization during the production of molasses is as follows:

"To briefly describe the process of making molasses, clay soil (used in molasses production and obtained from the region, also known as molasses soil) is mixed with the crushed grapes in the winery while stomping. This mixture, called 'şıra,' is then transferred to the cauldrons. When 'şıra,' stirred and boiled on the fire, reaches the desired maturity, it is left to cool. After cooling down, the clay soil and 'şıra' separate from each other, with the soil settling at the bottom. The filtered 'şıra' is collected, and the settled soil is discarded. When the collected 'şıra' is boiled, it turns into molasses.

Next to the winery, there is a separate piece of equipment called 'fişkem,' which collects the dripping juice after the grapes are crushed. This dripping is called 'damlama,' which is clear and used in vinegar making." (Kevseroğlu, 2023).

Figure 5.15 Grapes inside the settlement (left and middle) and a public *şırahane* (right)

Seten and soku can be described as small-scale mills (Figure 5.16). Seten stone refers to the vertically placed millstone turned by animal power used to separate the bran of grains and its container. *Seten* stone is also known for pounding *bulgur* and *yarma*. Every village settlement in the valley has at least one place called *"seten,"* a vertical millstone located within the neighborhoods or their outskirts. Although records from the 19th century mention one *seten* in the village, it cannot be found in the village today. These areas, allocated for common use by the entire village, can be described as meeting points and small squares for the villagers. *Sokus*, on the other hand, are rural facilities that enable the manual grinding of wheat. Carved from smaller single-piece stones, *bulgur*s are pounded through communal efforts using a pestle. While they are no longer used for their intended purpose, *sokus* can still be found today.

Figure 5.16 *Seten* at Bağpınar (left) (Çorapçıoğlu et al., 2008), *seten* stone at the street (middle), *soku* stone with new use (right)

Socio-cultural Spaces:

Fountains are symbolic public spaces that provide shared water sources in rural areas. In villages, fountains are typically constructed strategically, offering easy access. They serve a multifunctional and sustainable system by delivering water and channeling

the flowing water to troughs and water channels. The water sourced from the spring is used for drinking, gradually transferred through structural solutions to troughs where animals drink after continuous flowing fountains, and then further directed to water channels for irrigation of vineyards and gardens. In Bağpınar, four open fountains of various sizes are constructed by stone masonry systems (Figure 5.17). Among them, the fountains in the southern *geçe*, in the valley base, and near the mosque have been registered as cultural assets by the KKVKBK. Although these areas have lost their utility by providing water infrastructure to homes over time, they have not lost their socio-cultural value reminiscent of a bygone technology.

Figure 5.17 Fountains of the village; mosque (a), southern *geçe* (b), and upper (c,d) fountaions

Squares are extensive gathering areas in rural areas that witness events such as weddings, festivals, celebrations, holidays, or political occurrences. In Anatolian rural settlements, there is generally typically one village square, the size of which varies. This square is often shaped in front of the mosque in Muslim communities. Due to the utterly sloped terrain, Bağpınar doesn't generate around a large square. Although it's challenging

to pinpoint an exact square, the small open area in front of the mosque can serve as the village square. However, no other public functions besides the mosque are directly associated with the square (Figure 5.18).

Figure 5.18 Main mosque square (left), fountain square (middle) and a secondary square between houses (right)

Additionally, secondary squares are shaped around public spaces like street intersections, fountains, bridges, or ovens. They were used as gathering spaces and inseparable parts of social life. The tertiary squares are semi-public ones used by the inhabitants around them. Villagers without personal outdoor spaces in their homes primarily utilize these areas for social engagements and work-related tasks. Traditional customs tied to weddings, circumcision, funerals, etc. ceremonies often take place within these semi-public spaces. Dance floors, dinners, or sitting spaces are organized according to the ceremonies in these semi-public squares. The semi-public open spaces lacking clear boundaries have a functional rather than physical definition, shaped mainly by various activities and social engagements. For instance, groups of inhabitants typically take turns or work together in these spaces, often for activities like preparing winter eating preparation.

Figure 5.19 Cemetery of the Bağpınar

Traditional Anatolian rural settlements have a cemetery that has changed to the religious. Bağpınar has one Muslim cemetery in the middle of the two sides, at the bottom level of the valley, and it is separated into two parts by the historic stone bridge. The KKVKBK also registers the cemetery as a cultural heritage (Figure 5.19).

Transportation:

The transportation elements like roads and bridges are also one of the cultural heritage properties (Figure 5.20). The traditional rural roads and pavements are created according to the animal and pedestrian movements in the site. It represents the traditional fabric of the site, so it is crucial to sustaining it. The original pavements were constructed on the main roads with stone coating, while the secondary ones are composed of compressed soil. Main roads are asphalt today, and most secondary roads are covered with modern city stone. These applications destroy the authentic fabric of the site, the view of the streets, and harmony with the vernacular architecture. Additionally, it causes a change in the level of the street and harms the road, façade, and entrance relation. When the roads are enlarged and reorganized for vehicles, the unpredicted traffic, vibration, and weight of the vehicles cause deterioration at the building and demolition of some streets built on a cave (Figure 5.21).

Figure 5.20 Examples of a perpendicular street and stair to the slope

The traditional street systems have waterways for collecting rainwater. Also, the system of open-gridded waterways represents the water route from the primary source to the fountains, then to the troughs, and further through the water channels. This arrangement ensures that the running drinking and rainwater isn't wasted and can be directed to the terraced gardens for irrigation. Channels transfer water to the gardens, and these terraced gardens are irrigated through vertical and horizontal water channels. At specific points, stepping stones made of flat rocks facilitate crossing. Each garden's

entrance features a metal divider to control, direct, or block the water flow. Presently, these waterways are only partially utilized. Today, due to the new organizations of the roads, these waterways are destroyed, closed, or reorganized.

Figure 5.21 New street pattern (left), authentic street view (right)

Figure 5.22 Sitting elements examples in front of the houses on the road

Figure 5.23 Stone Upper Bridge in 2020 (left) and during restoration in 2022

Figure 5.24 New reinforced concrete Lower Bridge and a wooden bridge for passing the stream

Bridges are critical in the Bağpınar Settlement morphology as they connect two sides (Figure 5.23, Figure 5.24). Both the slope and water source at the valley necessitate the bridges. There are two bridges, which are called the lower and upper. While the lower bridge was destroyed and built as reinforced cocreate with asphalt covering, the upper one is a cut stone arch bridge registered as cultural heritage. Bridges are not only transportation elements but are also used as meeting points. The upper bridge, with the fountain and cemetery nearby, creates a small square. This space can be used for mourning, production, and celebration ceremonies.

5.2.2.3 Architectural Elements

Production spaces:

"Bezirhane" is the name for the closed production facilities where oil is extracted from plant seeds, representing an essential element of the cultural landscape. The oil extracted is referred to as *"bezir oil"* and is obtained through the processing of plants such as flax, sesame, rape, and poppy (Yıldıray Özbek, 2011). The process begins with roasting the seeds, followed by the rotational movement of large animals similar to a *seten* system to turn the seeds into flour, and it ends by filtering to extract the oil. It can be seen as a caved, masonry, or hybrid structure with at least a barn, oven, and *seten* spaces. Due to the region's endemic plants, each valley village had several *bezirhanes* as an economic source. According to the recording, Bağpınar also had 2 bezirhanes, but today they do not exist (Cömert, 2008).

The second agricultural production building is the mills. They represent the traditional industry ways of grinding the grains, significantly more prominent organizations than the sets and souks, without using animals or human forces—the mills in the valley are designed for working with the water flow energy. In the mill, water comes from the stream through a water channel to the upper level of the mill structure, which pours down to rotate the millstone. The post-production of the mills can be used as an economic source or household need. The mill in the Bağpınar has been demolished, and only some walls can be traced.

Hearth rooms *(mahalle fırını)* are social collective production spaces where traditional breads and bakery products like kete and halka are cooked (Figure 5.25). It has only one space to prepare the dough, including the stone hearth and furnishings. Women come with their dough and wood, then cook together while socializing. Today, Bağpınar has two hearths on the two sides. The northern side's hearth has been renovated and is ready for use. However, the growing preference for ready-made bread consumption and the changing population of the villages caused decreased demand for space. Nowadays, they cook bakery products together in the hearth for socio-cultural ceremonies. The vanishing of hearths appears connected to a shift in the villagers' value systems and a decline in women's inclination towards collaborative efforts.

Figure 5.25 Entrance and inside of the hearth room (left and middle) (Elagöz Timur) and communal bread production of the local women (Kayseri Metropolitan Municipality, 2020)

Figure 5.26 Above ground part of the north-east side dovecotes

Figure 5.27 Underground parts of the dovecotes in the Koramaz Valley (a-c) and the Bağpınar (d-g)

The northern-east valleys of the Kayseri include a unique production structure: dovecotes. They are called “güvercinlik” or “kuşluk” in Turkish by the locals, created as a barn, loft, or house for the wild pigeons (Figure 5.26). Pigeons were noteworthy features

of the Koramaz Valley with their contribution to the sustainability of nature. There is a group of dovecotes at the east hillsides of the northern side, which are abandoned or demolished. They also exhibit remnants of the historical stratification of Bağpınar. The roles of pigeon houses offer intricate insights into local-scale agricultural, commercial production, food culture, and human life during the Ottoman era. Due to their composition, the droppings served agricultural purposes, notably in vineyard and buckthorn cultivation. Also, The chemical called saltpeter, derived from pigeon droppings, was known to be used in making gunpowder (Kevseroğlu, 2023). Additionally, historical records indicate that dove manure was a traded commodity during the Ottoman period (İnceköse, 2019). Birds served as a source of food for humans during that time.

Besides their functions and intangible aspects, the dovecotes are outstanding vernacular heritage structures of the Bağpınar. Furthermore, the construction of dovecotes reflected the distinctive interaction between humans and nature in that era, designed to shield the birds from natural elements and potential threats posed by other animals. The construction system can be defined as a hybrid because the underground part is carved, and the ground part is a stone masonry system. It consists of two central parts: a tower or chimney (above ground) and a nest (underground). The tower is constructed with various types of high stone walls to shield the nests from external influences like the animals. The nest has no defined shape because of the carved, amorphous spaces comprising a human entrance, pool, perches, and a feeding tunnel (Figure 5.27).

Some arguments exist about the authenticity of some dovecotes due to their proper workmanship. As mentioned in the history of the Bağpınar and the valleys, the multi-ethnic and religious structure created plenty of religious buildings carved or masonry. Due to the traces of the dovecotes, it is thought that some of them could be columbariums, which are Rome cemeteries hidden from the ashes of the dead (Yazlık, 2019). This means that due to the changed habits and practices, the columbariums adapted to the dovecote, and today, they have adapted to the storages or are abandoned.

No communal hayloft, barn, or storage spaces in the village are observed. However, a couple of abandoned separated caves are called “in” by the villagers, and dovecotes are used as storage buildings. Due to the changed legal status of the village, husbandry is forbidden, and related buildings are abandoned.

Socio-cultural spaces:

The most constant buildings of the settlements have always been religious buildings, regardless of religion, race, or geography. In traditional Anatolian Muslim villages, the mosques are constructed in the middle, and all social elements surround them. Hence, it is hard to claim the same manner for the other religious buildings like a monastery, church, or chapel, which can be located far from the village center according to their function. Similarly, at the Bağpınar, the mosques are in the middle, while churches are far from the village. The changed position of the settlement in years could have caused the remaining churches to be far from today's settlement. Bağpınar has one mosque and several cave churches as the religious building.

Figure 5.28 The mosque of the Bağpınar; a (URL-1), b-e (Elagöz Timur)

Besides serving as places for religious practices, mosques also serve as gathering spots, predominantly facilitating social interaction among men, akin to the village square. Beyond the daily Islamic ritual prayers and the weekly Friday prayers, mosques are frequently utilized during religious eids, special days (kandil), and funerals. The mosque constructed in 1976 is in the center of the northern *geçe* without a courtyard. It is built with a rectangular plan in the east-west direction. The Harim space is located in the east

part, while the next (son cement) and women part (kadınlar mahfil) are at the west part. The building, constructed using a cut stone masonry system, is supported by a wooden column axis in the east-west direction. The wooden columns are bonded with wooden beams, and secondary beams perpendicular to the main ones are covered with sal stone to create an earth roof. Then, a pitched roof system was added for ease of maintenance. The west façade has an entrance with an arched gate, while the east and south facades are too simple, with rectangular windows with arch shapes inside. The single minaret southwest of the mosque is new. The corner minaret on the southwest corner of the roof is the original minaret of the structure (Yıldırım Özbek & Arslan, 2008).

Fourteen rock-carved underground structures are thought to have been built at X or XI centuries for use as churches or related functions at the Bağpınar Village on both *geç*e's hillsides (Kayseri Yeraltı Yapıları Envanteri, 2020). The most outstanding is called Bağpınar (Ispıdın) Lower Rock Church or Beşaret Rock Church at the south hillside of the village. The church architecture follows a typical cross-shaped plan. There is a small narthex in the north. The central part where the arms of the cross intersect is square, covered by a dome transitioned with pendentives. The entrance to this single-nave structure supported by three columns on the east-west axis is through an arched door carved into the north wall. The rectangular-shaped side aisles are covered with barrel vaults. The carved rock walls covered with plaster for creating colored frescos represent the significant stories of Christianity (Karakaya, 2013). While Beşaret Rock Church is registered as a monument, the remaining rock carving spaces are registered as archeological.

Figure 5.29 Entrance of the South cave church (Beşaret Kaya Kilisesi) (left), inside wall paintings (middle) (Elagöz Bahar), and entrance from the inside (right) (Kayseri Metropolitan Municipality, 2020)

Figure 5.30 Dome and apse of the church

Bağpınar has one primary school dated 1911, located south of the northern side (Figure 5.31). The school is designed as a two-story structure with a basement and ground floor with an expansive courtyard. The basement was constructed not for spatial needs but to level the sloping terrain north-south. Rough stone was used for the basement level, while finely cut stone was used for the ground floor. Access to the school's ground floor is through a decorative, segmented-arch door placed in the center of the northern facade. The school comprises three main rectangular spaces oriented north to south. One of these spaces was divided into two, housing the administrative unit, while the remaining three areas were utilized as classrooms. The flooring and ceiling of the structure were constructed using wooden panels and a pitched roof covered with tile (Yıldıray Özbek, 2013). Due to the population decreasing, the school is closed, and the building is adapted as a funeral house. Also, there is public housing for the teachers in front of the school. However, it is used today as a dwelling by a villager.

Figure 5.31 Old primary school of the village

Similar to other socio-cultural buildings, each Valley settlement includes several baths. According to the 19th-century recordings, there were two baths, but today, traces of them cannot be found (Cömert, 2008).

Figure 5.32 Abandoned shop (left) and public housing for teachers (right)

A shop space, located under the courtyard of a house due to the slope, is found abandoned at the northern geçe. There is no information about the type of commercial products, but today, it is used as storage.

5.2.2.4 Understanding Vernacular Architecture over the Housing Units

In Bağpınar, residential houses, comprising most of the traditional architectural fabric, stand out in the rural landscape (Figure 5.33, Figure 5.34). While these structures exhibit similarities in materials and techniques, they vary based on the users' needs and financial situations. Although it might not be easy to comment on the timeline of these residences or find examples that have remained unchanged till today, examining the general characteristics of settlements and housing structures allows for outlining the basic principles of traditional design. The houses, designed in accordance with the traditional lifestyle, prioritize functionality and have a rectangular shape. While they vary in quality due to slopes and interventions, the houses are generally two-storied, carved from rock, or built using stone masonry. Situated perpendicular to the streets on plots divided by the slope, these cubic-shaped houses with courtyards face toward the landscape. The placement of the houses takes advantage of the slope to ensure they do not obstruct each other's view and respect each other's privacy. When examining the socio-cultural context of the village, it is noted that there are many influential figures known as "ağa" by the villagers, who hold high economic standards, recognized even by surrounding settlements

and the city center. This income gap is generated in different sizes and details of the dwellings (Figure 5.52, Figure 5.53).

Figure 5.33 Housing units at southern *geçe*

Figure 5.34 Housing units at nouthern *geçe*

To make accurate assessments during the fragility calculations in RUHET studies, it's essential to conduct a detailed examination of the traditional architectural heritage of rural landscapes. This examination will cover layout design, spatial utilization, construction systems, and material characteristics.

Spatial and Façade Organization

In Bağpınar, house floor plans and facades tend to repeat as long as living conditions remain unchanged. However, user's economic circumstances and special needs have led to some variations in the structures' interiors. Most of these two-story houses' ground floors are designed as barns and service areas. In contrast, the upper floors consist of primary living spaces such as living rooms, *sofas,* terraces, and *köşks*. Despite being densely built in rows along the slopes in an attached arrangement, most houses have a courtyard or shared open spaces for communal use along the street (Figure 5.35, Figure 5.52, Figure 5.53).

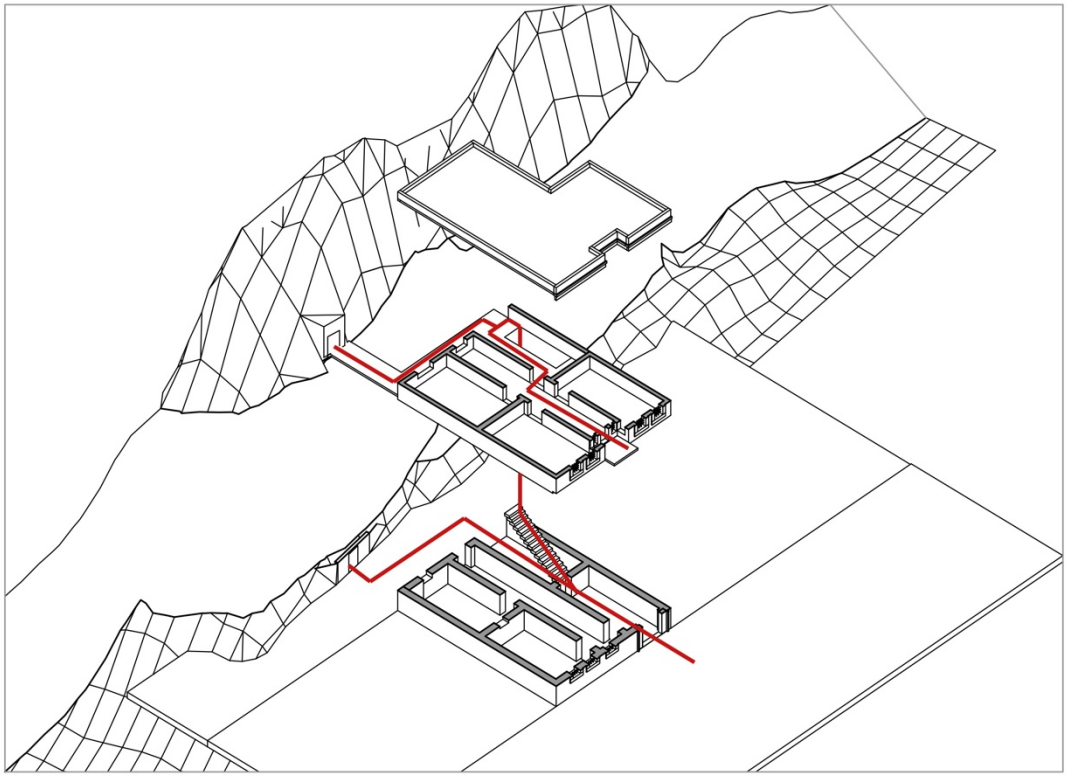


Figure 5.35 Schematic representation of the circulation and plan of Bağpınar house

The traditional rural architecture of Kayseri is characterized by a unique spatial organization developed through the repetition of basic room types. The assembly of the same unit, influenced by various user desires and needs, environmental factors, and geographical conditions, determines the house's architectural design. The room we define as the house's starting point or basic unit is the smallest dwelling example. The separate planning of service areas in the spatial organization of the house subtly emphasizes the living room (Çorapçıoğlu et al., 2008).

The orientation of the houses has been developed to have a view of the shore for both *geçe*. There are two main types of entrances to the houses; in adjacent row houses, the entry is directly into the building, while in larger plot houses with expansive courtyards, entry is through the courtyard gates. Depending on the size of the houses, entrances for the barns and outbuildings have also been added. The main entrance space is usually designed as a semi-open area and connects the ground floor spaces. These areas can be described as semi-open passages, known in the region as "kabaltı," where the second floor is constructed (Figure 5.36). Daily practices primarily occur within the circulation areas connected by the entrance, between the courtyard and enclosed spaces.

The ground floor spaces may vary depending on the size of the houses. They typically consist of a barn, storage, winery (*şirane*), kitchen, winter rooms, caves (*in*), and toilets. Generally, the ground floor spaces are introverted, and their outer facades have small windows for privacy. In contrast, the windows facing the inner courtyard are designed larger to allow more light in.

Figure 5.36 Entrances with *"kabaltı"* typology

The ground floor spaces are fortified with thick, load-bearing stone walls. In Bağpınar, where agriculture is the lifeblood of the community, animal husbandry is limited to meeting the family's needs. Consequently, the barn spaces are also limited. While these spaces are usually within the main building, they can also exist in spaces carved into rocks, known as' in,' located behind courtyards. The barns are designed for animals to move, rest, access feed, and dispose of waste. One reason for placing stables within the housing in Bağpınar is to efficiently utilize heat, ensuring both the animals and inhabitants stay warm. A hay storage area where animal feeds can be preserved can be designed as a new space associated with the barn or stored within the barn (Figure 5.38).

Figure 5.37 Stair types of Bağpınar traditional architecture

Figure 5.38 Barns at ground floor

Figure 5.39 Storage and haylofts

Figure 5.40 Closed kitchen *(tokana)* and equipment

Storage areas are also essential and inseparable parts of rural life (Figure 5.39). Products from agricultural and livestock activities throughout the summer are stored in storage spaces and specially designed furniture. Various wheat products, dried fruits, molasses, wines, pastes, oils —products of collective practices— or firewood and coal

should be stored in dry and cool environments. Unlike the barns, storage spaces are generally dark areas accessed from a courtyard independent of the main building. In Bağpınar, underground carved rooms (*in*) accessible directly from the courtyard or terraces are widely used as storage or cellar spaces due to their climate conditions, providing convenient storage locations.

The kitchens, including the ovens, are among the most significant service areas on the ground floor (Figure 5.40). In traditional Kayseri houses, kitchens are referred to as "t*okana*" or "*tandır* house" (İmamoğlu, 2010). These kitchens can be seen in two forms: enclosed and semi-open. Enclosed kitchens serve as areas for cooking during winter and as spaces to warm the ground floor, which can even be a living area. These spaces typically include organizations for meal preparation, storage cabinets, and a single piece of stone called "*çağ*," used for washing and equipped with a drain for water disposal. Cooking areas can be separated from the main space with an arched passage. In some cases, there are hearths with chimneys at higher levels. The most critical components of these spaces are the *tandır* and hearths. The *tandır*, a type of oven suitable for heating and baking specific regional breads, is made by digging a pit. Since these *tandır* and hearths are also used for heating purposes, life during winter revolves around them. While daily life continues in the *tokana*, sometimes, a *tandır* is placed in the middle of rooms to provide warmth. These spaces are called "*tandır* room" or "winter room."

A second *tandır* and hearth can be found in the courtyard. These are usually semi-open areas enclosed by an arched wall on three sides, although depending on the plot size, they can also be completely open and more minor. Semi-open cooking spaces are square-shaped, mostly covered, elevated by 2-3 steps from the courtyard level, and feature a wall with a hearth and *a tandır* in the middle. Meals are prepared here during the summer months, and preparations for winter take place here in autumn (Figure 5.40, Figure 5.41).

If weather conditions permit, all daily activities are shaped in the courtyard on the ground floor. In Bağpınar, courtyards are spaces where privacy is ensured, and the relationship with the street is separated by either the buildings or garden walls. Depending on the land's location and the plot's size, smaller courtyards on the southern side are positioned between the main building and the slopes, wholly isolated from the street. On the northern side with larger plots, direct access to the courtyard is available, and there may even be windows in the courtyard walls.

Figure 5.41 *soku*, wheat storage and water well

Figure 5.42 Courtyards

During summer, all kitchen activities take place in these courtyards where post-production equipment is located, such as *şirane*, *tandır*, and *soku*, and semi-open spaces allow for collective production to coexist. Additionally, small gardens, trees, and grapevines suitable for horticultural activities can be found. These areas, not only utilized for production but also for relaxation, are often adorned with flowers. Similarly observed in rural Anatolian architecture, toilets termed "*hela*" are discreetly constructed in a courtyard corner. Without any connection to a sewage system, these facilities collect waste by digging a pit and elevating the floor by a few steps (Figure 5.42, Figure 5.43).

Figure 5.43 Courtyards

Figure 5.44 Semi-open kitchens at courtyards and *dorak* stone (right)

Figure 5.45 Bezirhane examples at courtyard and inner spaces

Passing to the upper floors is made through open staircases from the semi-open passages termed "kabaltı" or from the courtyard. None of the examined houses in the village had a closed staircase. These staircases, typically facing the courtyard and built with *sal* stone, are constructed as masonry and could be single-flight or L-shaped. It can be reached in the upper floor rooms by passing through the *sofa* or corridor. The upper floors comprise living spaces identified as the living room or *sofa* and balconies defined as "*köşk*" (Figure 5.46).

Figure 5.46 Winter room examples at ground level

As in traditional Turkish house architecture, living rooms are also fundamental in Bağpınar's rural architecture. The limitations of the construction system determine the dimensions of rooms. They are generally calculated based on the maximum floor dimensions that stone masonry can support without any columns. The variation in the flooring leads to the division of the room into three parts: "*seki*," "*seki altı*," and "*cağ*." Although "*sek*i" and "*seki altı*" examples are not found in every house in Bağpınar, they are significant elements of Kayseri's traditional architecture. Due to the floors being the areas of most change in houses, there might not be many "seki" areas. The "seki altı" is an area covered with "sal" stone where shoes are removed. The "seki," on the other hand, is the main living space with raised floors designed as "sal" stone or wood, referred to as "sedir," which serves as seating. The flooring material is observed as wood in winter rooms and "sal" stone in summer rooms (İmamoğlu, 2010). The walls of the rooms are ornamented with various wooden decorative elements (Figure 5.47, Figure 5.48).

Figure 5.47 Sofa and summer room examples

Figure 5.48 Summer room examples

Bathrooms in houses are "cağ" spaces. These spaces can be placed on the floor in one corner of *aşağı seki* or designed within a cupboard-like niche with a door to use as bathrooms. These covered wet areas, commonly found in Anatolian architecture, can also be called washing niches or shower cabinets. Open "cağ" areas are preferred for ablution, handwashing, or bathing children. Especially those used as bathrooms have a raised area in the middle to sit on. Water is drained directly outside from all rooms. In these washing stones found in kitchens, there is a hole in the middle to drain the water (Figure 5.49).

In contrast to the ground floors, the upper floors in Bağpınar are designed to be extraverted. Rooms open up to the view through large windows and a corner that leads from the living space. Especially because Bağpınar houses are situated on slopes with valley views, most of the houses have köşk, which are semiopen spaces with various sizes. These features protrude from the facade like balconies supported by stone buttresses or can be created by forming semi-open spaces without disrupting the cubic form of the

building. According to İmamoğlu, these spaces are used as guest rooms for summer entertaining guests, family living spaces, and places where youngsters spend their time.

Figure 5.49 *Cağ* examples in room (left and middle) and kithchen (right)

Figure 5.50 Ornamentations

In Bağpınar, characterized by rural settlements, buildings have facades designed with simple yet intricate details and proportions of elements (Figure 5.50). Apart from corner plots, most buildings have a single significant facade facing the street. These facades are made of cut stone without plaster, allowing the construction system to be easily observed. While the sizes of windows vary according to the functions of spaces, ground-floor windows facing the street are usually small, and upper-floor windows are larger. Rectangular windows have raised stone lintels and sills formed by molding. Arches providing decoration on the facade are prominently seen indoors and *köşks* (Figure 5.54). Embellishments and colors on the facades are generally found on the arches. Cantilever parts on upper floors, supported by stone buttresses, add dynamism to the facade by facing the landscape. Although it's rare nowadays due to changes in roofing

systems, "çörten" (gutter) is a significant decorative element on these facades. The straightforward and balanced design of these facades in rural-style buildings forms the fabric of the rural heritage.

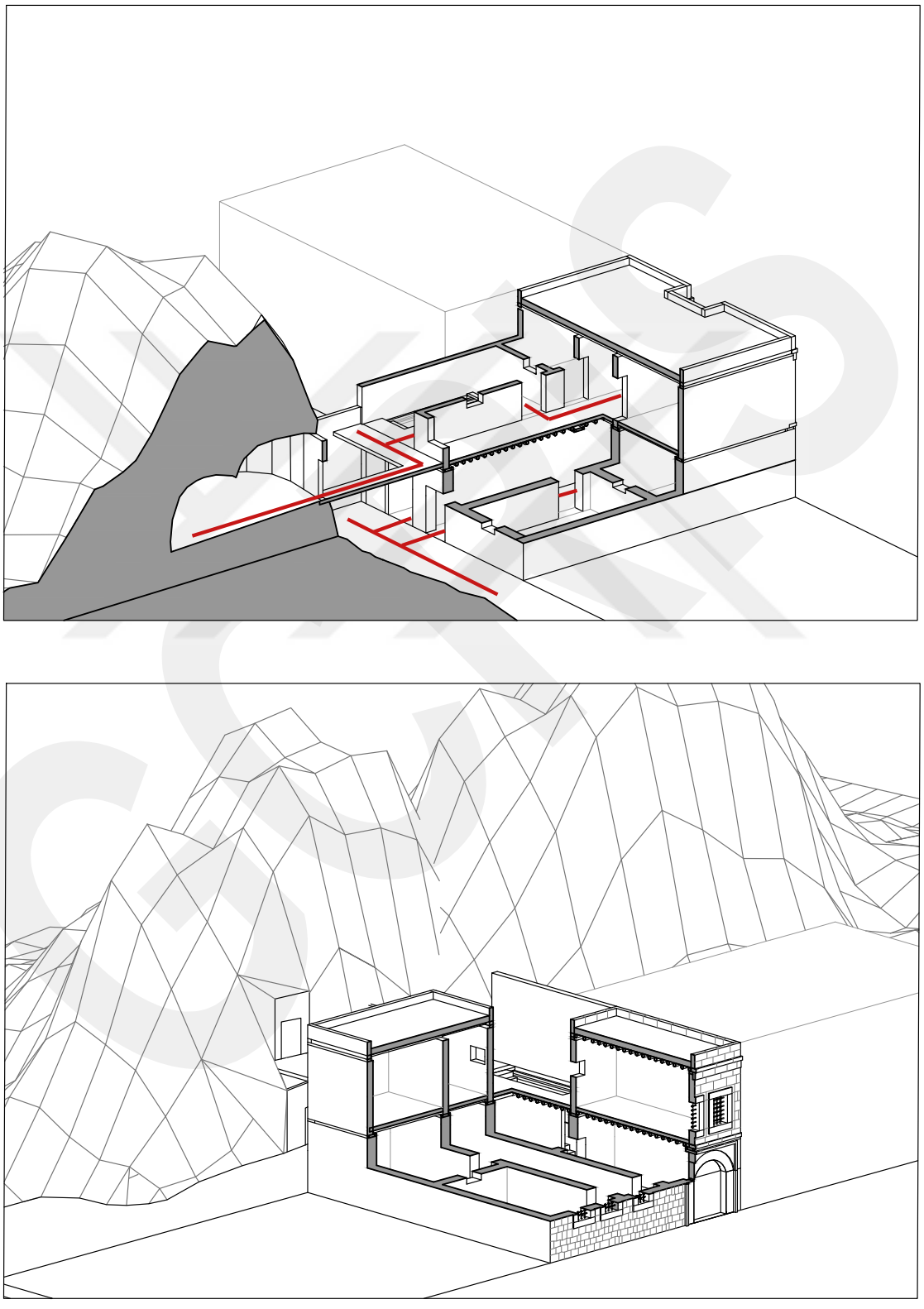


Figure 5.51 Perspectives from a traditional Bağpınar house

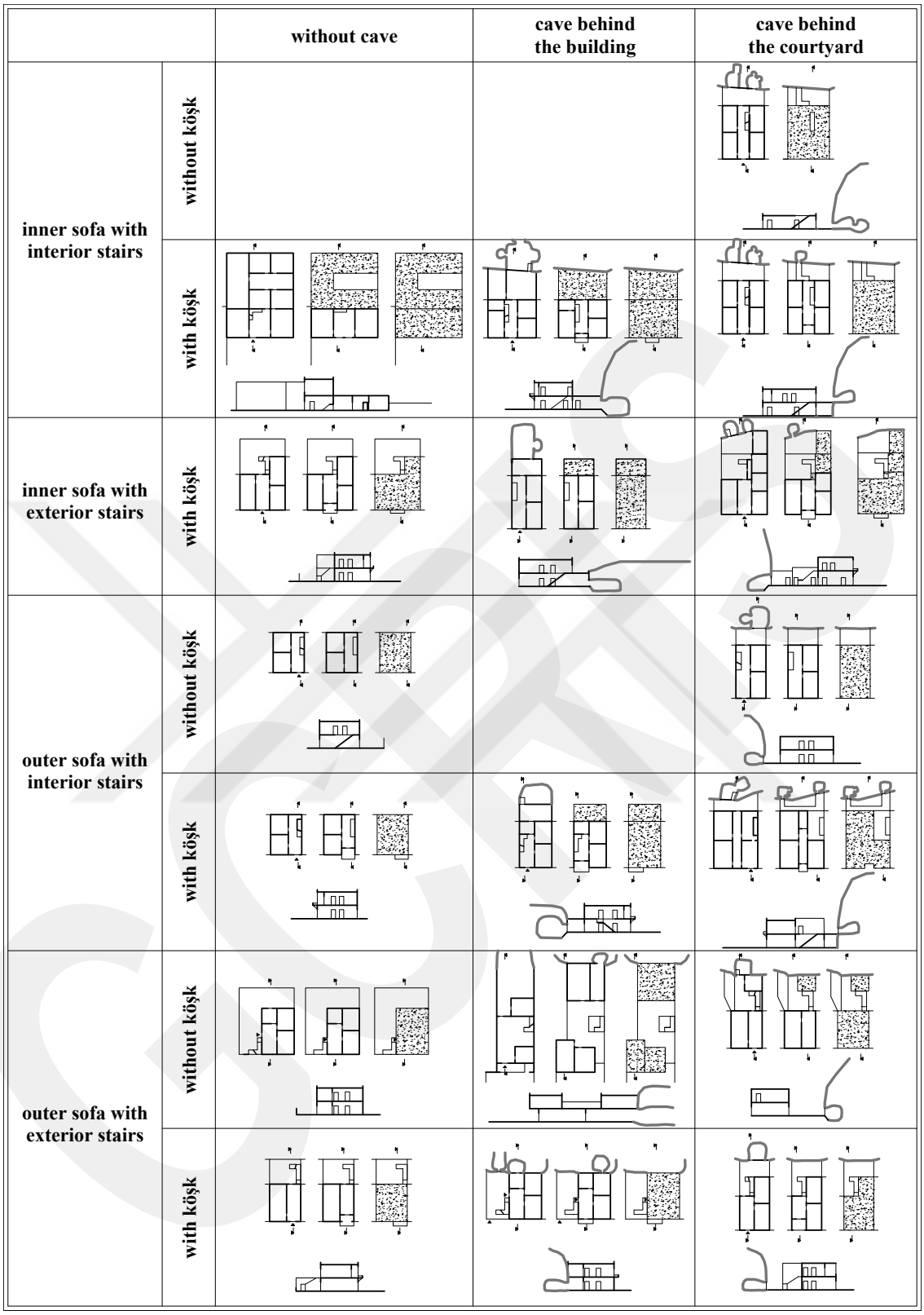


Figure 5.52 Typology of the Bağpınar vernacular architecture.

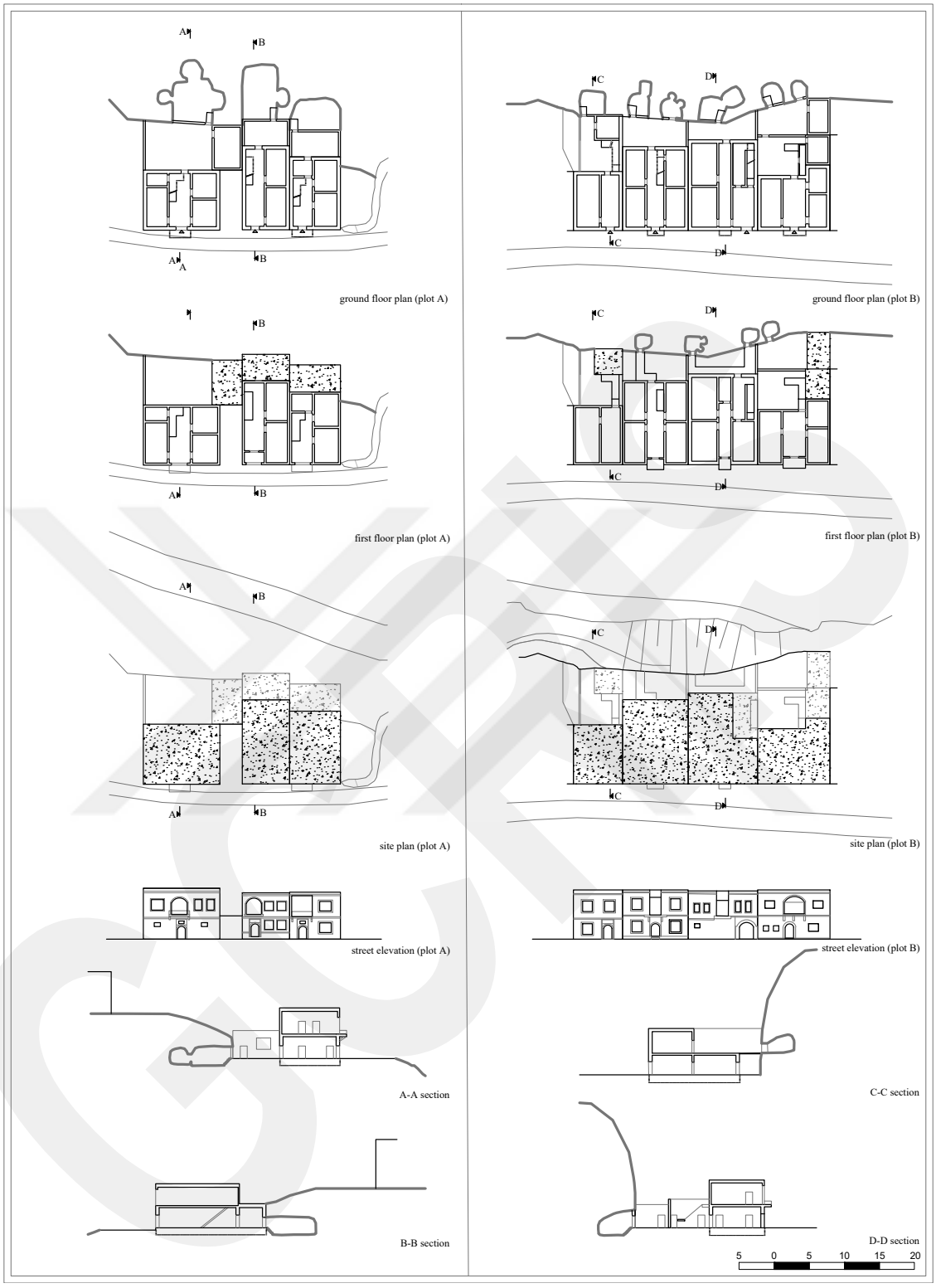


Figure 5.53 Plot typologies of the Bağpınar

Figure 5.54 *Köşk* examples

Material and Construction System

Kayseri's geological formations have led to unique rock-carved settlements. Volcanic tuffs, offering earthquake resistance and insulation, have shaped the region's architecture. Bağpınar continues this tradition of hillside settlements. To explain the village's vernacular material and construction system, it is crucial to understand the geographical structure of the region. The diverse geological structure of Kayseri has endowed it with a significant variety and potential of stones (Figure 5.55, Figure 5.56). Among the most influential stones shaping the architectural structure of Koramaz Valley and, consequently, Bağpınar are the porous and easily malleable tuffs. The unique geological formations in this area

Figure 5.55 Usage of the material

have led to the creation of settlements carved from rock, shaping the daily practices that define the region's identity. These rocks, integral to Kayseri's distinctive architectural style, have significantly influenced the cultural landscape. Volcanic tuffs, known for their

lightness and adaptability to ground movements, offer earthquake resistance and insulation due to their porous nature. These characteristics have allowed them to be carved into various functional spaces, including religious and defensive structures, living quarters, barns, cellars, pigeon lofts, and more, particularly on sloped terrains.

Bağpınar's development on these slopes continues the tradition of carved hillside settlements, seamlessly integrating recent morphologies with existing carved structures. Nearly every residence in Bağpınar has its own designated "cave" space (Figure 5.61, Figure 5.62). Cave and masonry buildings can intersect in different circumstances, as they can be behind or under the masonry structures. The carved spaces below and behind the living areas are linked to the main structures through horizontal and vertical passages. However, recent modifications have occasionally compromised their original structural integrity, necessitating the addition of masonry elements for support. These underground rooms, interconnected and supported by arches, connect to the masonry buildings. One of the challenges in studying these structures is identifying the original functions of these spaces, especially those utilized for storage due to their specific climate-controlling qualities. The tradition of carving architecture, valued for its ideal storage conditions, presents difficulties in accurately dating these spaces up to recent times.

Figure 5.56 Stone and wood at the Bağpınar architecture

Unlike rock-carved structures, masonry and hybrid buildings are also significant components of Bağpınar's vernacular architecture (Figure 5.60, Figure 5.61). Various tuff stones, mainly produced in the region, are used in different functions and sizes of masonry constructions. These are referred to as "yonu (cut stone)," "kaba yonu (rough stone)," "sal," "kevek," and "kara taş" (Neciboğlu). Primarily, stone is used in various walls, stairs,

and furniture. The second most commonly used material in construction is wood (Figure 5.56). Juniper wood is used as primary and secondary beams for flooring, while pine wood is utilized for

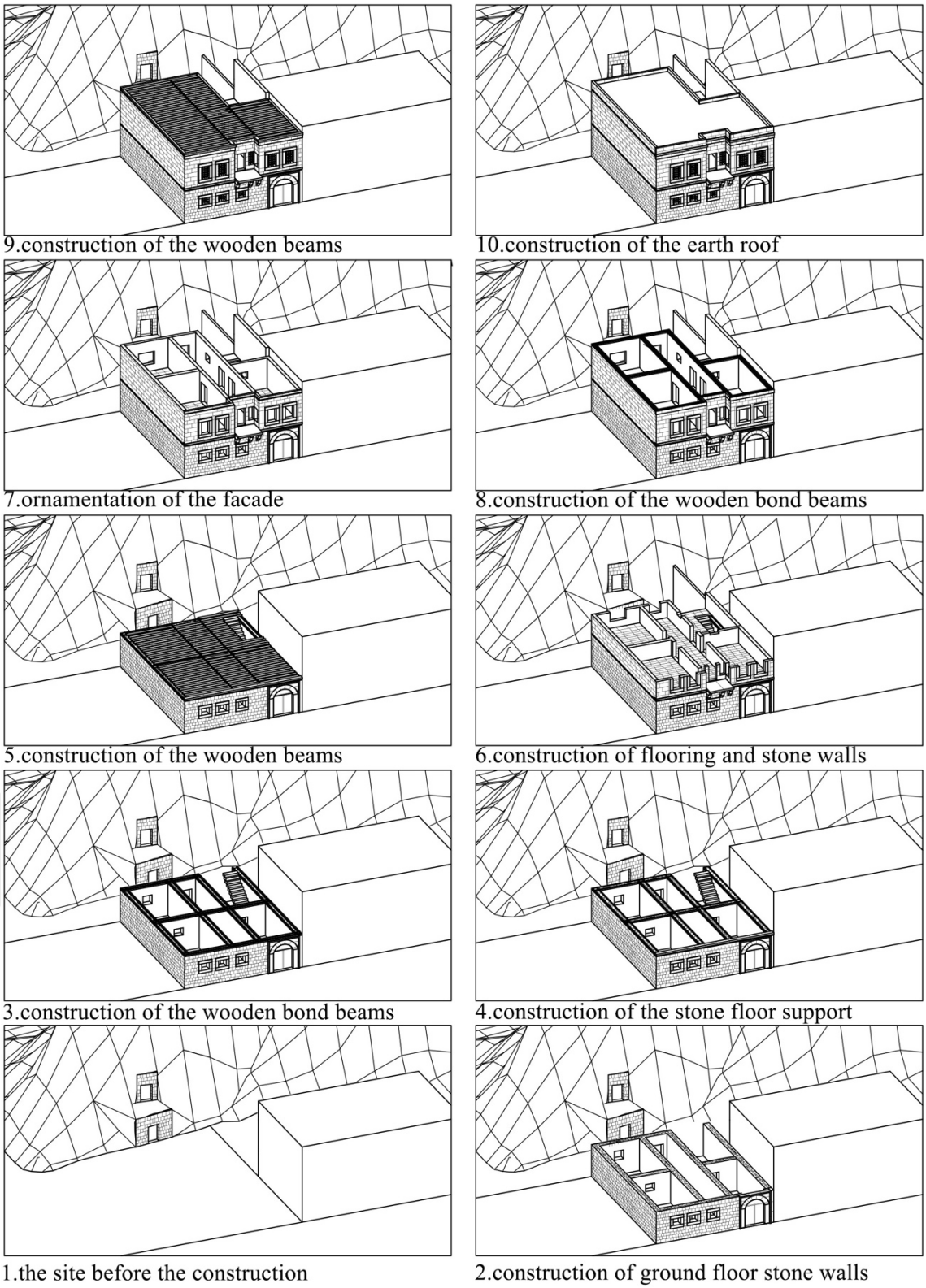


Figure 5.57 The construction stages

windows, doors, shutters, furniture, and decorations. Earth is another crucial building material in traditional Bağpınar structures. It's predominantly seen on roofs and later in mortar joints and wall plasters. Iron is found in various anchors and window fittings. Additionally, gypsum is used in hearth and shelf decorations.

Figure 5.58 Usage of the stone arches at ground level

Figure 5.59 Floor systems

Due to the ground being rocky, buildings are typically constructed without foundations. However, when deemed necessary, a foundation cavity is excavated and filled with large stones to prepare the ground for construction. Compacted soil overlaid with tightly placed "sal" stones usually creates the ground floor. Only rooms used as winter quarters have wooden floors to retain warmth. Ground floor walls can extend to around 1 meter and are constructed using rough-cut or cut stones. Wooden beams are laid on top of the dry stone walls, supported by a support stone at floor level, and then covered with kevek stones or thin slabs of "sal" stones, the coarseness of which depends on the function of the space (Figure 5.57, Figure 5.58, Figure 5.59).

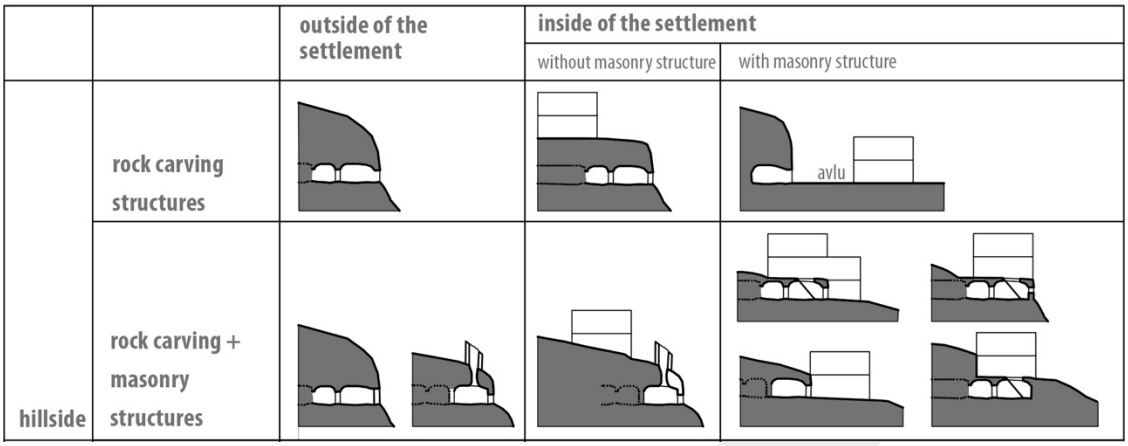


Figure 5.60 Typology of the relation between buildings and caves (Elagöz Timur & Kevseroğlu, 2022)

Figure 5.61 Caves

While some intermediate floors incorporate earth, most are solely composed of "sal" stone flooring. Cantilevered balconies from the main facades are constructed with "sal" stone flooring supported by stone or wooden buttresses. Roofing consists of "sal" stones filled and compacted with clayey soil to create earthen roofs. Stone arches, lintels, or sills support window and door openings on load-bearing walls. The inner surfaces of the walls are finished with a layer of earth plaster mixed with lime. Apart from wooden railing-supported staircases made of "sal" stones, no other types of stairs have been observed in Bağpınar structures, all supported by load-bearing walls (Figure 5.57).

Figure 5.62 Caves

5.2.3 Legal Status

The identification and registration studies in Bağpınar began with the registration of Beşaret Rock Church, Upper Bridge, and Fountain by the decision of the High Council of Immovable Antiquities and Monuments (Gayrimenkul Eski Eserler ve Anıtlar Yüksek Kurulu or GEEAYK) on March 12, 1977, with resolution number 360. As Bağpınar was once a village within Gesi, which was a town at a certain period, it was encompassed within the declared conservation areas of the "Gesi Conservation Development Plan," approved by GEEAYK on February 5, 1982 (Yücel, 1996). Consequently, a part of Bağpınar has been registered as a natural and archaeological conservation site (Figure 5.63).

Following a reevaluation of the region by the High Council Immovable Cultural and Natural Heritage (Taşınmaz Kültür ve Tabiat Varlıkları Yüksek Kurulu or TKTVYK) under the Ministry of Culture and Tourism, it was decided on July 19, 1985, with resolution number 1298, to continue the registration of the structures that had been registered in 1977. Subsequently, through the decision of the Kayseri Cultural Heritage Preservation Regional Board (Kayseri Kültür Varlıklarını Koruma Bölge Kurulu or KKVKBK) on December 18, 2012, with resolution number 450, the mentioned bridge and fountain were registered as "immoveable cultural assets requiring first-degree protection." Similarly, Bağpınar (Ispıdın) Lower Bridge was registered as “Group 1” by the KKVKBK on November 22, 2017, through resolution number 2948.

Figure 5.63 Archeological site of the Bağpınar

In 2020, within the context of UNESCO's World Heritage Tentative List, Koramaz Valley, including Bağpınar, was accepted under the criterion of "to be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change." This development heightened awareness of the region's heritage values and accelerated conservation efforts.

With the decision of the KKVKBK on October 26, 2023, numbered 7283, one mosque, two fountains, and two cemetery areas were registered as “Group 1”, while three residential structures were categorized as “Group 2” (Figure 5.64). Consequently, Bağpınar received registration decisions beyond monumental structures for the first time. Through the decision numbered 7284, the area where the traditional settlement pattern exists in Bağpınar was declared an urban protected area, establishing “transition period building regulations” to be applied until the development of the Urban Conservation Plan (Figure 5.65).

Figure 5.64 The registered houses

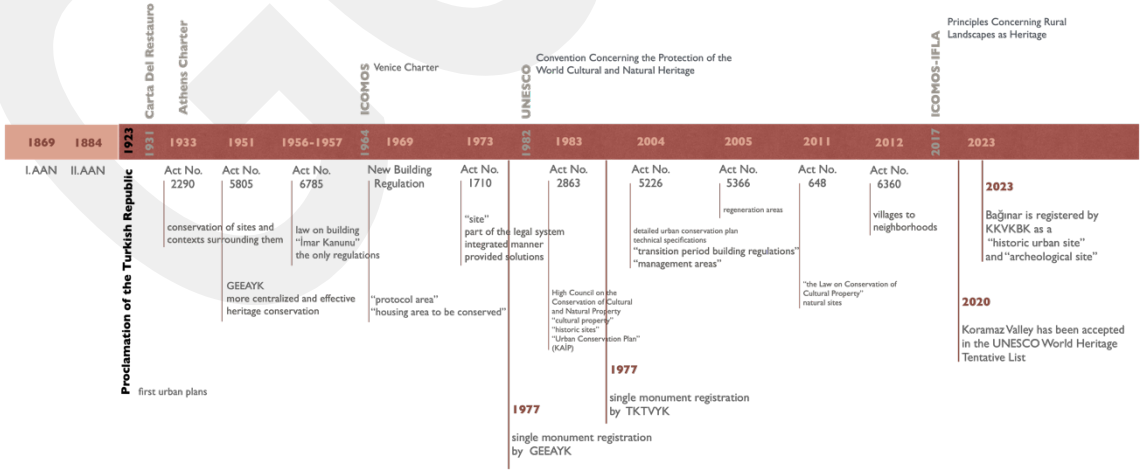


Figure 5.65 The timeline shows critical developments in law and regulations in Türkiye and conservation process of Bağpınar

5.3.4 The Reasons of the Transition in Bağpınar

Rapoport claims that the settlements are primarily influenced by socio-cultural factors before considerations such as climate, land choice, accessibility, materials, and construction technology come into play (Rapoport, 1964). As explained in Chapter 2, due to the dynamic relationship between the habitus and vernacular architecture, the changes cause the loss of cultural heritage values. At this stage of the model, it is critical to examine the threats and their consequences on the cultural heritage to find out which changing factors and habits can affect the properties in which manner. Therefore, RUHET offers to create intersection tables for deep analyses in the deductive method, starting from the settlements and continuing with the elements of the buildings.

The changes triggered by the habitus transition can be separated into three titles: social, natural, and structural. As explained in the historical context of the Bağpınar, the demographical structures have altered over the years dramatically. These changes created reverseless results on the habitus. The ethnic and religious diversities turned today's structure due to the political developments at the land. The Industrial Revolution promoted living in cities in order to the rural landscapes while offering new technologies to agriculture, husbandry, and past productions. Consequently, the number of Bağpınar inhabitants decreased, and the removed ones changed their production habits. In light of these developments, the understanding of the living and demand for comfort conditions are translated even for the rural inhabitants.

Rural life depends on the natural environment with critical practices. Differently from the cities, agricultural and husbandry production shapes the practices of the rural people, their habits, and, accordingly, the built environment. The decreasing flow of the stream has caused vital alteration and ecological changes. Another severe natural effect for the Bağpınar is the several earthquakes, landslides, and epidemics.

Administrative investments in rural landscapes are naturally required and should be supported for the quality of life. However, realizing it in the rural landscape as heritage examples without conservation precautions can cause critical loss. After providing some infrastructure services, the region's most severe development is the village's changing status to the neighborhood with the Municipal Law (no: 6360 / 2014). This provided new opportunities to the Bağpınar, like effortless transportation, new infrastructure services, new road organizations, etc., while damaging the village's rural character with new

regulations like forbidden husbandry between the living units. The effects of these developments on the living practices and tangible and intangible cultural heritage values are explained below.

5.2.5 The Consequences of the Transition in Bağpınar

5.2.5.1 At Settlement Scale

Similarly with the documentation studies realized at the former stages of the application of the model, the settlement is investigated according to the open and closed rural heritage properties (Table 5.2). The open-air spaces mainly consist of the production areas in the rural settlements. Bağpınar rural landscape production is primarily based on the stream, and the stream's decreasing flow due to the climate and ecology change has resulted in reducing the grasslands' productivity. In addition, the tendency toward the urban economy rather than the rural one decreased agriculture. Also, due to the municipality's urban plans, some fields and grassland areas are inverted to the construction zones. Adding to these issues, industrial production methods were replaced with traditional ones, and şirahane, seten, soku, bezirhane, and mill spaces were abandoned. Providing easy access to Kayseri's shopping opportunities, like bakeries and markets, caused the end of the baking tradition, thereby abandoning the public hearths. Feeding the pigeons is a unique husbandry facility for the northern-east valleys of the Kayseri. They are used for various activities like trade and agriculture or as food. However, the pigeons left the land due to the changed climate and decreased water sources, and dovecotes remained unused.

Socio-cultural properties of the vernacular rural settlements are generally linked to the inhabitants' socio-economic practices. The disappearance of traditional social and community production activities such as boiling molasses, making bulgur, etc., and the creation of new public squares or children's parks by the municipality into public squares have transformed traditional squares. Fountains, as another traditional gathering space, were created to reach the water to locals and today are used only as recreational spaces due to the water infrastructures in the building. This technological development caused the gradual loss of the bath tradition and buildings. The cemeteries and religious buildings that do not belong to the Muslims are abandoned and destroyed after their users leave the area. In addition, the primary school is closed because of the fewer students (Table 5.3).

Table 5.2 Changes due to the Habitus

settlement			Changes due to the Habitus / Bağpınar Village				morphology
			On heritage	**On habitus**			
				social	*natural*	*locational*	
Rural open air environment	production	*field garde*	Abandoning the areas reserved for agriculture and animal husbandry and giving permission for construction on them and using different purposes	Tendency to urban economy rather than rural economy	Termination and reduction of some agricultural and livestock activities due to changing climatic factors	Depending on the changing administrative status, establishing new restrictions for agriculture and animal husbandry activities, giving permission to fields and pastures for construction	All open and built areas in the settlements are part of the morphology and the changes on them directly affect the morphology.
		grassland					
		şırahane	abandonment, demolition or reuse in new functions such as decoration	Decreasing rural production, switching to industrial methods instead of traditional local production			
		Seten soku					
	Socio- cultural	*square*	Building new city squares, playgrounds and parking lots, disusing traditional squares	The disappearance of traditional social and community production activities such as boiling molasses, making bulgur, etc.		New urban public space arrangements due to the changed administrative status	
		fountain	Drying or of fountains, nonuse or just using them as a recreation area	Water technologies in the houses	Depleation of water sources		
		cemetery	Looting, destruction, or abandonment of non-Muslim cemeteries	Gayri-müslim nüfusun göç etmesi Migration of non-Muslim population			
	Transportation	*Street*	Replacing and widening traditional ground or stone-paved rural roads with asphalt and interlocking stones, adding new bridges or widening old ones	With the developing technology, the need for more hygienic and vehicle traffic-friendly roads, the need for new roads as a result of the expansion of settlements		The emergence of new street needs depending on the changing administrative status	
		bridge					

Depending on the changed administrative status of the settlement, Kayseri Metropolitan City Municipality built new roads that strengthened the link between the city and its neighborhood. This road is designed similarly to the urban context without considering traditional road patterns and bridges. Also, these vehicle-oriented roads caused them to be used more, and this traffic triggered the underground and aboveground cultural heritage with the creation of vibration. Solving the accessibility problem to the city and reaching the shopping facilities has resulted in closing the village shop (Table 5.3).

Table 5.3 Changes due to the Habitus on rural built environment (continuous at the page 166)

settlement			Changes due to the Habitus / Bağpınar Village				morphology	typology
			On heritage	**On habitus**				
				Socio-economic (including intangible heritage)	*natural*	*locational*		
Rural built environment	Production units	*bezirhane*	The abandonment and destruction as a result of the effects of habitus, or using as a warehouse.	less economic income as a result of industrialization	Not growing oil-extracting plants such as buckthorn	Decreasing agricultural activities as a result of enlargement of the city periphery	All open and built areas in the settlements are part of the morphology and the changes on them directly affect the morphology.	Changes seen in all units that determine the typology of the settlement, especially the residences, also transform the typology.
		oven		End of the bread baking tradition		Improved access to bakeries and markets in the city center		
		mill		Industrialization, Lack of economic income from agricultural production	Lack of raw materials due to the decrease in local agriculture	Decreasing in rural economic activities due to the expansion of the city's borders till the settlements.		
		dovecote		the disappearance of the tradition of breeding pigeons, Lack of economic income from husbandry	Migration of pigeons due to the decrease of water resources	the restriction of animal husbandry in rural areas as a result of the settlements being the neighborhood of the central district of the Metropolitan, start to gain of economic income from the converging city		
		barn hayloft		Lack of economic income from husbandry	Decreasing rangelands			
	Socio-cultural units	*Religious building*	Deterioration due to abandonment of religious buildings belonging to minorities, their destruction by looting, their reuse in whole or in part as new functions such as housing	Immigration of the non-Muslim population				
		educational	Abandonment, demolition, looting or change of function of closed schools	Abandonment of their schools due to the migration of minorities, Migration of the young population to the city		With the city's growing through the village and the development of transportation opportunities, the schools in the city are preferred.		
		bath	Collapse due to disuse, and deterioration	adding or improving bathrooms in houses				
		kahvehane	Interventions based on changing user demands	Decrease and change of *"kahvehane"* users due to changing lifestyles		Providing access to different social activities with easy access to the city		
	Commercial units	*shop*	Collapse due to disuse, and deterioration	Decreasing commercial activities due to changing demographic structure		Shopping from the city after the enlargement of the city throughout the village and the ease of transportation		

settlement	Changes due to the Habitus / Bağpınar Village				morphology	typology
		On heritage	**On habitus**			
			Socio-economic (including intangible heritage)	*natural*	*locational*	
	Housing units	Demolish, changes on plan scheme, form, function, and articulation due to the abandonment, adding industrial systems to the traditional construction system, using industrial materials instead of traditional ones, and changes on ornaments	Changes on user requirement about structural strength and stability, thermal comfort, hygiene, security, ease of maintenance, air conditioning, new aesthetic understanding, The need for new space due to the change of rural production and traditional practices, abandonment or user change due to the population movement, the disappearance of traditional construction activities	Decline in rural production, change in economic resources, decrease in natural resources and difficulty in obtaining natural materials	Increasing transportation opportunities and population mobility, easy access to industrial construction materials and technology, new master plans regulated by changing administrative status		

5.2.5.2 At Building Scale

The most critical threats for the Bağpınar vernacular buildings are related to translated human needs and desires. Housing units, as mentioned in the second chapter, are created based on the user's everyday habits, production, social, and living practices. Therefore, losing the user or changing these practices requires transforming the housing units. Since revealing these inappropriate circumstances of the cultural heritage, housing transition is analyzed on two scales: building element system and spatial organization. This information was analyzed into three groups: changing, adding, and losing the building (Table 5.4). The natural and structural transitions affecting the building element system are;

- The shortage of building materials due to climate change and the decrease in natural resources such as stone quarries, the difficulty of obtaining natural materials, and the increase in costs
- Easy and quick access to industrialized material and its labor as a result of the enlargement of the city and changing village to a neighborhood.
- Bağpınar houses have two central structural systems: masonry and rock carving. Some were deteriorated or demolished, while others were interfered with using reinforced concrete or supports (Figure 5.66, Figure 5.67).

Table 5.4 Housing transition related with habitus (continuous at page 168)

Housing Transition		**Structural Transition**			**Habitus Transition**		
		Changing	***Adding***	***Loss***	***social***	***natural***	***locational***
On building element system	Structural System	Changings some parts of floor, exterior wall and internal subdivisions	Adding new structural components	Demolishing some part of the building due to the vandalism, abandonment, lack of constant maintenance and repair, pulling down some no need spaces	Structural strength and stability	The shortage of building materials due to climate change and the decrease in natural resources such as stone quarries, the difficulty of obtaining natural materials and the increase in its costs	Easy and quick access to industrialized material and its labor as a result of the enlargement of the city and changing village to a neighborhood
	Floor	Changing traditional masonry floor system with reinforced concreate, Changing floor finishing	Adding new floor finishing on the original one, adding isolation material, covering floors with new ceiling		Structural strength, thermal comfort, hygiene, aesthetic, ease of maintenance		
	Exterior wall		Adding isolation material, adding cement base plaster		thermal comfort		
	Vertical Circulation	Changing masonry stairs with new system	Adding new treat finishing, constructing new stairs		Hygiene, safety, need for new floor		
	Wall Openings	Changing the wooden windows and iron bar with pvc windows, changing the dimensions of windows and doors, changing the wooden outer doors with iron ones	Adding new windows and doors to new living spaces, new openings to barns, storages and balconies		Light level, thermal comfort, air flow,		
	Roof	Changing the roof flooring with reinforced concreate	Constructing new gable or hipped roofs with tile or galvanized metal finishing		Temperature, safety, hygiene, ease of maintenance		
	Internal Subdivisions		Constructing new internal walls		Privacy, need for new spaces		
On spatial organization	Plan scheme	Making bigger or dividing some spaces	Constructing balcony, new storey, rooms	Demolish of unused spaces	need for new spaces, security, thermal comfort, aesthetic, visual comfort	Decreasing rural production based on agriculture and animal husbandry with the effects of climate change and decrease in natural resources	the shift of the workforce from the countryside to the city and the decrease in rural production due to the ease of access to the city center
	Form	Adding new floor, roof, room or changing dimensions of balcony, open and semi - open parts of the building with walls, and roofs, pull down outer toilets and demolishing some parts of the building			need for new spaces, no need for space, security, thermal comfort, aesthetic, visual comfort, structural strength		
	Function	Changing barns and its storages (especially all ground floors) with living spaces	Adding inner toilets, baths and kitchens	Demolishing outer toilets, outer barn and its storages	Need for new functions, no need for some functions,		

Housing Transition	**Structural Transition**			**Habitus Transition**		
	Changing	***Adding***	***Loss***	***social***	***natural***	***locational***
Articulation	Changed functions, inner and outer spaces, circulation systems and form transforms articulation					
Ornamentation	Aging or removal of decorative elements on exteriors, balconies and interior furnishings			Changing aesthetic perception, lack of qualified craftsman for traditional ornamentation	Difficulty in obtaining local materials	Ease of supplying new, cheap and various materials
Material	Using reinforced concrete or bricks instead of cut stones, which are the main building materials of the traditional architecture of the village, reinforced concrete and different trees instead of juniper trees as structural component, concrete screed, wood and ceramic instead of traditional wood and sal stone as flooring and PVC instead of wood in windows.			Demanding new materials that are easy to use and repair with developing technology, high cost of local material compared to industrial ones	The inability to supply the building materials (cut stone, stone chips) in the region due to declining resources or the inability to produce materials such as juniper	Obtaining different materials due to developed transportation opportunities

The authentic floor covering of the site is *sal* stone and wood. However, these materials need proper maintenance and cleaning. In order to continue to use natural materials with vernacular and traditional techniques, industrial, cheaper, easily applicable, and maintenance materials and techniques are generally preferred for floor finishing. The second alteration of the floor is building a new system with reinforced concrete. The authentic floor system with wooden beams and stone could be sensed as dirty and hard to maintain. Hence, some preferred to change the whole system or cover the ceiling with a flat material (Figure 5.68-72)(Table 5.4).

Depending on their load-bearing features, it is hard to alter exterior walls as a whole. Generally, it is preferred to add isolation material and plaster with cement base materials (Figure 5.73, Figure5.74). The masonry stairs generally continued to be used with new balusters, but in some cases, for linking the ground and upper floor from the inside, new steel, reinforced concrete, and wood (Figure 5.75, Figure 5.76).

Figure 5.66 Reinforced concreate adding to the structural system

Figure 5.67 Reinforced concreate adding to the structural system

Figure 5.68 Ceiling interventions

Figure 5.69 Ceiling interventions

Figure 5.70 Ceiling interventions

Figure 5.71 Authentic ceiling and flooring

Figure 5.72 Flooring interventions

Figure 5.73 Exterior wall interventions

Figure 5.74 Exterior wall interventions

The window and door industry created cheaper, easier-to-maintain, and mass-productions with new technologies. These provide more light, sound, and heat insulation with uncomplicated switching (Figure 5.77). Therefore, the traditional wooden windows with two frames changed to industrial ones, and the iron bars were commonly demolished.

Due to the changes in the plan organization and function of the spaces, new wall openings are added. For example, with the cancellation of the husbandry in the village, some of the barns in the buildings were changed to kitchens or living rooms, so the smaller ground-floor windows were enlarged, and new doors were added. Adding balconies or dividing houses according to the inherence situations created a need for new doors.

Figure 5.75 New addition stairs

Figure 5.76 New addition stairs

Figure 5.77 Changed window frames

Changing the roofs is the most popular and critical intervention that prevents the perception of the authentic fabric of the architecture and settlement (Figure 5.78, 5.79). The traditional earthen roof structure requires constant maintenance, like pressing the soil, repairing, and shoveling the snow in winter. This roof system carries wooden beams and *sal* stones, which also require maintenance. Hence, the locals prefer the hipped roof system with tile covering. This roof selection causes us to forget authentic roof construction knowledge and damages the cubic spirit of the Bağpınar. Internal subdivisions generally have minor alterations like plastering. In some cases, the plan organization was changed, and new interval walls were added. For covering wooden beams and solving dust problems coming from the ceiling, it is observed that some users constructed suspended floor systems.

Figure 5.78 New addition roof systems

Figure 5.79 New addition pitched roof systems

The consequences of the transition on the spatial organization are examined in four sub-titles: plan scheme, form, function, and articulation (Table 5.4). The transition results in this scale generally depend on the need for a new space, functions, or organization and unnecessary spaces and functions. Because of the transformed practices and lifestyle, the kitchen's need for technology and furnishing is transformed. This caused the application of water and electricity infrastructure to the building and the demolition of the traditional organizations. This occurred in the creation of new spaces for kitchens (Figure 5.81).

Figure 5.80 Living rooms

Figure 5.81 Kitchen interventions

Figure 5.82 Function changing of the barn and storages

Figure 5.83 Function changing of the barn and storages

Similarly, older toilets were in the courtyard of the houses, and baths were inside the niches of the living rooms. It is improper for today's comfort conditions, and users built new wet spaces by demolishing or adapting and reusing older ones (Figure 5.84). As mentioned above, husbandry has been forbidden in the Bağpınar housing zones; consequently, the barn and hayloft spaces have been abandoned, demolished, or new functions added (Figure 5.82, Figure 5.83). Not producing wheat products with seten or soku and grapes with şırahane has resulted in the demolition of these spaces. Near these reasons and results, the user's personal needs, like living with more or fewer people, created the adding and demolishing activities by altering the form and plan scheme of the buildings. Changed functions, inner and outer spaces circulation systems, and form and plan schemes transformed the articulation accordingly perception and spirit of vernacular architecture of the Bağpınar (Figure 5.82, Figure 5.83).

Figure 5.84 New addition wet spaces

Aging or removal of decorative elements on exteriors, balconies, and interior furnishings are outcomes of changed aesthetic perception, lack of qualified craftsmen for traditional ornamentation, preferring modern furniture instead of the niches, hearths, *tandır*, *cağ, seki, or şerbetlik* (Figure 5.85-87).

Figure 5.85 Changed furniture usage

The material transformation in the Bağpınar explained in the former paragraphs, and the reasons can be listed as:

- Demanding new materials that are easy to use and repair with developing technology,
- high cost of local materials compared to industrial ones
- The inability to supply the building materials (cut stone, stone chips) in the region due to declining resources or the inability to produce materials such as juniper
- Obtaining different materials due to developed transportation opportunities easily
- Starting to disappear from craftsmanship and knowledge of vernacular techniques.

Figure 5.86 Balcony additions

Figure 5.87 Balcony additions

5.3 Assessment of the Vulnerability

As RUHET suggested, the application stage started with choosing an expert to decide the weight of criteria, sub-criteria, and indicators and the value of the indicators. After obtaining the required permission from the ethical committee of AGU, with the date 03.02.2023, a Google Forms document was prepared for the realizing pairwise comparison of the criteria and indicators (Figure A.1, Figure A.2). Before sending the form via mail, a meeting was organized to explain the AHP method and decision tree to the experts. Following this meeting, the document was sent to the experts via e-mail, and they finalized the pairwise comparison remotely.

The results of the selections were digitalized with Microsoft Excel (Table B.3-11). Each comparison decision group of experts was calculated, and the decision matrix was

prepared individually. Due to the calculated consistency ratio, experts were consulted again. After revising the choices according to the appropriate consistency ratio, the required weights are determined (Table B.1, Table B.2). The decision tree was finalized according to the Aggregation of Individual Priorities of the AHP method. All expert results were derived, indicating the arithmetic average.

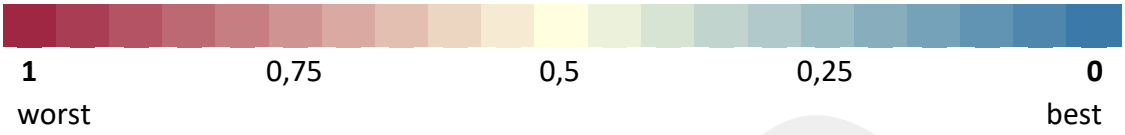


Figure 5.88 The color scale of the utility scores of susceptibility

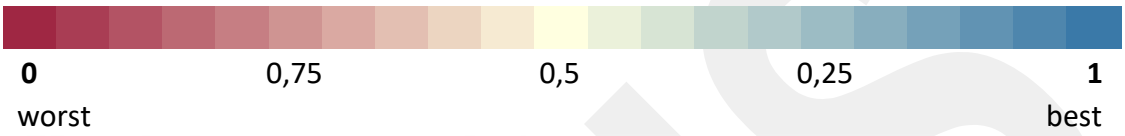


Figure 5.89 The color scale of the utility scores of coping and adaptive capacity

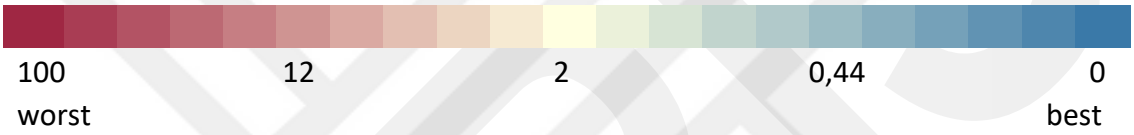


Figure 5.90 The color scale of the overall utility scores of vulnerability

The RUHET offers the direct assessment method depending on the discrete assessment options of the indicators. The value options of the indicators were decided with a small group of weight experts. The list was discussed together, and value alternatives of the indicator were also finalized. According to the calculations and assessment results susceptibility, capacity and vulnerability should be interpreted according to the given ranges (Figure 5.88-90). While susceptibility, coping and adaptive capacity range is between 0-1, vulnerability range is calculated between 0-100 due to the *vulnerability= susceptibility/ (coping capacity x adaptive capacity)* (Figure 5.90).

5.3.1 Selection of the Case Building and Application of the Assessment

Near the uncountable fields/gardens, grasslands, squares, and streets, Bağpınar has 5 fountains, a cemetery, 2 main bridges, an oven, 9 dovecotes, 5 separate hayloft/barn, a mosque, a church, a school, a shop, and 168 housing units which are in the assessable situation. It can understand the settlement consists of almost all housing units. There are 131 residences in the northern geçe and 37 in the southern geçe. This application aims to represent examples of the rural landscape as a heritage vulnerability assessment; therefore, some heritage properties belong to the different functions listed in Figure 5.12 selected to assess all buildings of the village.

Within the scope of the thesis, the following criteria have been considered in selecting traditional residential structures to enable commentary on Bağpınar's rural architectural heritage (Table 5.5). The building should include;

- Accessibility for thorough interior and exterior examinations,
- Various levels of preservation among the structures,
- Diverse usage status of the buildings,
- Differing cultural heritage registration status,
- Diversity in architectural plan types based on the given typology,
- Differences in building blocks concerning features such as plot, location, and slope for examining different vulnerabilities.

Table 5.5 The features of the selected dwellings

No	Inventory number	Plot/block number	Location		State of registration	Usage status		Parcel type		
			north	south		using	abandon	small	medium	large
1	S1	15746/2		X			X	X		
2	S2	15743/23		X		X		X		
3	S3	15743/28		X		X			X	
4	S4	15743/30		X		X			X	
5	S5	15743/37		X		X			X	
6	S6	15743/48		X			X			
7	S7	15743/19		X			X	X		
8	S8	15743/26		X			X		X	
9	S9	15744/1		X		X			X	
10	N1	15740/37	X			X				X
11	N2	15740/21	X				X	X		
12	N3	15740/22	X				X		X	
13	N4	15757/8-9	X		Group 2	X			X	
14	N5	15740/25	X			X			X	
15	N6	15761/1	X			X				X
16	N7	15740/4	X			X				X
17	N8	15740/7	X			X		X		
18	N9	15751/5	X				X		X	
19	N10	15751/6	X			X			X	
20	N11	15752/2	X			X				X
21	N12	15752/7	X		Group 2		X			X
22	N13	15754/1	X			X			X	
23	N14	15764/4	X			X			X	
24	N15	15764/6	X			X				X
25	N16	15771/3	X			X		X		
26	N17	15771/13	X			X		X		
27	N18	15771/15	X			X			X	
28	N19	15771/16	X			X				X
29	N20	15772/3	X		Group 2		X		X	
30	N21	15773/1	X			X			X	
31	N22	15773/4-5	X				X			X

Accordingly, within the scope of the study, 21 from the northern geçe and 6 from the southern geçe sample houses were selected (Table 5.6). The vulnerability assessment survey studies started with the filling out vulnerability inventory cards and continued with their digitalization and interpretation via Microsoft Excel calculations and graphs (Table 5.6-8) .

5.3.2 Assessment of the Susceptibility

Table 5.6 Assessment tree of the susceptibility with weight and utility value

susceptibilty							
code	**criteria**	**w. (%)**	**code**	**indicators**	**w. (%)**	**ranking criteria**	**utility value**
SC.1	usage	49	**SI.1**	user status	41	abandoned non-local user local user	1 0.5 0
			SI.2	using period	21	abandoned seasonal permanent	1 0.5 0
			SI.3	using function	38	abandoned changed function original function	1 0.5 0
SC.2	sustainability of the architecture	30	**SI.4**	compensation to today	33	Space can fulfill the needs of todays comfort conditions. Space can fulfill the needs of today partially. Space can not fulfill the needs of today.	1 0.5 0
			SI.5	ease of maintenance	28	very bad poor moderate satisfactory very good	1 0,75 0,5 0,25 0
			SI.6	usage status	39	Space is not used. Space is used for a new function. Space has been used for its original function.	1 0.5 0
SC.3	current situation	21	**SI.7**	deteriorations	-	Deterioriations cause to loss of the traditional form and facade organizations. Deterioriations cause the alteration of the form and facade Deteriorations cause the alteration of spatial organization. Deteriorations affect the system of the element Deteriorations affect the material of the element	1 0.75 0.5 0.25 0
			SI.8	inappropriate intervention	-	Interventions cause to loss of the traditional form and facade organizations. Interventions cause the alteration of the form and facade Interventions cause the alteration of spatial organization. Interventions affect the system of the element Interventions affect the material of the element	1 0.75 0.5 0.25 0

Susceptibility assessments are finalized according to the Table 5.7. The usage situation has the most critical effects on the susceptibility assessment, with 49% rate.

Humans are responsible for the maintenance and repair of cultural heritage; in other words, the user status of cultural heritage is decided by experts to be the most effective indicator of the SC.1 sub-criteria with a 45% rate. According to the survey at the site today, the open production areas, except for buckthorn yards, continued to be used. Nevertheless, due to the changed production practices, bezihane, şırahane, seten, and soku components of the Bağpınar rural landscape as heritage are abandoned. Even if the functions and activities have been changed, the fountains and squares continue to be used. Also, the Muslim cemetery of the village is used today. Transportation elements continue to be used regularly by the locals and visitors of the Koramaz Valley and the village.

As the production spaces, the only used building is the oven (hearth), even if it is not used properly. Some of the dovecotes, barns, and haylofts are used for storage, while some of them are abandoned. The only properly used and sustained original functional socio-cultural building is the mosque. The school is abandoned, and the function has been changed to a condolence house. According to the new function, the building is used rarely. Churches on the site are abandoned too many years ago due to the absence of prayers and their locations. In addition, the only commercial building in the village was abandoned, too.

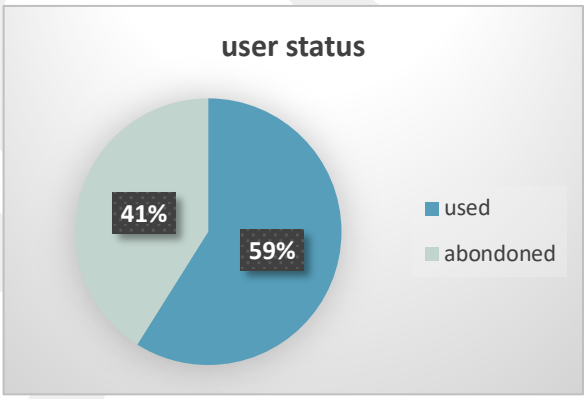


Figure 5.91 The percentages of used and abandoned units

Bağpınar village has 168 housing units except for the ruins in the urban conservation site boundaries. 131 of them are on the northern side, while 37 of them are on the southern side. 45% of the village houses are abandoned (Figure 5.91, Figure 5.92). Even if today the village has become more popular for the Kayseri inhabitants as a vineyard area and it is possible to see some house, field, or garden selling announcements, it is not documented that any nonlocal users between the selected housing units.

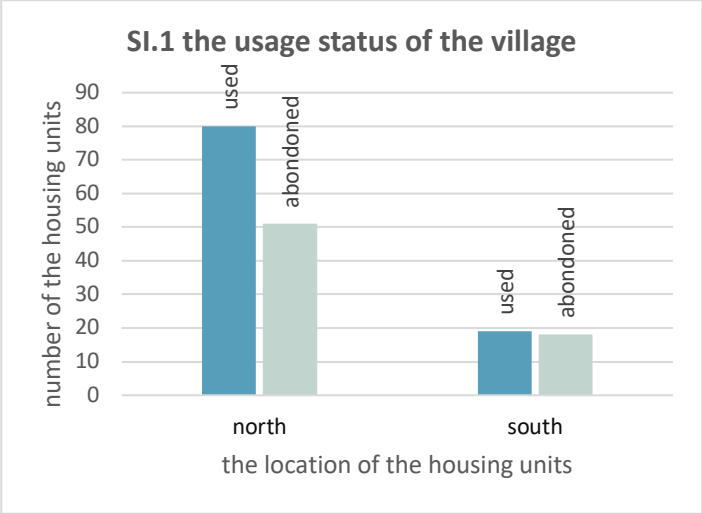


Figure 5.92 The results of the SI.1

SC.2 The sustainability of the architecture sub-criterion is determined 20% effective on the susceptibility. First of all, SI.4, the compensation of the spaces to today's conditions is decided. The heritage properties of the settlements, except the housing units, are evaluated in their own context and spaces. Then, the average, though, due to the site survey, is recorded. The dwellings are examined space by space as RUHET offered.

According to the former section about the consequences of the spaces, the results of this indicator are determined. When the spaces in the houses are examined one by one, it is figured out that wet spaces and kitchens cannot fulfill today's needs. It mainly depends on the changed technology, infrastructure opportunities, and the desire to solve all needs in the building instead of the courtyards. Production and circulation spaces can partially fulfill the needs of today's people. It is obvious that the main problem for the circulation is being uncovered. Users prefer a closed circulation for using the ground and first floor efficiently. Due to the unchanged usage habits of the living spaces, it can fulfill the needs. Only the furnishing and material usage is transited, so it has 0 value for this indicator.

The documentation of the construction system, material features, feedback from the locals, and SI.5, the ease of maintenance indicator, are evaluated. The repair and maintenance activities for the elements and components of the vernacular architecture of the Bağpınar require money and time because it should be done regularly, as well as craftsmanship and power. Therefore, the ease of maintenance indicator was decided as poor.

The usage status of the spaces is determined as 42% effective on the SC.2. The housing units are evaluated one by one and space by space. The graph is created according to the 21 housing in use. According to this evaluation, all living rooms are in use, and 24% of them have new functions. These functions can be generally bedrooms or kitchens. 28% of the kitchens are not used, while %48 of them are used by changing the function and 24% of them are in use as kitchen. The most transited utilization habits are observed for the wet spaces. Today, the outer toilets and shower spaces in the closets are not comfortable and so abandoned. Some toilets are used as secondary courtyard elements, and showers are used as niches. So the results show that 48% of these are not used, while the other 48% have changed their functions. Similar to living rooms, open spaces generally continued to be used, with 67% in original functions and 33% having new functions. Even though 91% of the production areas are in use, 86% have changed their function. Finally, 71% of the circulation areas continued to use the same, 19% have new functions, and 10% are not used.

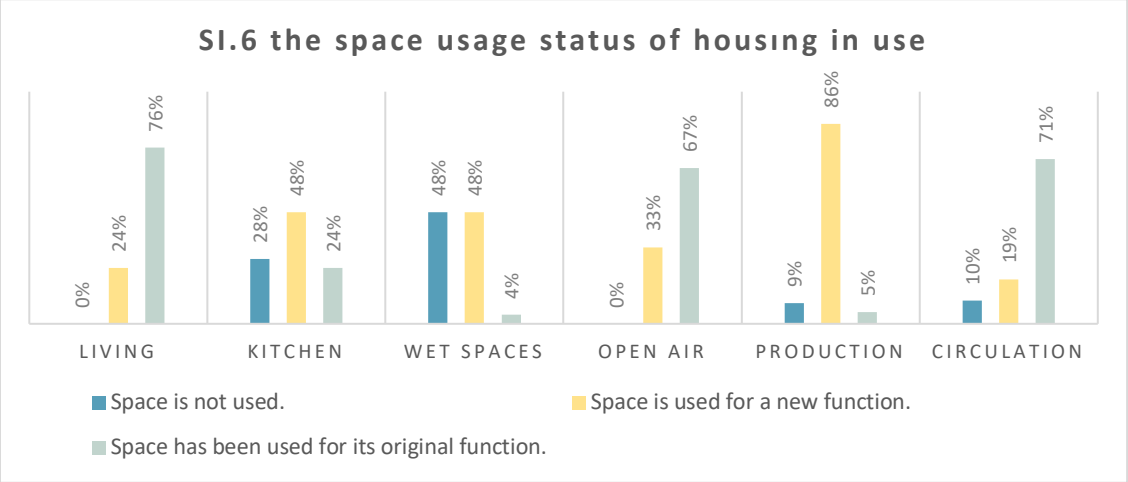


Figure 5.93 The results of the SI.6

The current situation is the final and one of the most severe sub-criteria for comprehending the requirements of the locals and the cultural heritage properties of the Bağpınar. This part was examined in two parts: deteriorations and inconvenient interventions. Then, the cumulative results are calculated regardless of the deteriorations or interventions, and the current situation is evaluated. To understand the effect of humans, abandoned and used housing are compared. It is obvious that while the used buildings have more inappropriate interventions, the abandoned ones have more deterioration (Figure 5.94, Figure 5.95).

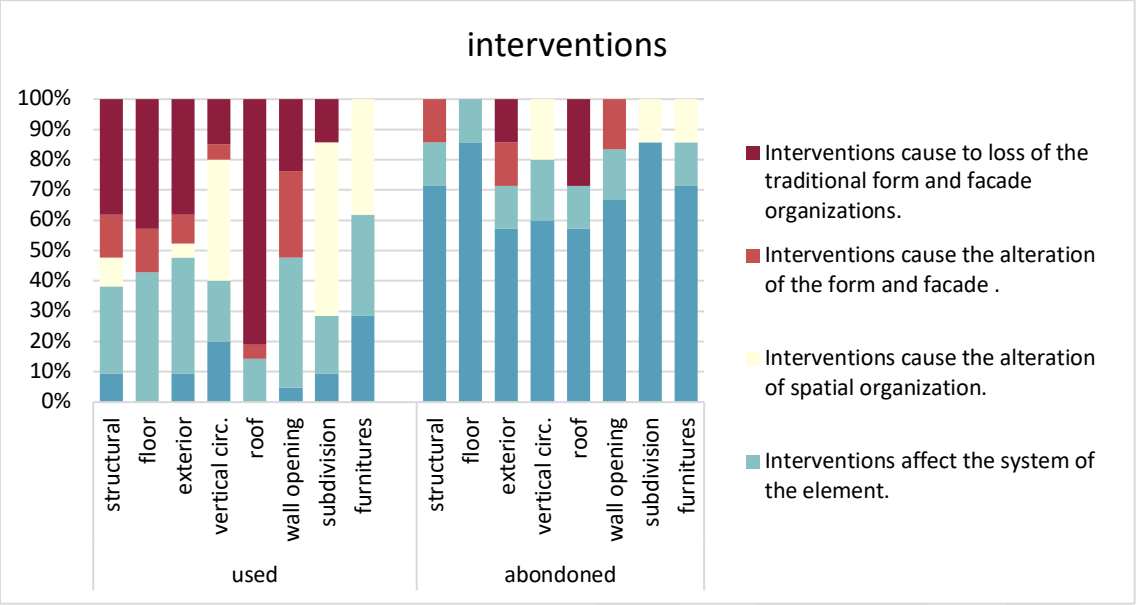


Figure 5.94 Intervention results

Depending on the former sections' surveys and documentation, these evaluations are realized. The most susceptible building element to the interventions is the roof systems. 80% of used buildings have lost traditional form and façade organizations due to these interventions. The earthen flat roofs have been replaced with inclined pitched roof systems. Secondly, floor and structural system transformations are popular, and these affect the form and façade organizations. Then, exterior walls and wall openings follow. Even in abandoned buildings, the most susceptible elements are roof systems (Figure 5.94).

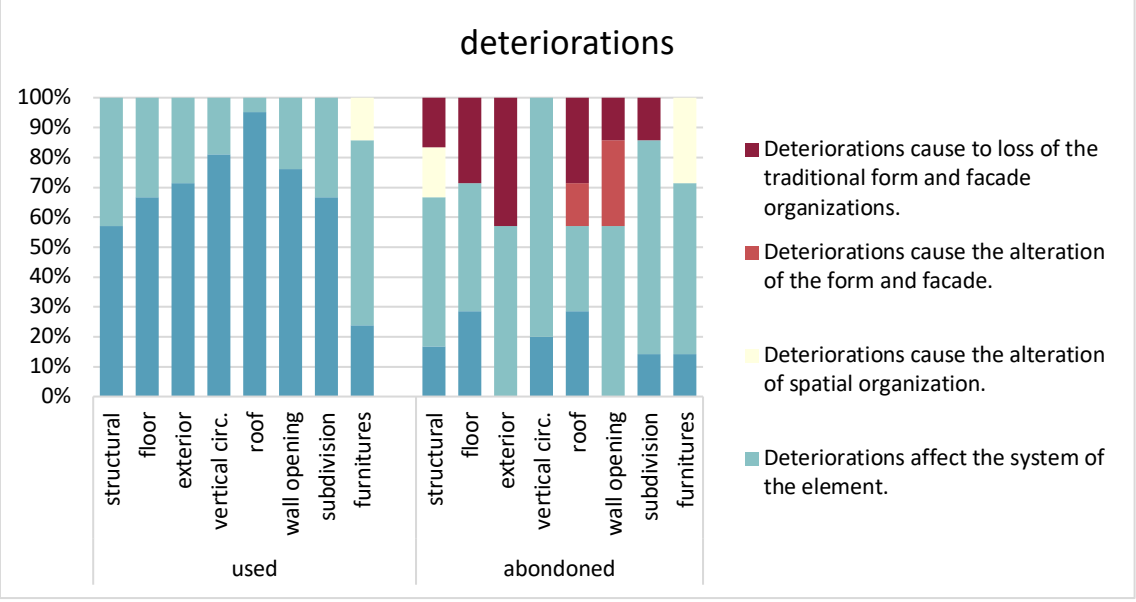


Figure 5.95 Deteriorations results

Even though the interventions are mainly seen at the used buildings, they have not serious deteriorations affecting the spatial organization depending on regular maintenance. The deterioration of the unused ones starts from the roof systems and then continues to the load-bearing walls, accordingly, wall openings and floors.

The utility values are calculated according to the cumulative result of the deteriorations and interventions. This shows again that the most susceptible building element system of the Bağpınar vernacular architecture is the roof. Then, floor, structural systems, exterior walls, wall openings, vertical circulations, internal subdivisions, and furniture are followed for the used ones. For the abandoned ones, the order from the most susceptible to the least is exterior wall, structural system, wall openings, floor system, internal subdivisions, circulations, and furniture (Figure 5.97).

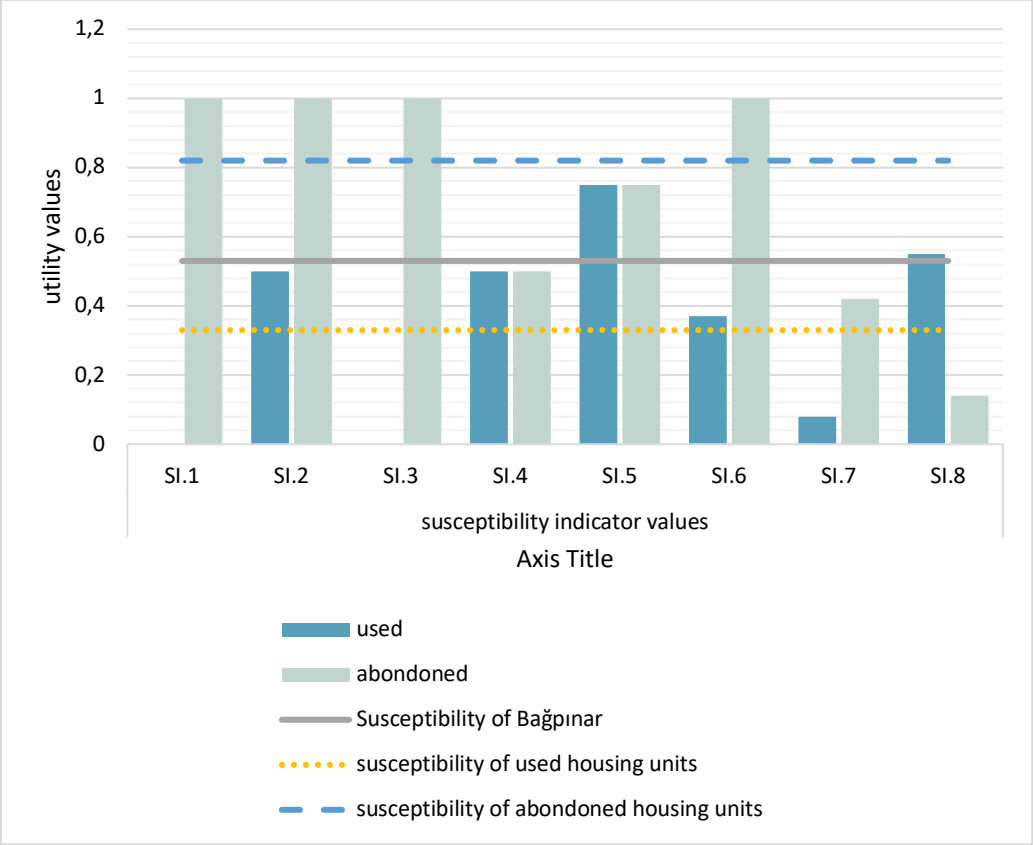


Figure 5.96 Values of the susceptibility indicators

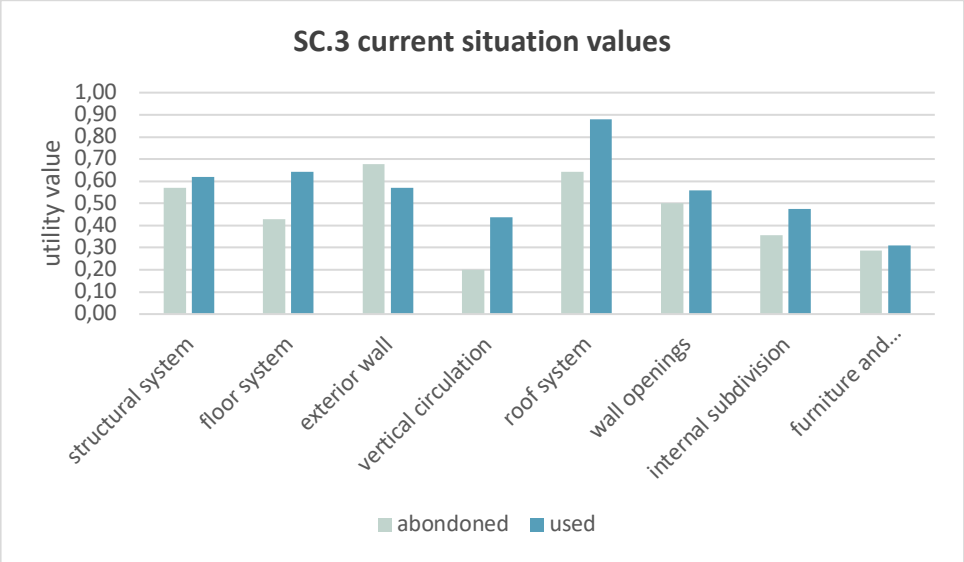


Figure 5.97 Results of the SC.3

5.3.3 Assessment of Coping Capacity

Table 5.7 Assessment tree of the coping capacity with weight and utility value (continuous in page 188 and 189)

coping capacity							
code	**criteria**	**w. (%)**	**code**	**indicators**	**w. (%)**	**ranking criteria**	**Utility value**
CC.1	awareness	30	CI.1	Awareness on threats that transformations causes	28	very good satisfactory moderate poor very bad	1 0,75 0,5 0,25 0
			CI.2	Awareness on cultural the rural landscape heritage sustainabilty	72	very good satisfactory moderate poor very bad	1 0,75 0,5 0,25 0
CC.2	institutional mitigation actions	25	CI.3	Conservation actions in the urban plan	25	The heritage is within the urban conservation plan's boundaries, and there are satisfactory actions. The heritage is within the urban conservation plan's boundaries but lacks action. The heritage is in the boundaries of interaction and transgression zone. The site was planned as a development area, and no action for conservation was taken in the urban plan. The site is not within the boundaries of any urban plan.	1 0.75 0.5 0.25 0
			CI.4	Legal status	28	The heritage is registered as 1st degree. The heritage is registered as 2nd degree. The heritage is registered as 3rd degree. The heritage is not registered individually but in the heritage site boundaries. The heritage is not registered.	1 0.85 0.70 0.45 0
			CI.5		10	Actions taken by NGOs are adequate.	1

coping capacity							
code	**crite ria**	**w. (%)**	**code**	**indicators**	**w. (%)**	**ranking criteria**	**Utility value**
				NGO's conservation actions		Actions taken by NGOs are inadequate. Any conservation action is taken by NGOs.	0.5 0
			CI.6	Cooperation with international organizations	9	The settlement is in the boundaries of a site registered by international organizations. International organizations is aware of the settlement but the support is not enough. International organizations are not aware of the site.	1 0.5 0
			CI.7	Governmental risk mitigation actions	14	Governmental risk mitigation actions protects the heritage from the risks. The government is aware of the risk but taken actions are insufficient. The government is not aware of the change risks in the rural heritage areas.	1 0.5 0
			CI.8	Rural landscape sustainability guide	7	The guide contributes to sustain rural landscape and its production. The guide is developed but insuffient for the resilience of the landscape. A guide for the sustainability of the rural landscape has not been developed.	1 0.5 0
			CI.9	Rural landscape heritage conservation guide	7	The guide contributes to conserve rural landscape as heritage. The guide is developed but insuffient for the resilience of the heritage. A Guide is not developed.	1 0.5 0
CC.3	Current laws and regulations	31	CI.10	Rural heritage conservation actions	50	Current laws and regulations are efficient Current laws and regulations are not efficient There are no laws and regulations regarding rural heritage	1 0.5 0
			CI.11	Transition risk management actions	50	Current laws and regulations are efficient Current laws and regulations are not efficient There are no laws and regulations regarding transition risk management	1 0.5 0
CC.4	Transition risk mitigation strategies/actions	14	CI.12	Risk action plan	23	The risk action plan is efficient. The risk action plan is not efficient. There is no risk action plan regarding transition.	1 0.5 0
			CI.13	Risk Management Plan Coordinator	15	Cultural heritage risk expert(s) is selected as the coordinator. Local person(s) is selected as the coordinator. There is not a coordinator.	1 0.5 0
			CI.14	Risk management plan implementation audit	14	An audit mechanism is organized by defining personnel. An audit mechanism is not organized.	1 0
			CI.15	Disaster risk management training	14	Training for transition risk in rural heritage is efficient. Training for transition risk in rural heritage is not efficient and widespread. There is no training provided for transition risk in rural heritage.	1 0.5 0

coping capacity							
code	criteria	w. (%)	code	indicators	w. (%)	ranking criteria	Utility value
			CI.16	Cooperation between heritage organizations and disaster management	10	Cooperation between heritage organizations and disaster management is efficient. Cooperation between heritage organizations and disaster management is not efficient. There is no cooperation between heritage organizations and disaster management.	1 0.5 0
			CI.17	Information and communication system	8	A system is generated for information and communication regarding risk management. There is no system for information and communication regarding risk management.	1 0
			CI.18	Financial resources and risk compensation mechanism	16	Financial resources are adequate for the transition risk mitigation. Financial resources are inadequate for the transition risk mitigation. There are no financial resources or compensation mechanisms.	1 0.5 0

Hazard awareness refers to the conscious understanding of individuals or organizations regarding the existence of a specific threat and its potential impacts. This awareness is critical in risk assessment and management because it provides essential information to comprehend the danger, take appropriate measures, and effectively manage risks. It is also fundamental for collaboration, communication, and resource mobilization among relevant stakeholders. Even cultural heritage risk studies have gained momentum in Turkey; they mainly focus on natural disasters (seismic, flood, hurricane, climate change, etc.) or human-induced hazards (vandalism, mass tourism, war, etc.). In addition, these studies generally cover historic monuments and archeological sites. This study centers on Bağpınar's rural landscape with tangible and intangible properties. There is no awareness of habitus transition effects on Bağpınar, even in governmental organizations or locals. Therefore, the understanding of hazards is decided as very bad (Table 5.8).

Table 5.8 The values of CC.1 criterion

	CC.1		
Bağpınar	CI.1	CI.2	total
	1	0,5	0,64

Bağpınar Settlement represents a live and authentic rural landscape features with tangible and intangible values. The local community has resided within these registered heritage sites for generations, spanning different centuries, and has cultivated distinct

traditional and vernacular architectural styles, landscapes, and cultural practices. While the locals were conscious of the archaeological and monumental heritage of Bağpınar, their awareness regarding the vernacular architecture, landscape, and intangible features was limited. With the beginning of the Koramaz Valley conservation plans, the perception of the area changed holistically. Koramaz Valley, where Bağpınar village is one of the villages on it, was registered in a UNESCO World Heritage Tentative List in 2020. The UNESCO preparation process has facilitated the acceleration of efforts and studies related to the area. Governmental interventions and administrative decisions have been taken, and surveys and registration works have started.

Another vital attempt to increase awareness of Bağpınar's cultural heritage is establishing Kapadokya Kültepe Koramaz History, Culture, Education, and Research Association by local historians, archeologists, and experts. They aimed to prepare the site management plan for the region and constitute a study team of experts. These developments created public opinion, and then promotion studies gained speed. The municipality focused on the region and created some public activities like announcing the valley bottom as a public walking route. The walking route, which starts from Bağpınar to Ağrınas, became strongly popular between close settlements and the city center. One of the most popular photographers in Turkey, Coskun Aral, and some local photographers were invited to the valley and villages, and a photograph archive and e-book were created. TEMA Foundation (The Turkish Foundation for Combating Soil Erosion, for Reforestation and the Protection of Natural Habitats) organizes garbage cleaning activities with other local NGOs (Figure 5.99).

Figure 5.98 Activities in the village (left: URL-1, right: Elagöz Timur)

All reputations of the site developed on natural and archeological properties and started to become a tourism destination of the Kayseri. Consequently, the vernacular life

and architecture of the Bağpınar are ignored. Due to these, the indicator of awareness of the cultural heritage for evaluating the lack of coping capacity is decided to be moderate.

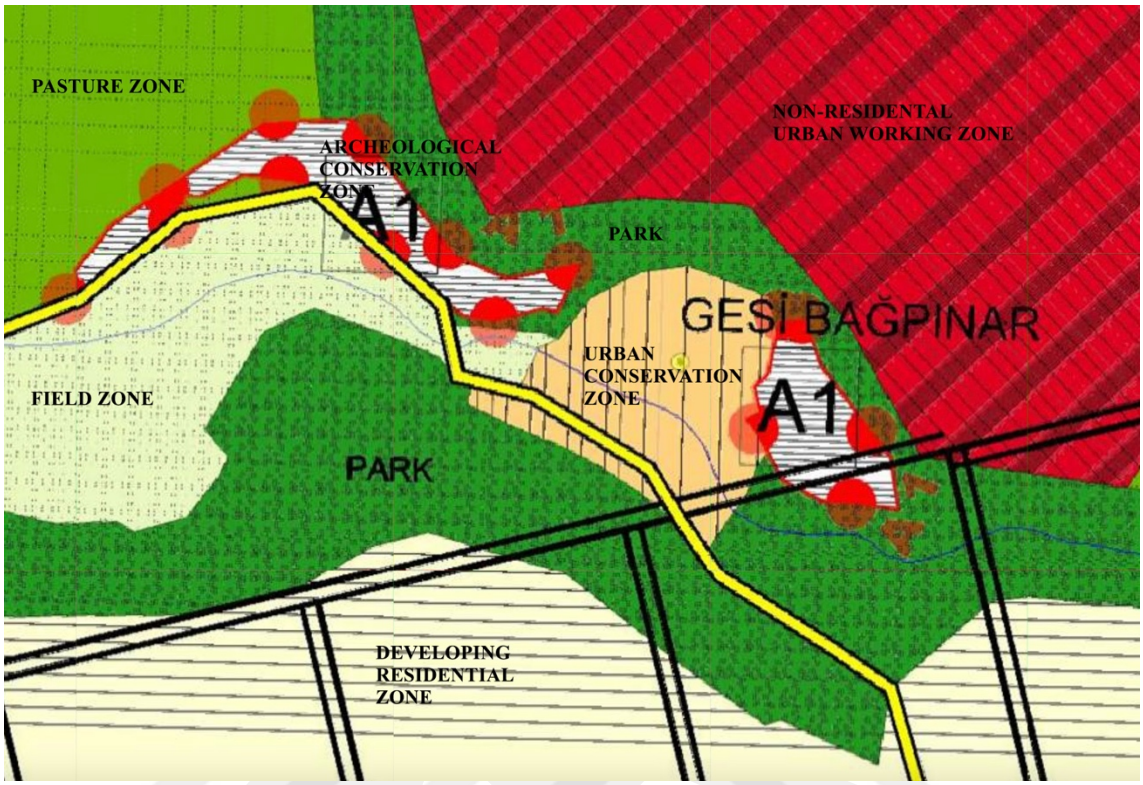


Figure 5.99 1/5000 scale urban plan (cbs.kayseri.bel.tr)

Table 5.9 The results of the CC.2

Heritage property		CC.2							
		CI.3	CI.4	CI.5	CI.6	CI.7	CI.8	CI.9	total
Open landscape elements	field/garden	1	1	1	1	1	1	1	1
	square	1	0,45	0,5	0,5	1	1	1	0,75
	fountain	1	0	0,5	0,5	1	1	1	0,62
	cemetry	1	0	0,5	0,5	1	1	1	0,62
	street	1	0,45	0,5	0,5	1	1	1	0,75
	bridge	1	0	0,5	0,5	1	1	1	0,62
Architectural environment	oven	1	0,45	0,5	0,5	1	1	1	0,75
	dovecote	1	0,45	0,5	0,5	1	1	1	0,75
	barn/hayloft	1	0,45	0,5	0,5	1	1	1	0,75
	mosque	1	0	0,5	0,5	1	1	1	0,62
	beşaretkaya	1	0	0,5	0,5	1	1	1	0,62
	school	1	0	0,5	0,5	1	1	1	0,62
	shop	1	0,45	0,5	0,5	1	1	1	0,75
	housing	1	0,42	0,5	0,5	1	1	1	0,74

The site is not within the boundaries of even an urban plan. Only the 25000 scaled master plan of the city mentioned a decision that was too generic (Figure 5.100). The urban conservation plan studies have begun, but yet Bağpınar has only “transition period building regulations.” There for all cultural heritage properties of the Bağpınar CI.3 value is 1.

Figure 5.100 Demolished house before – after

The legal status of the properties can change. As mentioned before, 8 properties were registered as Group 1, and 3 houses were registered as Group 2. Also, the archeological and urban conservation site boundaries are shown in the village map.

There is an NGO established with the name “Kültepe-Koramaz History, Culture, Education and Research Foundation (Kültepe- Koramaz Tarih, Kültür, Eğitim ve Araştırma Derneği)”. The foundation was established by the Kayseri’s famous historians, academicians, locals, and individual researchers. They aim to develop research and create awareness for the areas by contacting locals and governmental organizations. The international organization contacts started with the UNESCO Cultural Heritage List process, and studies are continuing for the passing from the tentative list to the main list.

Figure 5.101 New reinforced concrete houses are in the valley bottom

Figure 5.102 Constructed new houses

There is very limited research about the threat of transition due to habitus change in comparison with the threats of sudden natural or human-induced change. Governmental studies focus on these risks in Turkey. Hence, there are no risk mitigation actions for the aforesaid threat. Similarly, no comprehensive studies or prepared guides about natural and cultural heritage conservation exist.

As a result of these insufficient conservation actions, it is occurred that some vernacular buildings are demolished and new buildings are constructed illegally (Figure 101-103). Since there is insufficient awareness and study in Türkiye about habitus transition as a threat, the laws, regulations, and risk mitigation actions are insufficient or absent. It is obvious that the weakest coping capacity criteria are CC.3 and CC.4 (Figure 5.104).

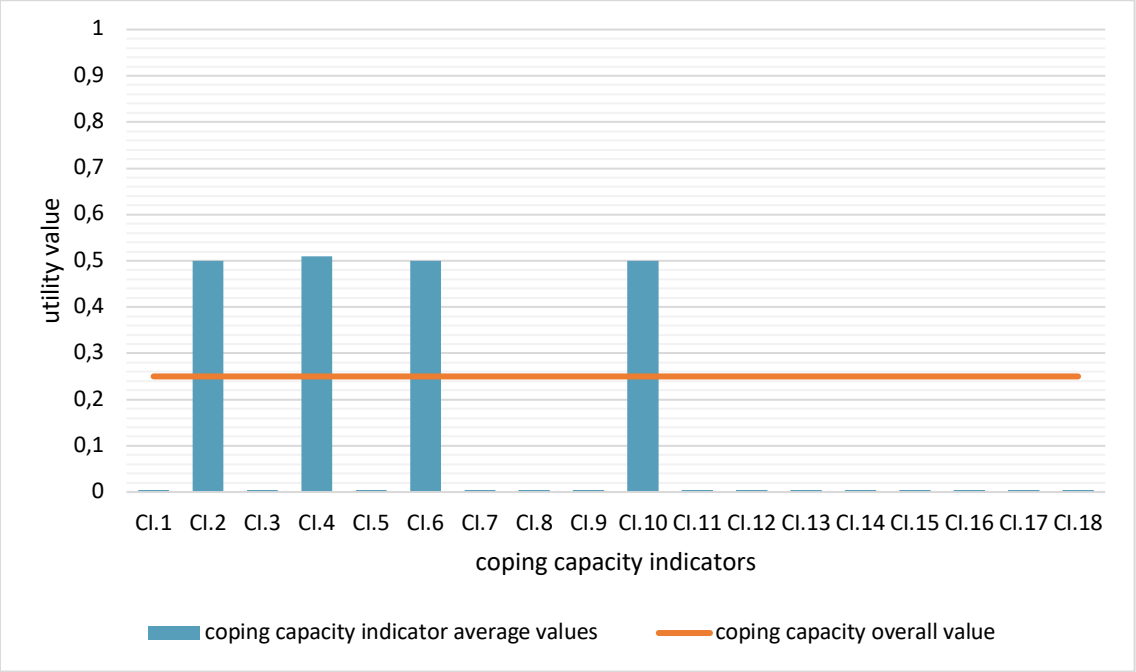


Figure 5.103 The values of the lack of coping capacity indicators

5.3.4 Assessment of Adaptive Capacity

Table 5.10 Assessment tree of the adaptive capacity with weight and utility value

adaptive capacity							
code	**criteria**	**w. (%)**	**code**	**indicators**	**w. (%)**	**ranking criteria**	**Utility value**
AC.1	state of conservation capacity	57	AI.1	Traditional construction/production knowledge	26	All traditional technics and technologies are documented and known by common. All traditional technics and technologies are known by the locals. Several technics and technologies are disappeared. Most techniques and technologies have disappeared. Traditional construction knowledge has disappeared.	1 0.85 0.5 0.15 0
			AI.2	Sustainability of vernacular/traditional material	28	All materials can produce at the site or near environment for a long period. All materials can produce at the site or near environment for a short period. Materials can be found at remote quarters. Vernacular material of traditional construction systems has disappeared.	1 0.5 0.25 0
			AI.3	Affordability of using traditional technics and technologies	12	Cheaper than modern methods Approximately similar with modern methods Reasonably expensive than modern methods Dramatically expensive than modern methods	1 0.66 0.33 0
			AI.4	Developed modern methods for conservation	13	Developed methods are sufficient for resilient heritage site. Developed methods are insufficient for the resilient heritage site.	1 0.5

adaptive capacity							
code	crite ria	w. (%)	code	indicators	w. (%)	ranking criteria	Utility value
						Any modern method is developed for conservation.	0
			AI.5	Documentation and literature studies	21	There are literature studies and documentation about the heritage. There are literature studies about the heritage. There are literature studies and documentation only about the site. There are no literature studies and documentation about the site and heritage.	1 0,66 0,33 0
AC.2	resource access	43	AI.6	infrastructure	48	Infrastructure is existent. Infrastructure is absent.	1 0
			AI.7	urban network	17	very good satisfactory moderate poor bad	1 0,75 0,5 0,25 0
			AI.8	superstructure	35	Superstructure is sufficient for the coping with the transition. Superstructure is insufficient for the coping with the transition. Superstructure is sufficient for the coping with the Superstructure is absent.	1 0.5 0

Bağpınar, even though there are some minor differences, has similar characteristics to the Koramaz Valley settlements. The widespread usage of architecture causes more resilient knowledge of construction and production systems. Consequently, finding a craftsman expert in the valley's vernacular architecture is possible today. All traditional techniques and technologies are known by the locals, and they can repair their houses with this know-how.

The second critical issue for the sustainable conservation of the building is vernacular/traditional material supply. Vernacular architecture is created with local materials due to their quick, easy, and affordable reachable features. As explained in the Bağpınar construction system, the load-bearing masonry walls and floors consist of respectively different types of stones, wood, and soil. Additionally, iron and gypsum are used as joining, ornamentation, and furnishing material. For the assessment of the I.11 Sustainability of the vernacular/traditional material of the Bağpınar, the percentages of the materials according to the existence in the buildings are determined. The percentage of the materials are stone 50%, wood 30%, soil %15 and iron %5. After the evaluation of the materials individually and calculating the total value according to their weight, the value of the indicator AI.11 for the Bağpınar was found to be 0,66 (Table 5.11).

Table 5.11 The result of the CI.11

Bağpınar	AI.11				
	Stone (50%)	Wood (30%)	Soil(15%)	Iron (5%)	total
	0,25	0,5	0	0,5	0,3

Another important indicator is the affordability of the materials and systems. Generally, the cost of the material is determined according to the reserve, the ease of production, and transportation. Nowadays, mass-production materials can be cheaper than natural ones, and this causes the tendency to use non-local materials. For the Bağpınar example, the materials are reasonably expensive than modern methods. Unfortunately, in these circumstances the materials, any modern method is developed for the conservation. Bağpınar has a detailed site survey and documentation. However, some Kayseri and Koramaz Valley literature studies mention the Bağpınar too (Cömert, 2008; Çorapçıoğlu et al., 2008; İmamoğlu, 2010; Kayseri Metropolitan Municipality, 2020). There are very limited documentation studies which are restricted to registered ones.

Bağpınar has water, electricity, telecommunication, sewage, and waste management systems. Heating requirements are solved with traditional systems. Especially after the acceptance of Turkish Act No.2863 on the Conservation of Cultural and Natural Heritage, the village became a neighborhood of the central district, Melikgazi Municipality. Because of this development, the roads are repaired, and the connection with the city is strengthened with bus lines. There are no primary schools and shopping opportunities as the superstructure. However, family doctors came from the city center regularly. Even if they are insufficient for coping with the transition, there are several socio-cultural activities and job opportunities (Table 5.12).

Table 5.12 The results of the AC.2

Bağpınar	AC.2			
	CI.15	CI.16	CI.17	total
	0,17	0,25	0,7	0,37

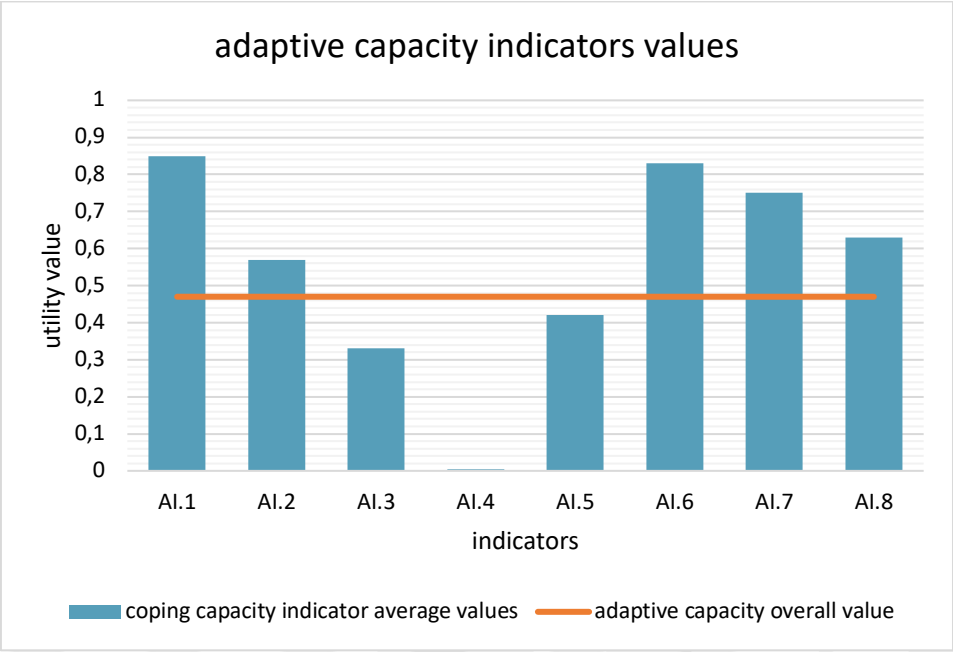


Figure 5.104 Adaptive capacity indicators value comparison

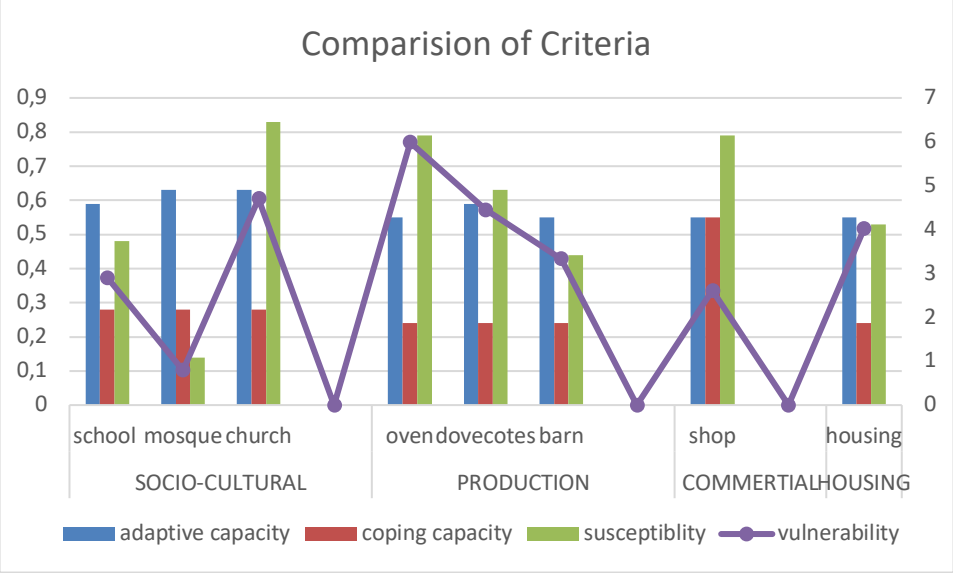


Figure 5.105 Comparison of the built environment properties

5.4 Chapter Review

Due to the results of the Bağpınar vulnerability criteria assessment in transition, two approaches can be developed. One is to start risk management for sustainable rural heritage from the heritage properties' overall vulnerabilities by sorting and prioritizing the urgency of the conservation (Table B.15). Another one is establishing a sustainable management action plan according to the criteria and indicators. According to the assessments of the coping and adaptive capacities of Bağpınar, the actions can be exemplified as;

- The transition should be accepted as a threat, its consequences should be researched, and measures should be taken.
- Together with registering as a historical urban site, Bağpınar should be included in the urban plan by considering its status.
- Institutional mitigation actions should be organized for the architecture and landscape areas with the leading guides.
- Even though the rules determine some conservation frameworks, a special definition, and actions should be determined for rural heritage.
- The weakest part of the
- For the site's adaptive capacity, first, the affordability of the vernacular systems should be provided with some projects, support, and research. Other indicators should then be supported to improve adaptivity.
- The superstructure should be developed to ensure its continuity of usage.
- Even though Bağpınar registered as an urban site, the individual registration process of the built environment should continue, and the other properties of the landscapes, like natural and archeological ones, should be considered as heritage.

For the decreasing susceptibility, the conservation actions can be summarized as:

- One of the most important susceptibilities of the Bağpınar is its usage. The authorities should develop strategies to prevent abandonment or seasonal usage.
- The complicated, inconvenient need for regular repair of the vernacular building systems of the Bağpınar should be replaced with more convenient systems without harming cultural heritage values.

- The changing needs due to the changing practices require new spaces for organizations, and responsible organizations should manage these needs.
- It is obvious that the most susceptible spaces are kitchens, production, and wet spaces. New organizations should be studied for local usage.
- The roof system is needed as the most urgent management strategy, in addition to the floor and structural systems.

Chapter 6

Conclusions and Future Prospects

6.1 Conclusions

Rural architecture is produced not by an architect but by the owner or locals as cumulative efforts, using local (vernacular) and traditional methods based on the climatic and topographic conditions of the natural environment, regional materials, and technologies, and primarily according to the functional concerns of its users. Rural areas establishing organic relationships with the natural environment and landscape where they are built are constructed by considering the daily practices of ordinary individuals who are the users. The Industrial Revolution and the resulting decrease in population from rural areas, coupled with industrialization in agriculture, have led to radical changes in rural landscape areas. While rural areas experiencing population loss are disappearing, newly created rural areas have also lost their local and traditional features due to the impact of industrialization. After these radical changes and losses, discussions about the importance of regional rural architecture have begun. Historical rural architectural areas and their landscape areas and cultural features started to be defined as cultural landscapes and were added to the UNESCO World Heritage Convention in 1992.

Nevertheless, various definitions such as local/traditional architectural heritage, rural architectural heritage, cultural landscape, and rural landscape continued to be used in studies. In 2013, the ICOMOS Türkiye National Committee defined traditional architectural heritage as "Traditional structures, groups of structures, and settlements that reflect local identity with local material and techniques, which are rapidly losing their diversity in a world where technology and communication opportunities are developing." Vernacular architecture, encompassing not only residences but all rural structures, is built to meet the specific needs reflecting the cultural values, socio-economics, and lifestyles of the society in which it originates (Oliver, 2006, p.30). Preserving these areas

representing the traditions and lifestyles of communities requires a different approach than monumental structures to identify the necessary cultural heritage values. It is essential to identify and preserve the spirit of the place formed from interaction with humans for the sustainable conservation of the values of historical rural settlements that interacted organically with humans and the environment during their periods of use. In our country, many rural or traditional architectural heritage areas are listed on the UNESCO World Heritage and Temporary lists. These areas, reflecting our traditional production, consumption, and lifestyle, our relationship with the natural environment, and intangible values, i.e., our habitus, are under threats such as deterioration, extinction, and homogenization. These structures and settlements, produced interactively with users, away from uniformity like the cities or rural areas of the modern world, are primarily threatened by user-induced changes influenced by daily life practices.

Sustainability approaches should indicate the capability of individuals, communities, societies, and cultures to adapt and thrive in the presence of evolving circumstances and constantly changing surroundings. The process entails fostering the capacity to sustain advancement regardless of different manifestations of alteration, be it gradual or abrupt, expected or unexpected. This study covers research on how rural heritage is affected and will be affected by changes in rural habitus due to parameters of rural vulnerability at a broader level. It aims to assess sensitivity to these hazards and manage transformation without preventing change but by conserving the spirit of heritage. In this approach, finding vulnerabilities in the system and acting to remove them is severe. Therefore, the RUHET model is generated to determine the vulnerabilities in the rural landscape's settlement, properties, and building element scale as heritage against the transition.

Five leading research questions were answered in four stages to realize the purpose of the thesis. One of the unique discussions and contributions to the cultural heritage field is about the habitus and rural heritage by answering the question, *"How can the habitus transition cause risks to the cultural heritage value of the rural heritage?".* The thesis underscores the intricate relationship between rural landscapes, local social practices, and environmental dynamics, noting the challenges these landscapes face in preserving their diverse cultural and natural heritage. Given the inadequacy of existing measures and management strategies, it highlights the urgency of implementing protective measures to safeguard this invaluable legacy.

The rural heritage, intricately linked to local communities' societal structure and daily habits, faces significant challenges in preserving its diverse cultural and natural heritage, particularly from alterations or disappearances. This highlights the urgent need for protective measures to safeguard this invaluable heritage, as insufficient measures and an undefined management strategy suggest an unavoidable loss of rural cultural heritage amidst changing natural settings, constructions, and socio-cultural aspects. Habitus, which gradually forms and becomes deeply ingrained in history, adjusts to evolving changes in the constructed environment, potentially leading to its complete eradication and disrupting the connection between individuals and their surroundings. In a developing world where change is inevitable, solutions that uphold the equilibrium between culture and space must be devised for heritage sites. As dynamic heritage sites, rural landscape areas require comprehensive management strategies that address new physical, cultural, and socio-economic requirements. Adaptability and vulnerability reduction make the resilience approach suitable for managing rural landscapes as heritage in transition.

Chapter 3 of the thesis explores definitions of sustainability, resilience, and risk in the literature, along with vulnerability-based sub-indicators, and asks, "*How can rural landscapes as heritage be conserved as living and dynamic sites?*". It also examines methods for calculating sustainability criteria and determines vulnerability parameters and evaluation methods for creating sustainable rural heritage amid transition. Therefore, the chapter also answers, *"How can MCDM methods be integrated into cultural heritage?".* Understanding the nature and characteristics of specific threats is crucial for developing a suitable protection model against risks arising from changes. This involves analyzing potential impacts, vulnerabilities, and patterns associated with evolving risks. Sustainability and resilience approaches are discussed together to develop a model for rural heritage conservation in transition, aiming to foster adaptive capabilities and generate opportunities. The resilient approach is precious in addressing unpredictable and abrupt changes, ensuring the sustainability of heritage sites. As a complex system, rural heritage presents challenges in decision-making, which multi-criteria decision-making (MCDM) methods address by providing structured approaches to evaluating and prioritizing alternative courses of action based on multiple criteria or objectives. Reassessing sustainability and resilience concepts helps identify indicators of vulnerabilities due to habitus transition in rural heritage, managing uncertainty and

transition through enhanced vulnerability, susceptibility control, and coping and adaptive capacity fostering. The thesis accepts vulnerability as susceptibility, coping, and adaptive capacity and utilizes MCDM methods for their assessment.

A comprehensive understanding of the nature and characteristics of the specific threats is crucial for developing a robust protection model against risks arising from changes. This involves the examination of potential impacts, vulnerabilities, and patterns associated with evolving risks while also considering the broader environmental context in which these risks occur. By gaining insights into the underlying factors driving these risks and their potential consequences, it becomes possible to identify and implement appropriate measures to mitigate and manage the challenges they present. The discussion intertwines sustainability and resilience approaches to formulate a model for conserving rural heritage during the transition. While sustainability focuses on establishing, evaluating, and upholding adaptive capacity, development involves establishing, evaluating, and sustaining opportunities. In light of the uncertain sustainability challenges in today's world, the resilient approach has emerged as a means to adapt to unpredictable and abrupt changes, ensuring the sustainability of heritage sites. Rural heritage, characterized by interconnected components and emergent behaviors, presents complex decision-making challenges. Multi-criteria decision-making (MCDM) methods provide a structured approach to evaluate and prioritize alternative courses of action based on multiple objectives. These methods offer decision support tools for analyzing the dynamics of complex systems and exploring various scenarios and potential outcomes. By reassessing the concepts of sustainability and resilience, it becomes possible to identify indicators of vulnerabilities resulting from habitus transition in rural heritage. This aids in managing uncertainty and transition by enhancing vulnerability, controlling susceptibility, and fostering coping and adaptive capacity to handle unforeseen shocks. Consequently, the thesis embraces vulnerability as susceptibility, coping, and adaptive capacity, utilizing MCDM methods for their assessment.

The RUHET model was created for the answer: "*How can the vulnerability of the rural heritage under the habitus transition be assessed for leading heritage risk management?*". The transition alters users' daily and social practices, impacting tangible and intangible heritage elements. This habitus shift significantly affects rural landscapes

due to their traditional nature. Rural areas are particularly vulnerable to such transitions, with human activities directly impacting cultural heritage. Enhanced sustainability strategies, incorporating resilience, are crucial to mitigate risks. Utilizing MCDM methods, vulnerability assessment informs management strategies for sustainable heritage preservation by examination of the susceptibility, coping, and adaptive capacity. Effectively managing diverse user interpretations is critical to addressing the primary risk facing rural heritage. Sustainable conservation involves managing change while preserving core values, emphasizing the need for rural resilience strategies to maintain vitality.

The steps for utilizing the RUHET model are outlined as follows:

A. Selecting the application site and executor: The model targets rural landscapes as heritage, preferably those with ongoing conservation efforts. An executor, knowledgeable in cultural heritage conservation and architecture, oversees the process individually or as part of a group.

B. Documenting the selected cultural heritage area, its values, and habitus: Documentation focuses on habitus-related vulnerabilities, examining vernacular architecture, social practices, and intangible heritage aspects.

C. Analyzing transition threats to the cultural heritage value: This stage involves analyzing the impact of habitus transition on the settlement and buildings, considering social, natural, and locational factors.

D. Assessing the vulnerabilities: Vulnerability assessment uses Multi-Criteria Decision Making (MCDM) methods involving expert selection, weight decisions, pairwise comparisons, and data analysis.

E. Developing resilience strategies: Results from vulnerability assessment guide the development of strategies to enhance sustainability, decrease susceptibilities, and improve the coping and adaptive capacity of the heritage properties.

The model is checked for revealing the opportunities, limitations, deficiencies, and difficulties by applying Bağpınar, Kayseri settlement. It examined the practicality of the RUHET model and presented a case study to illustrate its adaptation to different contexts. It begins with selecting an executor and a case area, focusing on Bağpınar Settlement in

Kayseri. Understanding the site's social, natural, and built environment is crucial for exploring habitus changes and their impact on cultural heritage. The vulnerability assessment follows hazard exploration and identification of cultural heritage features, offering alternative methods tailored to the Bağpınar case. Sustainability strategies are discussed to manage habitus transition, reduce susceptibility, and raise capacity.

This thesis emphasizes the importance of creating sustainable rural heritage areas not only against natural factors over the years but also against threats arising from changing habitus, which are human-induced. A model has been developed in this regard. It is suggested that the inevitable change demands in heritage areas can be managed with the same dynamic and comprehensive conservation approach.

6.1.1 Suggestions for the Sustainable Rural Heritage Against Transition

The RUHET (Sustainability of Rural Heritage in Transition) model provides a sustainable conservation approach to transforming rural heritage. Achieving sustainability necessitates embracing the dynamic notion of resilient systems. Integrating resilience into sustainability or vice versa, a comprehensive and future-oriented perspective is pr. The model explicitly addresses vulnerabilities arising from habitus transition to foster sustainability in rural landscapes. Vulnerability is approached as a forward-looking concept, considering the likelihood of harm, loss, and disruption. Ultimately, the model evaluates three critical criteria (susceptibility, coping, and adaptive capacity) to interpret vulnerability in rural heritage amid habitus transition risks. With the goal of sustainable rural heritage during the transition, the model aims to decrease susceptibility while enhancing coping and adaptive capacity.

Firstly, the study suggests reducing the susceptibility of heritage sites through these suggestions;

SC.1 Usage Status: Rural landscapes, crafted by human endeavors in harmony with nature, are vulnerable to alterations in traditional local practices. Such changes can jeopardize the natural and architectural aspects of rural heritage and its intangible elements, including sociocultural structures, ecology, and biological diversity of the area. Therefore, the authorities should control the local user movements at the rural heritage site by managing the site's ecological, economic, and social features.

SC.2 Sustainability of the Architecture: The constructed surroundings must fulfill not only the social and psychological needs but also the biological and physiological requirements of the inhabitants. Hence, the physical integrity of the spatial organization and functions of rural heritages should be integrated into the changed practices of the habitus by conserving the heritage.

SC.3 Current Situation: Any modification or alterations to the original system of building components resulting from decay or interventions can affect the heritage. These deteriorations can not be accepted for the sustainability of the cultural heritage, so the control and conservation of these susceptibilities are critical. According to the unique sensitivities of the current situation of the heritage site, conservation approaches should be developed.

RUHET aims to manage and adapt to enhance the heritage's capacity to withstand and overcome hazards.

CC.1 Awareness: Conservation initiatives commence by increasing awareness of heritage and revealing its significance, and risk assessments commence by identifying threats and proceeding with their mitigation. Coping with the risks and vulnerabilities should start with integrating locals and stakeholders. Activities should be organized to raise awareness about the site's habitus transition threat and cultural heritage values.

CC.2 Conservation Actions: Governments are primarily accountable institutions for preserving cultural heritage and play a crucial role. By enacting laws and regulations, they possess the authority to establish guidelines and formulate conservation strategies. The urban plans should be revised considering these areas, and conservation actions should be taken. To protect heritage with laws and regulations, they should be appropriately registered. In addition, cooperation with the stakeholders, NGOs, international organizations, locals, and governments should be provided. The transition should be accepted as a hazard, and Risk mitigation action should be enlarged. As a result of these actions, rural landscape sustainability and rural heritage conservation guides should be developed.

CC.3 Current Laws and Regulations: Government authorities hold a significant responsibility in the conservation of cultural heritage through the implementation of laws and regulations, which have the potential to set guidelines and structure conservation

strategies. Only with the laws can definite conservation actions be established so governments are in charge of developing these.

CC.4 Institutional Risk Mitigation Actions: Like conservation efforts, risk management actions are equally crucial for bolstering the resilience of rural heritage. Across various disciplines, risk assessments necessitate implementing mitigation measures to regulate and sustain resilience effectively. To handle the devastating results of habitus transition in the rural heritage, a coordinator should develop and manage a comprehensive risk action plan. An audit should control this process to sustain the process properly. Training should be organized to mitigate these actions with the active participation of the locals and stakeholders. The process needs information and communication systems for the administration of the plan. In addition, financial resources are an inseparable part of the mitigation, and governments should create a risk compensation mechanism.

AC.1 State of Conservation: The initial goal of preservation is to ensure the survival of resources for adapting to new situations. This criterion assesses the physical adaptability of the heritage based on the values of five indicators and offers a rise in adaptability. Traditional construction knowledge is a critical issue for conserving rural architecture, so activities and education should be organized to disseminate knowledge of construction systems. Traditional material resources should be protected, and the authorities should provide them for restoration activities. These traditional technologies and materials should be more affordable than the new ones, so the locals should be supported financially for the appropriate conservation. When the first three stages for adaptability are not possible, or new challenges occur in the rural heritage study, modern methods should be developed for conservation actions. These methods should be studied by the experts, published with some guides, and recommended by the regulations. The properties of the rural heritage cover the tangible and intangible ones and should be documented for use when a transition treats it.

AC.2 Resource Accessibility: People need some services when using an area for living. Similarly, the traditional settlements and local people demand unique technologies and services in today's modern world. Infrastructure such as water supply, electricity, heating alternatives, telecommunication technologies, sewage, and waste management should be organized. Without these infrastructure systems, the abandonment of rural

settlements starts to be abandoned. According to the renewed vehicle technologies, the link between settlements is strengthened, and reaching the city center becomes easier. Therefore, the urban network of the rural heritage should be revised due to the discussions about the effect on the cultural heritage. Together with the physical requirements of the sites, the social, cultural, and economic opportunities should be planned by the local and governmental authorities through the urban plans.

6.1.2 Limitations of the study

Challenges arose in data collection and expert opinion questionaries throughout the research. Initially, insufficient data hindered a comprehensive analysis of habitıs transition effects on the rural heritage, creating obstacles in evaluating identified issues and establishing sustainability principles to mitigate them. Consequently, the assessment phase of the model was limited to several experts. Additionally, the primary limitations encountered during empirical studies are outlined as follows:

- When conducting the AHP method for the weight assessment, the experts generally need to become more familiar with the research topic and the pairwise comparison method. Therefore, even though the vulnerability assessment due to the habitus transition study and the steps of the AHP were explained, there can be some misunderstandings and deceptive answers from the experts.
- Due to the experts' busy schedules, it was impossible to organize a meeting with them and discuss the pairwise comparison results together. The experts compared the indicators and calculated the results individually.
- The model requires in-depth information about the selected site; however, due to the site's context, there can be less information, documents, and studies about rural heritage sites. Also, there is a need for in-depth surveys of the building units, but the entered building can be very limited due to abandonment and privacy issues.

The model offers the survey and documentation of each building and heritage property for the fill vulnerability cards and the definite vulnerability assessment. However, generally, locals refuse to open their properties for the study, especially for the intended surveys. This limitation can be solved with the authority's participation in the process and public awareness.

6.2 Societal Impact and Contribution to Global Sustainability

Studies have shown that the majority of literature on the sustainability of cultural heritage, as well as documents published by relevant organizations, have predominantly focused on natural disasters and climate change crises as significant threats. While disaster risks are defined as both natural and human-induced, efforts to prevent human-induced risks have primarily been limited to protecting cultural heritage during times of conflict. Although there have been studies aimed at preserving tangible heritage and enhancing its resilience for sustainability, there's a lack of research concerning the vulnerability and resilience of intangible heritage and its spirit.

One of the significant threats to living heritage sites is the gradual deterioration occurring over time, often unnoticed, resulting from abandonment or uncontrolled interventions as a consequence of transition demand. The original aspect of this thesis lies in considering the hazard posed by the changes that rural landscapes as heritage experience in their habitats and daily lives over time, a topic not extensively covered in previous literature. These changes, affecting not only tangible heritage areas but also the spirit of the place and intangible heritage values, are identified as potential threats in this study, forming another unique aspect of the research.

The transformations in habitats influence the most vibrant living heritage areas, rural landscapes, and vernacular architectural heritage sites, over time. The unchecked evolution of these natural changes leads to threats such as loss of value and the disappearance of the essence of heritage sites. Traditional architectural heritage areas, including rural architectural heritage, were categorized under the "Heritage at Risk" section in ICOMOS' initial report in 1999. This section highlighted the significance of uncontrolled and erroneous interventions or, conversely, abandonment-induced deteriorations, in line with the societal changes experienced over time. The thesis aims to contribute to the definition of human-induced risks in the literature by focusing on the gradual and perilous risk posed by habitus changes, which have not been adequately addressed in rural heritage areas.

The thesis' other unique aspect is its proposition to make rural landscapes a heritage, which are living and closely related to humans, developing a model for conserving and sustaining the presence of heritage with the resilience approaches. Similar to cultural heritage conservation approaches that advocate for sustainable life focusing on community and human aspects, as mentioned in the Burra Charter (1999) and the Faro Convention (2005), the most crucial role in enhancing the resilience of cultural heritage is assigned to communities. Numerous publications, guides, conferences, and studies released by relevant national and international institutions such as UNESCO, ICOMOS, ICCROM, UNDRR indicate that the resilience of cultural heritage in the face of risks is directly related to social resilience. While heritage is expected to adapt resiliently to risks, it is also anticipated to contribute to social resilience through its endurance and adaptations. Protecting heritage with community involvement and preserving the community with the cultural contributions of heritage are mutually reinforcing aspects that create a necessary balance for making the system resilient.

Cultural heritage holds an inherent worth for both the current and upcoming generations, and it also has the potential to significantly contribute to sustainable development across its diverse dimensions. A well-preserved World Heritage site has the potential to play a significant role in addressing poverty and disparities by offering essential goods and services, as well as serving as a repository of knowledge. These goods and services include security, healthcare, proper housing, access to clean air, water, food, and other crucial resources. Differently, the spiritual well-being of individuals is profoundly impacted by cultural heritage, characterized by its profound symbolic and aesthetic features. Preserving and acknowledging the diverse cultural and natural heritage, promoting fair access and equitable distribution of its benefits, enhances the sense of belonging and connection to a specific place. Moreover, it fosters mutual respect for others, a sense of purpose, and the ability to encourage communal well-being. These elements collectively enhance the social unity within a community and the autonomy and agency of both individuals and the community as a whole.

The most remarkable part of the thesis is the developed model for helping to provide sustainability and resilience for the rural heritage. Due to the limited number of risk assessment methods in the literature and the difficulty finding similar hazards defined for the thesis, the need for a new method arose. After literature studies and discussions about the development of resilience, the focus is decided on decreasing vulnerabilities. A new

model offered based on the vulnerability assessment and MCDM methods is selected as the assessment method. After the application of the model to Bağpınar rural heritage in Kayseri, the RUHET model helps to interpret overall vulnerabilities, susception, and capacity together with the detailed 34 indicators. According to these interpretations, the mitigation strategies can establish the decreasing vulnerability and increasing cope and adaptive capacity.

The RUHET model focuses on the identification of habitus transition hazards and vulnerabilities related to it as the first step in developing resilience methods for the sustainable preservation of rural architectural heritage. Within the scope of the thesis, hazards resulting from habitus changes that threaten the sustainability and cultural heritage values of rural architectural heritage are identified, and a model for contributing to creating resilience strategies is developed. United Nations Sustainable Development Goal 11, "Sustainable Cities and Communities," recommends appropriate planning strategies and management for resilient settlements. Additionally, the same goal emphasizes the importance of conserving cultural heritage. The dissertation contributes to rural landscape as heritage conservation studies and, therefore, offers decreasing susceptibility and lack of coping capacity while creating resilient and living rural heritage areas by preserving tangible and intangible cultural heritage values, as set out in Article 11. Another crucial element in making rural areas sustainable is the balance created between production and consumption, as mentioned in Goal 12, "Responsible Consumption and Production." The practices resulting from this balance shape rural daily life, settlements, and architecture. Therefore, the spatial resilience of local rural architecture is classified as ecological, cultural-social, and economic values, which are parameters of rural resilience.

Also, the rural heritage underscores the significance of traditional knowledge, the durability of historical materials, and the enduring nature of culture. Rural heritage sites face threats like transition, yet they also serve as valuable resources for adaptation and mitigation efforts against it. With these features, the model by conserving them can contribute to the UN SDG 4, 11, and 13. Safeguarding the tangible and intangible aspects of the rural heritage involves safeguarding interconnected societies, such as indigenous populations, who maintain profound environmental connections. Integrating culture and heritage connects individuals, cultivates societal unity and tranquility for the collective, and contributes to SDG 10, 11, 14, 15, and 16.

6.3 Future Prospects

Risk studies in cultural heritage have become an increasingly focused and broad area of research in recent years. The scope has been narrowed to "rural heritage areas" and "threat of habitus transition." In the scope of the thesis, the subject has been narrowed down through the vulnerabilities of rural heritage, using MCDM methods, and it is also effective with teams involving experts from various disciplines in many different frameworks.

The first point emphasized by the thesis, habitus, its changes, and its effects on heritage areas, offer a broad field of study. The impact of habitus should be discussed for rural heritage areas and all tangible and intangible cultural heritage. These discussions will reveal which areas of habitus are practical today and how its change will be considered a threat factor. Additionally, methods and approaches for "hazard assessment" related to habitus change, which requires a more comprehensive and interdisciplinary approach not covered in the thesis, can be developed. Thus, it can enable risk calculations in this regard. These studies should be conducted by working on different heritage groups to narrow down the topic because the effects and risks resulting from habitus change emerge in various ways on different types of heritage. Otherwise, due to the breadth of the topic, research will not be able to deepen, and findings will remain superficial.

The stages of model development and implementation have shown that habitus transition poses significant threats to rural heritage areas, and vulnerabilities must be reduced to conserve these areas sustainably. While this thesis examines the risks only posed by habitus change for the defined heritage areas, potential future research is left for the following due to the limitations of the thesis:

1. In this study, the effects of habitus change have only been examined through rural heritage areas. In future research, individual analyses should be conducted for all cultural heritage assets, and sustainability models should be developed accordingly.

2. Methods should be developed for assessing habitus change using multi-hazard approaches, thus enabling risk assessments to be conducted accordingly.

3. Different decision-making methods should be tested for the constructed model, comparisons should be made, and new methodologies should be developed for each heritage area.

4. The study serves as a leading framework for developing sustainable conservation methods in evolving rural heritage areas and sheds light on vulnerabilities in management mechanisms. In subsequent studies, risk management plans and rural conservation guidelines should be developed based on the model developed for selected heritage areas.

5. The assessment proposed by the model and the vulnerability values specific to settlements should be tested and further developed to be used by management authorities, which encompass many rural heritage areas, to compare, prioritize, and determine intervention sequences among settlements.

6. Solutions should be researched for building element systems that will not damage the fabric and essential values of heritage areas in Bağpınar as a case study, the selected rural heritage site, to reduce vulnerabilities, and a guide should be produced based on identified needs for conservation.

Cultural heritage studies, especially when dealing with complex systems, require involvement from various disciplines. In the suggested future studies mentioned above, it is recommended that decision support system experts collaborate with specialists in cultural heritage, architecture, urban design, landscape, and social sciences.

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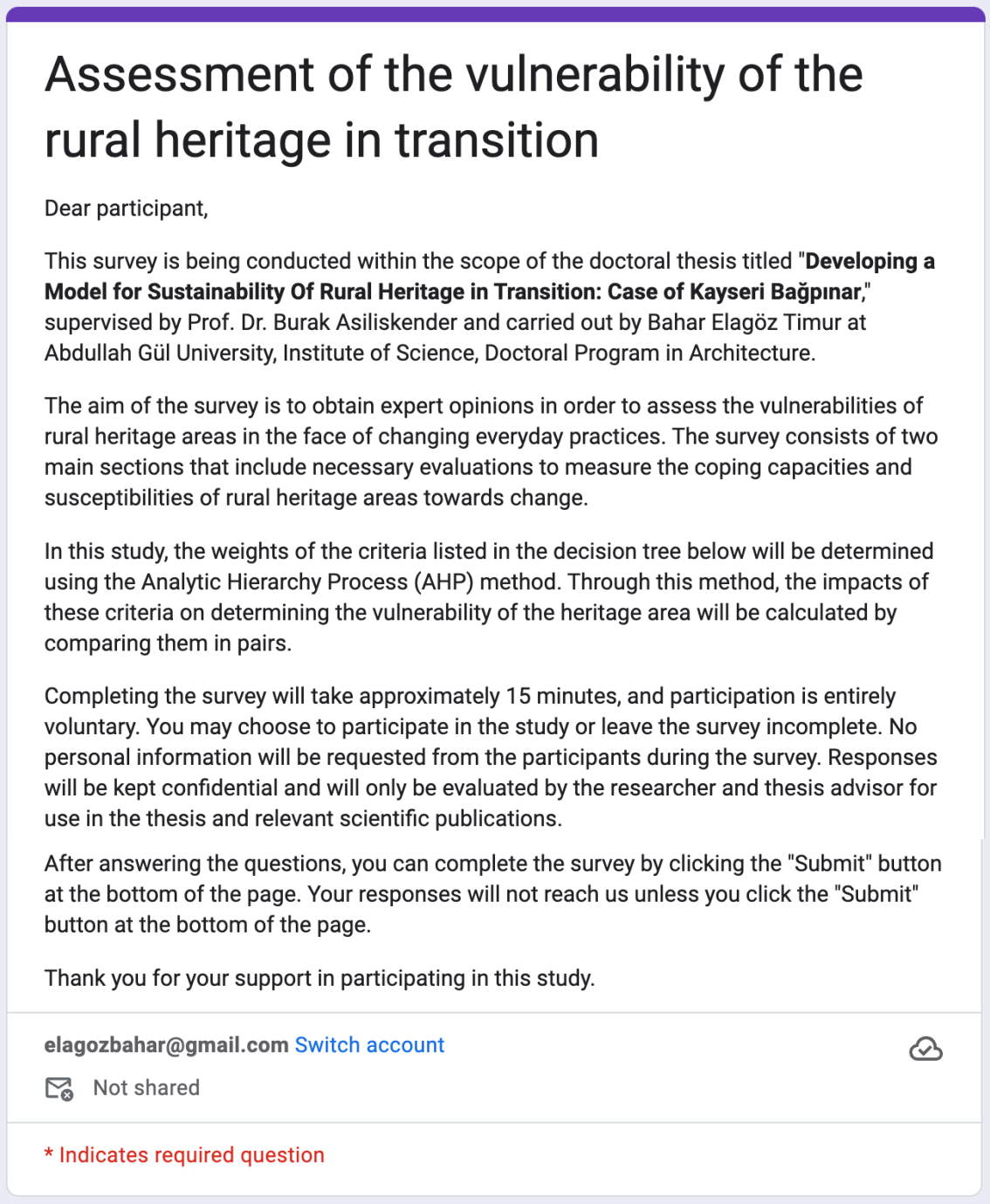
APPENDIX

Appendix A. Survey Questions



Assessment of the vulnerability of the rural heritage in transition

Dear participant,

This survey is being conducted within the scope of the doctoral thesis titled "**Developing a Model for Sustainability Of Rural Heritage in Transition: Case of Kayseri Bağpınar**," supervised by Prof. Dr. Burak Asiliskender and carried out by Bahar Elagöz Timur at Abdullah Gül University, Institute of Science, Doctoral Program in Architecture.

The aim of the survey is to obtain expert opinions in order to assess the vulnerabilities of rural heritage areas in the face of changing everyday practices. The survey consists of two main sections that include necessary evaluations to measure the coping capacities and susceptibilities of rural heritage areas towards change.

In this study, the weights of the criteria listed in the decision tree below will be determined using the Analytic Hierarchy Process (AHP) method. Through this method, the impacts of these criteria on determining the vulnerability of the heritage area will be calculated by comparing them in pairs.

Completing the survey will take approximately 15 minutes, and participation is entirely voluntary. You may choose to participate in the study or leave the survey incomplete. No personal information will be requested from the participants during the survey. Responses will be kept confidential and will only be evaluated by the researcher and thesis advisor for use in the thesis and relevant scientific publications.

After answering the questions, you can complete the survey by clicking the "Submit" button at the bottom of the page. Your responses will not reach us unless you click the "Submit" button at the bottom of the page.

Thank you for your support in participating in this study.

elagozbahar@gmail.com Switch account

Not shared

* Indicates required question

Figure A.1 Expert pairwise comparison Google Forms document (eng)

Name-Surname (This information is relevant for knowing the expertise areas of the individuals filling out the survey. If you wish, instead of your name, you can write your area of expertise and the institution you work for. For example; Architect in Municipality) *

Your answer

Next Clear form

Assessment of the vulnerability of the rural heritage in transition

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Comparison of Criteria

In this study, the weights of the criteria listed in the decision tree below will be determined using the Analytic Hierarchy Process (AHP) method. AHP is a method developed to deal with complex decisions, where criteria are integrated into a single hierarchical structure. With AHP, the impacts of criteria within the hierarchical structure are calculated by comparing them pairwise.

In this section, the importance levels of vulnerability criteria for rural heritage areas will be determined by comparing them pairwise within themselves. When making comparisons, starting from the Saalty Preference Table, decisions will be made about which criteria are more important and to what extent in the options created.
Note: The criterion written first should always be considered as the 1st criterion. For example; measures taken in the zoning plan (1st criterion)/registration status (2nd criterion).

The selected levels of importance and their definitions

Relative importance	Definition
(9)	The 1st criterion is extremely important than the 2nd criterion.
(7)	The 1st criterion is very strong important than the 2nd criterion.
(5)	The 1st criterion is essential important than the 2nd criterion.
(3)	The 1st criterion is moderate important than the 2nd criterion.
(1)	The 1st criterion is equally important to the 2nd criterion.
3	The 2nd criterion is moderate important than the 1st criterion.
5	The 2nd criterion is essential important than the 1st criterion.
7	The 2nd criterion is very strong important than the 1st criterion.
9	The 2nd criterion is extremely important than the 1st criterion.

Example;

Measures taken in the zoning plan / Registration status
(9) [ ] - **(7)** [ ] - **(5)** [ ] - **(3)** [ ]- **(1)** [ ] - **3** [ ] - **5** [X] - **7** [ ] - **9** [ ]
Means: The Registration Status is essential important than the Measures taken in the zoning plan.

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Assessment of the vulnerability of the rural heritage in transition

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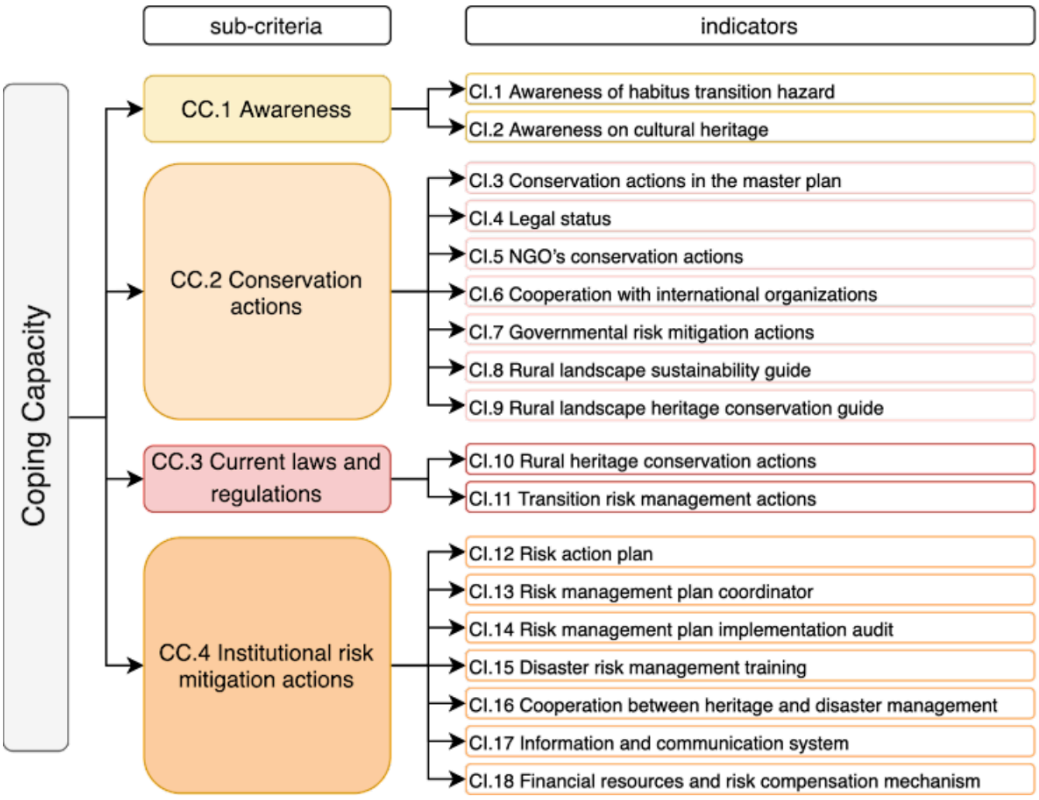
* Indicates required question

Section 1: Coping Capacity

Decision Tree of Coping Capacity



1. In this question, the importance of awareness of the subject, measures that can be taken for protection, current laws and regulations about transition threat, and mitigation strategies criteria will be compared to assess the capacity of a structure in a rural heritage area to cope with change. *

	(9)	(7)	(5)	(3)	(1)	3	5	7	9
Awareness / Conservation actions	○	○	○	○	○	○	○	○	○
Awareness/ Current laws and regulations	○	○	○	○	○	○	○	○	○

Awareness / Mitigation strategies	○	○	○	○	○	○	○	○	○
Conservation actions / Current laws and regulations	○	○	○	○	○	○	○	○	○
Conservation actions / Mitigation strategies	○	○	○	○	○	○	○	○	○
Conservation actions / Mitigation strategies	○	○	○	○	○	○	○	○	○
Current laws and regulations / Mitigation strategies	○	○	○	○	○	○	○	○	○

2. In this question, the awareness criterion will be evaluated by comparing the awareness of the community and the government regarding the threat in question and cultural heritage. *

	(9)	(7)	(5)	(3)	(1)	3	5	7	9
Awareness on threats / Awareness on the cultural heritage	○	○	○	○	○	○	○	○	○

3. In this question, the importance of measures that can be taken for the preservation of a structure in a rural heritage area will be compared by evaluating the significance of measures taken in the zoning plan, registration status, support from NGOs for conservation, support from international organizations, national risk policies, and the preparation of rural landscape and rural heritage guides. *

	(9)	(7)	(5)	(3)	(1)	3	5	7	9
Actions in the urban plan / Legal status	○	○	○	○	○	○	○	○	○
Actions in the urban plan/ NGO's con. actions	○	○	○	○	○	○	○	○	○
Actions in the urban plan / Cooperation with international organizations	○	○	○	○	○	○	○	○	○
Actions in the urban plan / Governmental risk mitigation actions	○	○	○	○	○	○	○	○	○
Actions in the urban plan / Rural landscape sustainability guide	○	○	○	○	○	○	○	○	○
Actions in the urban plan / Rural heritage conservation guide	○	○	○	○	○	○	○	○	○

Legal status / NGO's	○	○	○	○	○	○	○	○	○
Legal status / international organizations	○	○	○	○	○	○	○	○	○
Legal status / Governmental risk mitigation actions	○	○	○	○	○	○	○	○	○
Legal status / Rural landscape sustainability guide	○	○	○	○	○	○	○	○	○
Legal status/ Rural heritage conservation guide	○	○	○	○	○	○	○	○	○
NGO's / international organizations	○	○	○	○	○	○	○	○	○
NGO's / Governmental risk mitigation actions	○	○	○	○	○	○	○	○	○
NGO's / Rural landscape sustainability guide	○	○	○	○	○	○	○	○	○
NGO's / Rural heritage conservation guide	○	○	○	○	○	○	○	○	○
international organizations / ulusal risk politikaları	○	○	○	○	○	○	○	○	○

international organizations / Rural landscape sustainability guide	○	○	○	○	○	○	○	○	○
international organizations / Rural heritage conservation guide	○	○	○	○	○	○	○	○	○
Governmental risk mitigation actions / Rural landscape sustainability guide	○	○	○	○	○	○	○	○	○
Governmental risk mitigation actions / Rural heritage conservation guide	○	○	○	○	○	○	○	○	○
Rural landscape sustainability guide / Rural heritage conservation guide	○	○	○	○	○	○	○	○	○

4. In this question, the Current laws and regulations criterion will be evaluated by comparing the rural heritage conservation actions and the transition risk management actions. *

	(9)	(7)	(5)	(3)	(1)	3	5	7	9
rural heritage conservation actions / transition risk management actions	○	○	○	○	○	○	○	○	○

5. In this question, the importance of Transition risk mitigation strategies will be compared by evaluating the significance of measures taken in the risk action plan , risk management plan coordinator, risk management plan implementation audit, disaster risk management training, cooperation between heritage organizations and disaster management, information and communication system, and financial resources and risk compensation mechanism. *

	(9)	(7)	(5)	(3)	(1)	3	5	7	9
Risk action plan / Plan Coordinator	○	○	○	○	○	○	○	○	○
Risk action plan / Implementation audit	○	○	○	○	○	○	○	○	○
Risk action plan / Management training	○	○	○	○	○	○	○	○	○
Risk action plan / Cooperation	○	○	○	○	○	○	○	○	○
Risk action plan / Communication system	○	○	○	○	○	○	○	○	○

Risk action plan / Financial resources	○	○	○	○	○	○	○	○	○
Plan Coordinator / Implementation audit	○	○	○	○	○	○	○	○	○
Plan Coordinator / Management training	○	○	○	○	○	○	○	○	○
Plan Coordinator / Cooperation	○	○	○	○	○	○	○	○	○
Plan Coordinator / Communication system	○	○	○	○	○	○	○	○	○
Plan Coordinator / Financial resources	○	○	○	○	○	○	○	○	○
Implementation audit / Management training	○	○	○	○	○	○	○	○	○
Implementation audit / Cooperation	○	○	○	○	○	○	○	○	○
Implementation audit / Communication system	○	○	○	○	○	○	○	○	○
Implementation audit / Financial resources	○	○	○	○	○	○	○	○	○
Management training / uCooperation	○	○	○	○	○	○	○	○	○

Management training / Communication system	○	○	○	○	○	○	○	○	
Management training / Financial resources	○	○	○	○	○	○	○	○	
Cooperation / Communication system	○	○	○	○	○	○	○	○	
Cooperation / Rural heritage conservation guide	○	○	○	○	○	○	○	○	
Communication system / Financial resources	○	○	○	○	○	○	○	○	

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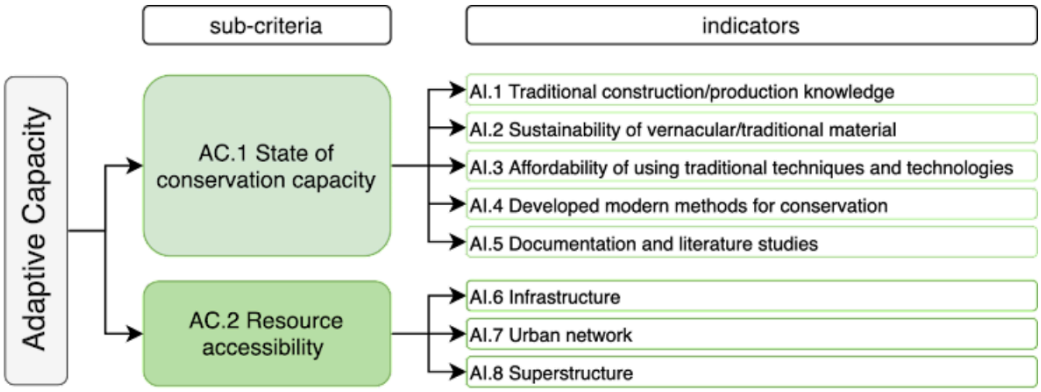
Section 2: Adaptive Capacity

Decision Tree of Adaptive Capacity



6. In this question, adaptive capacity sub-criteria comparison is asked. *

	(9)	(7)	(5)	(3)	(1)	3	5	7	9
State of conservation capacity / Resource accessibility	○	○	○	○	○	○	○	○	○

7. In this question, the assessment of the capacity to adapt in the conservation of a structure in a rural heritage area will be compared by evaluating the importance of traditional construction technique knowledge, sustainability of local materials, cost of traditional construction techniques, development of suitable modern methods, and documentation availability. *

	(9)	(7)	(5)	(3)	(1)	3	5	7	9
Construction knowledge / Sustainability of material	○	○	○	○	○	○	○	○	○
Construction knowledge / Affordability	○	○	○	○	○	○	○	○	○
Construction knowledge / Developed modern methods	○	○	○	○	○	○	○	○	○
Construction knowledge / Documentation	○	○	○	○	○	○	○	○	○
Sustainability of material / Affordability	○	○	○	○	○	○	○	○	○

Sustainability of material / Developed modern methods	○	○	○	○	○	○	○	○	○
Sustainability of material / Documentation	○	○	○	○	○	○	○	○	○
Affordability / Developed modern methods	○	○	○	○	○	○	○	○	○
Affordability / Documentation	○	○	○	○	○	○	○	○	○
Developed modern methods / Documentation	○	○	○	○	○	○	○	○	○

8. In this question, accessibility to resources in the preservation of a structure in a rural heritage area will be evaluated by assessing the importance of infrastructure works, superstructure works, and transportation connections to the city. *

	(9)	(7)	(5)	(3)	(1)	3	5	7	9
Infrastructure / Superstructure	○	○	○	○	○	○	○	○	○
Infrastructure / Urban network	○	○	○	○	○	○	○	○	○
Superstructure / Urban network	○	○	○	○	○	○	○	○	○

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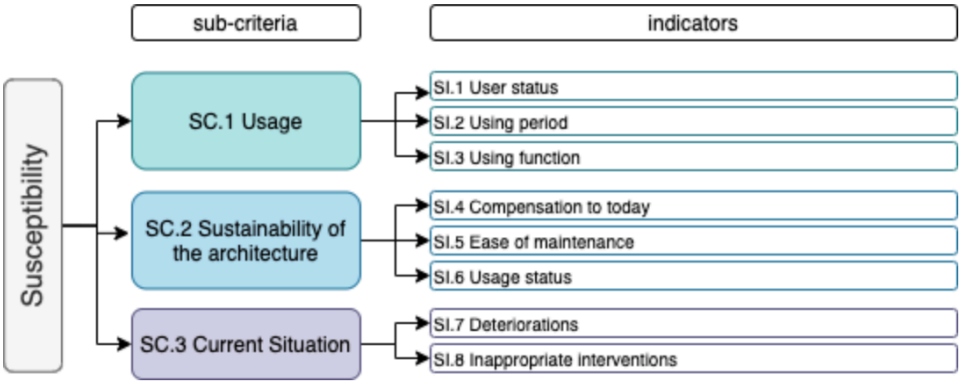
Section 3: Susceptibility

Decision Tree of the Susceptibility



9. In this question, the assessment of the susceptibility of a structure in a rural heritage area to change will be compared by evaluating the importance of the structure's usage, its ability to meet current demands, and its current condition measures. *

	(9)	(7)	(5)	(3)	(1)	3	5	7	9
Usage / Sustainability of the architecture	○	○	○	○	○	○	○	○	○
Usage / Current situation	○	○	○	○	○	○	○	○	○
Sustainability of the architecture / Current situation	○	○	○	○	○	○	○	○	○

10. In this question, the evaluation of the usage of a structure in a rural heritage area will be compared by assessing the importance of whether it has users, the duration of usage (seasonal or permanent), and whether the function changes or remains the same. *

	(9)	(7)	(5)	(3)	(1)	3	5	7	9
User status / Using period	○	○	○	○	○	○	○	○	○
User status / Using function	○	○	○	○	○	○	○	○	○
Using period / Using function	○	○	○	○	○	○	○	○	○

11. In this question, the assessment of the relevance of a structure in a rural heritage area will be compared by evaluating the importance of the ability of spaces to meet current needs, the ease of building maintenance, and the sustainability of space function. *

	(9)	(7)	(5)	(3)	(1)	3	5	7	9
Compensation to today / Ease of maintenance	○	○	○	○	○	○	○	○	○
Compensation to today / Usage status	○	○	○	○	○	○	○	○	○
Ease of maintenance / Usage status	○	○	○	○	○	○	○	○	○

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Figure A.2 Expert pairwise comparison Google Forms document explanation (tur)

Ad-Soyad (Bu bilgi anketi dolduran kişilerin uzmanlık alanlarının bilinmesi için geçerlidir. İsterseniz adınız yerine uzmanlık alanınız ve çalıştığınız kurumu yazabilirsiniz. Örneğin; Mimar, Kayseri KVKBK'unda Raportör.) *

Your answer

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Seçilecek olan önem dereceleri ve tanımları

önem dereceleri	değer tanımları
(9)	1. kriter 2. kriterden kesin derecede üstündür.
(7)	1. kriter 2. kriterden çok önemlidir.
(5)	1. kriter 2. kriterden oldukça önemlidir.
(3)	1. kriter 2. kriterden biraz daha önemlidir.
(1)	1. kriter ve 2. kriter eşit önemdedir.
3	2. kriter 1. kriterden biraz daha önemlidir.
5	2. kriter 1. kriterden oldukça önemlidir.
7	2. kriter 1. kriterden çok önemlidir.
9	2. kriter 1. kriterden kesin derecede üstündür.

Örnek;
İmar Planında Alınan Önlemler / Tescil Durumu
(9) [ ] - **(7)** [ ] - **(5)** [ ] - **(3)** [ ]- **(1)** [ ] - **3** [ ] - **5** [X] - **7** [ ] - **9** [ ]

Anlamı; Tescil Durumu, İmar Planında Alınan Önlemlerden oldukça önemlidir.

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Appendix B. Bağpınar Assessments and Results

Table B.1 Experts results for the coping capacity criterion

coping capacity - experts results																					
code	**E 1**	**E 2**	**E 3**	**E 4**	**E 5**	**E 6**	**E 7**	**E 8**	**E 9**	**weight (%)**	**code**	**E 1**	**E 2**	**E 3**	**E 4**	**E 5**	**E 6**	**E 7**	**E 8**	**E 9**	**weight (%)**
CC.1	52	40,4	52,2	43,4	14	5,1	28,2	12,2	20,3	**30**	CI.1	16,7	25	50	50	12,5	16,7	16,7	16,7	50	**28**
											CI.2	83,3	75	50	50	87,5	83,3	83,3	83,3	50	**72**
CC.2	18,8	34	20	17,6	9,5	52	21,3	39,6	17,1	**25**	CI.3	3,8	19,3	42,5	15,5	36,4	30,7	14,5	26,6	33,8	**25**
											CI.4	3,3	45,4	14,1	13,9	36,4	39,3	29,8	46,9	25,6	**28**
											CI.5	18,4	6,2	3,7	11,7	5,2	3,6	25,5	7,7	5,2	**10**
											CI.6	30,7	4,3	5,8	13,9	4,5	4,2	3,5	9,8	6,3	**9**
											CI.7	25,4	14,8	27,6	17,3	7,7	5,7	12,7	3,2	14,6	**14**
											CI.8	7,6	4,2	3,6	12,3	5,2	9,1	6,9	2,9	8	**7**
											CI.9	10,8	5,8	2,6	15,5	4,5	7,4	6,9	2,9	6,5	**7**
CC.3	23,2	13,9	20	19,5	50,6	23	42,5	36,7	48,5	**31**	CI.10	10,8	5,8	5,8	5,8	5,8	5,8	5,8	5,8	5,8	**7**
											CI.11	10,8	5,8	5,8	5,8	5,8	5,8	5,8	5,8	5,8	**7**
CC.4	6	11,7	7,8	19,5	25,9	19,9	8	11,5	14,1	**14**	CI.12	35,1	26,4	25,4	20	14,2	32,8	20	36,3	21,2	**26**
											CI.13	34,9	33	44	20	21,4	23,8	20	22,5	35,5	**28**
											CI.14	7,8	4,2	3,3	20	35	6,8	20	6,5	3,5	**12**
											CI.15	5,1	8,2	3,3	20	22,3	12	20	8	17,3	**13**
											CI.16	17	28,1	24	20	7,1	24,6	20	26,6	22,6	**21**
											CI.17	17	28,1	24	20	7,1	24,6	20	26,6	22,6	**21**
											CI.18	10	9	7,80	33.3	33,3	15,6	20	20	20	**17**

Table B.2 Experts results of the adaptive capacity and susceptibility criteria

adaptive capacity - experts results																				
code	**E 1**	**E 2**	**E 3**	**E 4**	**E 5**	**E 6**	**E 7**	**E 8**	**E 9**	**weight (%)**	**code**	**E 1**	**E 2**	**E 3**	**E 4**	**E 5**	**E 6**	**E 7**	**E 8**	**E 9**	**weight (%)**
AC.1	75	25	66,7	50	25	75	83,3	50	66,7	**57**	AI.1	35,1	26,4	25,4	20	14,2	32,8	20	36,3	21,2	**26**
											AI.2	34,9	33	44	20	21,4	23,8	20	22,5	35,5	**28**
											AI.3	7,8	4,2	3,3	20	35	6,8	20	6,5	3,5	**12**
											AI.4	5,1	8,2	3,3	20	22,3	12	20	8	17,3	**13**
											AI.5	17	28,1	24	20	7,1	24,6	20	26,6	22,6	**21**
AC.2	25	75	33,3	50	75	25	16,7	50	33,3	**43**	AI.6	45	45,5	43,5	33.3	33,3	74,5	60	20	60	**48**
											AI.7	10	9	7,80	33.3	33,3	15,6	20	20	20	**17**
											AI.8	45	45,5	48,7	33.3	33,3	9,9	20	60	20	**35**

susceptibilty - experts results																				
code	**E 1**	**E 2**	**E 3**	**E 4**	**E 5**	**E 6**	**E 7**	**E 8**	**E 9**	**weight (%)**	**code**	**E 1**	**E 2**	**E 3**	**E 4**	**E 5**	**E 6**	**E 7**	**E 8**	**E 9**	**weight (%)**
SC.1	61,5	45,5	77,8	33,4	71,4	14,3	60	10,5	71,4	**49**	SI.1	9,1	59,4	23,1	43,3	77,8	10,9	60	28,6	60	**41**
											SI.2	9,1	24,9	6	26	11,1	58,2	20	14,3	20	**21**
											SI.3	81,8	15,7	70,8	32,7	11,1	30,9	20	57,1	20	**38**
SC.2	30,8	9	11,1	33,3	14,3	71,4	20	63,7	14,3	**30**	SI.4	11,1	41,3	6,3	33,3	22,6	12,2	33,3	61,5	74,7	**33**
											SI.5	11,1	32,7	19,4	33,3	67,4	32	33,3	11,7	11,9	**28**
											SI.6	77,8	26	74,3	33,3	10,1	55,8	33,3	26,8	13,4	**39**
SC.3	7,7	45,5	11,1	33,3	14,3	14,3	20	25,8	14,3	**21**	SI.7	100	100	100	100	100	100	100	100	100	**100**

Table B.3 Expert 1 pairwise comparison calculations

Expert 1 Coping Capacity Weights		CC1	CC2	CC3	CC4	W
	CC1	1	3.00	3.00	6.00	52.0%
	CC2	0.33	1	1.00	3.00	18.8%
	CC3	0.33	1.00	1	6.00	23.3%
	CC4	0.17	0.33	0.17	1	6.0%
	number of comparisons: 6					100%
	consistency ratio CR: 4.3%					

Expert 1 Susceptibility Weights		SC.1	SC.2	SC.3	w
	SC.1	1	2.00	8.00	61.5%
	SC.2	0.50	1	4.00	30.8%
	SC.3	0.12	0.25	1	7.7%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 CC.1 Weights		CI.1	CI.2	W
	CI.1	1	0.20	16.7%
	CI.2	5.00	1	83.3%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.3 Weights		CI.10	CI.11	W
	CI.10	1	3.00	75.0%
	CI.11	0.33	1	25.0%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.2 Weights		CI.3	CI.4	CI.5	CI.6	CI.7	CI.8	CI.9	w
	CI.3	1	1.00	0.33	0.20	0.20	0.33	0.20	3.8%
	CI.4	1.00	1	0.33	0.14	0.14	0.20	0.20	3.3%
	CI.5	3.00	3.00	1	1.00	1.00	3.00	2.00	18.4%
	CI.6	5.00	7.00	1.00	1	2.00	5.00	5.00	30.7%
	CI.7	5.00	7.00	1.00	0.50	1	5.00	5.00	25.4%
	CI.8	3.00	5.00	0.33	0.20	0.20	1	0.50	7.6%
	CI.9	5.00	5.00	0.50	0.20	0.20	2.00	1	10.8%
	number of comparisons: 21								100%
	consistency ratio CR: 7.7%								

Expert 1 Adaptive Capacity Weights		AC.1	AC.2	W
	AC.1	1	3.00	75.0%
	AC.2	0.33	1	25.0%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.4 Weights		CI.12	CI.13	CI.14	CI.15	CI.16	CI.17	CI.18	w
	CI.12	1	2.00	3.00	4.00	4.00	5.00	5.00	34.0%
	CI.13	0.50	1	1.00	3.00	3.00	3.00	1.00	16.4%
	CI.14	0.33	1.00	1	3.00	4.00	3.00	4.00	20.3%
	CI.15	0.25	0.33	0.33	1	1.00	3.00	1.00	7.7%
	CI.16	0.25	0.33	0.25	1.00	1	4.00	2.00	9.1%
	CI.17	0.20	0.33	0.33	0.33	0.25	1	0.25	4.0%
	CI.18	0.20	1.00	0.25	1.00	0.50	4.00	1	8.6%
	number of comparisons: 21								100%
	consistency ratio CR: 7.1%								

Expert 1 AC.1 Weights		AI.1	AI.2	AI.3	AI.4	AI.5	w
	AI.1	1	1.00	3.00	7.00	3.00	35.1%
	AI.2	1.00	1	5.00	7.00	2.00	34.9%
	AI.3	0.33	0.20	1	1.00	0.50	7.8%
	AI.4	0.14	0.14	1.00	1	0.20	5.1%
	AI.5	0.33	0.50	2.00	5.00	1	17.0%
	number of comparisons: 10						100%
	consistency ratio CR: 3.0%						

Expert 1 AC.2 Weights		AI.6	AI.2	AI.3	w
	AI.6	1	1.00	5.00	45.5%
	AI.7	1.00	1	5.00	45.5%
	AI.8	0.20	0.20	1	9.0%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 SC.1 Weights		SI.1	SI.2	SI.3	w
	SI.1	1	1.00	0.11	9.1%
	SI.2	1.00	1	0.11	9.1%
	SI.3	9.00	9.00	1	81.8%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 SC.2 Weights		SI.4	SI.5	SI.6	w
	SI.4	1	1.00	0.14	11.1%
	SI.5	1.00	1	0.14	11.1%
	SI.6	7.00	7.00	1	77.8%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Table B.4 Expert 2 pairwise comparison calculations

Expert 1 Coping Capacity Weights		CC1	CC2	CC3	CC4	W
	CC1	1	1.00	3.00	4.00	40.4%
	CC2	1.00	1	2.00	3.00	34.0%
	CC3	0.33	0.50	1	1.00	13.9%
	CC4	0.25	0.33	1.00	1	11.7%
	number of comparisons: 6					100%
	consistency ratio CR: 1.1%					

Expert 1 Susceptibility Weights		SC.1	SC.2	SC.3	w
	SC.1	1	5.00	1.00	45.5%
	SC.2	0.20	1	0.20	9.0%
	SC.3	1.00	5.00	1	45.5%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 CC.1 Weights		CI.1	CI.2	W
	CI.1	1	0.33	25.0%
	CI.2	3.00	1	75.0%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.3 Weights		CI.10	CI.11	W
	CI.10	1	0.33	25.0%
	CI.11	3.00	1	75.0%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.2 Weights		CI.3	CI.4	CI.5	CI.6	CI.7	CI.8	CI.9	w
	CI.3	1	0.33	3.00	5.00	3.00	3.00	3.00	19.3%
	CI.4	3.00	1	7.00	7.00	7.00	7.00	7.00	45.4%
	CI.5	0.33	0.14	1	1.00	1.00	1.00	1.00	6.2%
	CI.6	0.20	0.14	1.00	1	0.14	1.00	1.00	4.3%
	CI.7	0.33	0.14	1.00	7.00	1	5.00	5.00	14.8%
	CI.8	0.33	0.14	1.00	1.00	0.20	1	0.33	4.2%
	CI.9	0.33	0.14	1.00	1.00	0.20	3.00	1	5.8%
	number of comparisons: 21								100%
	consistency ratio CR: 8.9%								

Expert 1 Adaptive Capacity Weights		AC.1	AC.2	W
	AC.1	1	0.33	25.0%
	AC.2	3.00	1	75.0%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.4 Weights		CI.12	CI.13	CI.14	CI.15	CI.16	CI.17	CI.18	w
	CI.12	1	1.00	1.00	2.00	2.00	2.00	1.00	17.0%
	CI.13	0.50	1	1.00	3.00	3.00	3.00	1.00	20.3%
	CI.14	0.33	1.00	1	4.00	3.00	4.00	1.00	22.4%
	CI.15	0.25	0.33	0.33	1	1.00	1.00	1.00	8.4%
	CI.16	0.25	0.33	0.25	1.00	1	1.00	1.00	8.7%
	CI.17	0.20	0.33	0.33	0.33	0.25	1	0.25	6.7%
	CI.18	0.20	1.00	0.25	1.00	0.50	4.00	1	16.5%
	number of comparisons: 21								100%
	consistency ratio CR: 7.1%								

Expert 1 AC.1 Weights		AI.1	AI.2	AI.3	AI.4	AI.5	w
	AI.1	1	1.00	5.00	3.00	1.00	26.4%
	AI.2	1.00	1	9.00	5.00	1.00	33.0%
	AI.3	0.20	0.11	1	0.50	0.14	4.2%
	AI.4	0.33	0.20	2.00	1	0.33	8.2%
	AI.5	1.00	1.00	7.00	3.00	1	28.1%
	number of comparisons: 10						100%
	consistency ratio CR: 1.0%						

Expert 1 AC.2 Weights		AI.6	AI.2	AI.3	w
	AI.6	1	1.00	5.00	45.5%
	AI.7	1.00	1	5.00	45.5%
	AI.8	0.20	0.20	1	9.0%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 SC.1 Weights		SI.1	SI.2	SI.3	w
	SI.1	1	3.00	3.00	59.4%
	SI.2	0.33	1	2.00	24.9%
	SI.3	0.33	0.50	1	15.7%
	number of comparisons: 3				100%
	consistency ratio CR: 5.6%				

Expert 1 SC.2 Weights		SI.4	SI.5	SI.6	w
	SI.4	1	1.00	2.00	41.3%
	SI.5	1.00	1	1.00	32.7%
	SI.6	0.50	1.00	1	26.0%
	number of comparisons: 3				100%
	consistency ratio CR: 5.6%				

Table B.5 Expert 3 pairwise comparison calculations

Expert 1 Coping Capacity Weights		CC1	CC2	CC3	CC4	W
	CC1	1	3.00	3.00	5.00	52.0%
	CC2	0.33	1	1.00	3.00	20.0%
	CC3	0.33	1.00	1	3.00	20.0%
	CC4	0.20	0.33	0.33	1	7.8%
	number of comparisons: 6					100%
	consistency ratio CR: 1.6%					

Expert 1 Susceptibility Weights		SC.1	SC.2	SC.3	w
	SC.1	1	7.00	7.00	77.8%
	SC.2	0.14	1	1.00	11.1%
	SC.3	0.14	1.00	1	11.1%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 CC.1 Weights		CI.1	CI.2	W
	CI.1	1	1.00	50.0%
	CI.2	1.00	1	50.0%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.3 Weights		CI.10	CI.11	W
	CI.10	1	3.00	75.0%
	CI.11	0.33	1	25.0%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.2 Weights		CI.3	CI.4	CI.5	CI.6	CI.7	CI.8	CI.9	w
	CI.3	1	5.00	9.00	5.00	3.00	9.00	9.00	42.5%
	CI.4	0.20	1	5.00	2.00	0.50	4.00	9.00	14.1%
	CI.5	0.11	0.20	1	1.00	0.14	1.00	1.00	3.7%
	CI.6	0.20	0.50	1.00	1	0.11	2.00	3.00	5.8%
	CI.7	0.33	2.00	7.00	9.00	1	9.00	9.00	27.6%
	CI.8	0.11	0.25	1.00	0.50	0.11	1	2.00	3.6%
	CI.9	0.11	0.11	1.00	0.33	0.11	0.50	1	2.6%
	number of comparisons: 21								100%
	consistency ratio CR: 5.0%								

Expert 1 Adaptive Capacity Weights		AC.1	AC.2	W
	AC.1	1	2.00	66.7%
	AC.2	0.50	1	33.3%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.4 Weights		CI.12	CI.13	CI.14	CI.15	CI.16	CI.17	CI.18	w
	CI.12	1	1.00	1.00	1.00	1.00	1.00	1.00	14.3%
	CI.13	1.00	1	1.00	1.00	1.00	1.00	1.00	14.3%
	CI.14	1.00	1.00	1	1.00	1.00	1.00	1.00	14.3%
	CI.15	1.00	1.00	1.00	1	1.00	1.00	1.00	14.3%
	CI.16	1.00	1.00	1.00	1.00	1	1.00	1.00	14.3%
	CI.17	1.00	1.00	1.00	1.00	1.00	1	1.00	14.3%
	CI.18	1.00	1.00	1.00	1.00	1.00	1.00	1	14.3%
	number of comparisons: 21								100%
	consistency ratio CR: 0.0%								

Expert 1 AC.1 Weights		AI.1	AI.2	AI.3	AI.4	AI.5	w
	AI.1	1	0.50	9.00	9.00	1.00	25.4%
	AI.2	2.00	1	9.00	9.00	3.00	44.0%
	AI.3	0.11	0.11	1	1.00	0.11	3.3%
	AI.4	0.11	0.11	1.00	1	0.11	3.3%
	AI.5	1.00	0.33	9.00	9.00	1	24.0%
	number of comparisons: 10						100%
	consistency ratio CR: 3.2%						

Expert 1 AC.2 Weights		AI.6	AI.2	AI.3	w
	AI.6	1	1.00	5.00	43.5%
	AI.7	1.00	1	7.00	48.7%
	AI.8	0.20	0.14	1	7.8%
	number of comparisons: 3				100%
	consistency ratio CR: 1.3%				

Expert 1 SC.1 Weights		SI.1	SI.2	SI.3	w
	SI.1	1	5.00	0.25	23.2%
	SI.2	0.20	1	0.11	6.0%
	SI.3	4.00	9.00	1	70.8%
	number of comparisons: 3				100%
	consistency ratio CR: 7.4%				

Expert 1 SC.2 Weights		SI.4	SI.5	SI.6	w
	SI.4	1	0.25	0.11	6.3%
	SI.5	4.00	1	0.20	19.4%
	SI.6	9.00	5.00	1	74.3%
	number of comparisons: 3				100%
	consistency ratio CR: 7.4%				

Table B.6 Expert 4 pairwise comparison calculations

Expert 1 Coping Capacity Weights		CC1	CC2	CC3	CC4	W
	CC1	1	3.00	2.00	2.00	43.4%
	CC2	0.33	1	1.00	1.00	17.7%
	CC3	0.50	1.00	1	1.00	19.5%
	CC4	0.50	1.00	1.00	1	19.5%
	number of comparisons: 6					100%
	consistency ratio CR: 0.8%					

Expert 1 Susceptibility Weights		SC.1	SC.2	SC.3	w
	SC.1	1	1.00	1.00	33.3%
	SC.2	1.00	1	1.00	33.3%
	SC.3	1.00	1.00	1	33.3%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 CC.1 Weights		CI.1	CI.2	W
	CI.1	1	1.00	50.0%
	CI.2	1.00	1	50.0%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.3 Weights		CI.10	CI.11	W
	CI.10	1	3.00	75.0%
	CI.11	0.33	1	25.0%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.2 Weights		CI.3	CI.4	CI.5	CI.6	CI.7	CI.8	CI.9	w
	CI.3	1	1.00	2.00	1.00	1.00	1.00	1.00	15.5%
	CI.4	1.00	1	1.00	1.00	1.00	1.00	1.00	13.9%
	CI.5	0.50	1.00	1	1.00	1.00	1.00	0.50	11.7%
	CI.6	1.00	1.00	1.00	1	1.00	1.00	1.00	13.9%
	CI.7	1.00	1.00	1.00	1.00	1	3.00	1.00	17.3%
	CI.8	1.00	1.00	1.00	1.00	0.33	1	1.00	12.3%
	CI.9	1.00	1.00	2.00	1.00	1.00	1.00	1	15.5%
	number of comparisons: 21								100%
	consistency ratio CR: 2.6%								

Expert 1 Adaptive Capacity Weights			
	AC.1	AC.2	W
AC.1	1	1.00	50.0%
AC.2	1.00	1	50.0%
NoC: 1			NoC: 1
CR: 0			

Expert 1 CC.4 Weights		CI.12	CI.13	CI.14	CI.15	CI.16	CI.17	CI.18	w
	CI.12	1	4.00	3.00	1.00	4.00	4.00	1.00	24.4%
	CI.13	0.25	1	2.00	0.25	2.00	2.00	0.25	9.0%
	CI.14	0.33	0.50	1	0.50	1.00	1.00	0.50	7.6%
	CI.15	1.00	4.00	2.00	1	4.00	4.00	0.50	21.6%
	CI.16	0.25	0.50	1.00	0.25	1	1.00	0.25	5.7%
	CI.17	0.25	0.50	1.00	0.25	1.00	1	0.33	6.0%
	CI.18	1.00	4.00	2.00	2.00	4.00	3.00	1	25.5%
	number of comparisons: 21								100%
	consistency ratio CR: 3.5%								

Expert 1 AC.1 Weights		AI.1	AI.2	AI.3	AI.4	AI.5	w
	AI.1	1	1.00	1.00	1.00	1.00	20.0%
	AI.2	1.00	1	1.00	1.00	1.00	20.0%
	AI.3	1.00	1.00	1	1.00	1.00	20.0%
	AI.4	1.00	1.00	1.00	1	1.00	20.0%
	AI.5	1.00	1.00	1.00	1.00	1	20.0%
	number of comparisons: 10						100%
	consistency ratio CR: 0.0%						

Expert 1 AC.2 Weights		AI.6	AI.2	AI.3	w
	AI.6	1	1.00	1.00	33.3%
	AI.7	1.00	1	1.00	33.3%
	AI.8	1.00	1.00	1	33.3%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 SC.1 Weights		SI.1	SI.2	SI.3	w
	SI.1	1	2.00	1.00	41.3%
	SI.2	0.50	1	1.00	26.0%
	SI.3	1.00	1.00	1	32.7%
	number of comparisons: 3				100%
	consistency ratio CR: 5.6%				

Expert 1 SC.2 Weights		SI.4	SI.5	SI.6	w
	SI.4	1	1.00	1.00	33.3%
	SI.5	1.00	1	1.00	33.3%
	SI.6	1.00	1.00	1	33.3%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Table B.7 Expert 5 pairwise comparison calculations

Expert 1 Coping Capacity Weights		CC1	CC2	CC3	CC4	W
	CC1	1	2.00	0.25	0.50	14.0%
	CC2	0.50	1	0.33	0.25	9.5%
	CC3	4.00	3.00	1	3.00	50.6%
	CC4	2.00	4.00	0.33	1	25.9%
	number of comparisons: 6					100%
	consistency ratio CR: 7.2%					

Expert 1 Susceptibility Weights		SC.1	SC.2	SC.3	w
	SC.1	1	5.00	5.00	71.4%
	SC.2	0.20	1	1.00	14.3%
	SC.3	0.20	1.00	1	14.3%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 CC.1 Weights		CI.1	CI.2	W
	CI.1	1	0.14	12.5%
	CI.2	7.00	1	87.5%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.3 Weights		CI.10	CI.11	W
	CI.10	1	3.00	75.0%
	CI.11	0.33	1	25.0%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.2 Weights		CI.3	CI.4	CI.5	CI.6	CI.7	CI.8	CI.9	w
	CI.3	1	1.00	7.00	7.00	7.00	7.00	7.00	36.4%
	CI.4	1.00	1	7.00	7.00	7.00	7.00	7.00	36.4%
	CI.5	0.14	0.14	1	1.00	1.00	1.00	1.00	5.2%
	CI.6	0.14	0.14	1.00	1	0.33	1.00	1.00	4.5%
	CI.7	0.14	0.14	1.00	3.00	1	1.00	3.00	7.7%
	CI.8	0.14	0.14	1.00	1.00	1.00	1	1.00	5.2%
	CI.9	0.14	0.14	1.00	1.00	0.33	1.00	1	4.5%
	number of comparisons: 21								100%
	consistency ratio CR: 2.6%								

Expert 1 Adaptive Capacity Weights		AC.1	AC.2	W
	AC.1	1	0.33	25.0%
	AC.2	1.3.00	1	75.0%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.4 Weights		CI.12	CI.13	CI.14	CI.15	CI.16	CI.17	CI.18	w
	CI.12	1	3.00	3.00	2.00	4.00	4.00	1.00	23.7%
	CI.13	0.33	1	2.00	1.00	2.00	2.00	0.25	13.9%
	CI.14	0.33	0.50	1	0.33	0.33	0.33	0.33	5.2%
	CI.15	0.50	1.00	3.00	1	3.00	3.00	0.50	15.9%
	CI.16	0.50	0.33	3.00	0.33	1	1.00	0.50	8.8%
	CI.17	0.33	0.33	3.00	0.33	1.00	1	0.50	8.3%
	CI.18	1.00	4.00	3.00	2.00	2.00	2.00	1	24.4%
	number of comparisons: 21								100%
	consistency ratio CR: 7.2%								

Expert 1 AC.1 Weights		AI.1	AI.2	AI.3	AI.4	AI.5	w
	AI.1	1	1.00	0.33	0.33	3.00	14.2%
	AI.2	1.00	1	1.00	1.00	3.00	21.4%
	AI.3	3.00	1.00	1	3.00	3.00	35.0%
	AI.4	3.00	1.00	0.33	1	3.00	22.3%
	AI.5	0.33	0.33	0.33	0.33	1	7.1%
	number of comparisons: 10						100%
	consistency ratio CR: 7.8%						

Expert 1 AC.2 Weights		AI.6	AI.2	AI.3	w
	AI.6	1	1.00	1.00	33.3%
	AI.7	1.00	1	1.00	33.3%
	AI.8	1.00	1.00	1	33.3%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 SC.1 Weights		SI.1	SI.2	SI.3	w
	SI.1	1	7.00	7.00	77.8%
	SI.2	0.14	1	1.00	11.1%
	SI.3	0.14	1.00	1	11.1%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 SC.2 Weights		SI.4	SI.5	SI.6	w
	SI.4	1	0.25	3.00	22.6%
	SI.5	4.00	1	5.00	67.4%
	SI.6	0.33	0.20	1	10.1%
	number of comparisons: 3				100%
	consistency ratio CR: 9.0%				

Table B.8 Expert 6 pairwise comparison calculations

Expert 1 Coping Capacity Weights		CC1	CC2	CC3	CC4	W
	CC1	1	0.14	0.20	0.20	5.1%
	CC2	7.00	1	2.00	4.00	52.0%
	CC3	5.00	0.50	1	1.00	23.0%
	CC4	5.00	0.25	1.00	1	19.9%
	number of comparisons: 6					100%
	consistency ratio CR: 4.0%					

Expert 1 Susceptibility Weights		SC.1	SC.2	SC.3	w
	SC.1	1	0.20	1.00	14.3%
	SC.2	5.00	1	5.00	71.4%
	SC.3	1.00	0.20	1	14.3%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 CC.1 Weights		CI.1	CI.2	W
	CI.1	1	0.20	16.7%
	CI.2	5.00	1	83.3%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.3 Weights		CI.10	CI.11	W
	CI.10	1	3.00	75.0%
	CI.11	0.33	1	25.0%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.2 Weights		CI.3	CI.4	CI.5	CI.6	CI.7	CI.8	CI.9	w
	CI.3	1	0.50	7.00	7.00	0.20	0.33	7.00	30.7%
	CI.4	2.00	1	5.00	5.00	7.00	7.00	7.00	39.3%
	CI.5	0.14	0.20	1	1.00	0.33	0.33	0.33	3.6%
	CI.6	0.14	0.20	1.00	1	1.00	0.33	0.33	4.2%
	CI.7	0.20	0.14	3.00	1.00	1	0.33	1.00	5.7%
	CI.8	0.20	0.14	3.00	3.00	3.00	1	1.00	9.1%
	CI.9	0.14	0.14	3.00	3.00	1.00	1.00	1	7.4%
	number of comparisons: 21								100%
	consistency ratio CR: 6.5%								

Expert 1 Adaptive Capacity Weights		AC.1	AC.2	W
	AC.1	1	3.00	75.0%
	AC.2	0.33	1	25.0%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.4 Weights		CI.12	CI.13	CI.14	CI.15	CI.16	CI.17	CI.18	w
	CI.12	1	1.00	1.00	1.00	3.00	3.00	1.00	20.5%
	CI.13	1.00	1	1.00	1.00	1.00	1.00	1.00	13.9%
	CI.14	1.00	1.00	1	1.00	1.00	1.00	1.00	13.9%
	CI.15	1.00	1.00	1.00	1	1.00	1.00	1.00	13.9%
	CI.16	0.33	1.00	1.00	1.00	1	1.00	1.00	12.0%
	CI.17	0.33	1.00	1.00	1.00	1.00	1	1.00	12.0%
	CI.18	1.00	1.00	1.00	1.00	1.00	1.00	1	13.9%
	number of comparisons: 21								100%
	consistency ratio CR: 2.6%								

Expert 1 AC.1 Weights		AI.1	AI.2	AI.3	AI.4	AI.5	w
	AI.1	1	1.00	5.00	5.00	1.00	32.8%
	AI.2	1.00	1	5.00	1.00	1.00	23.8%
	AI.3	0.20	0.20	1	0.50	0.50	6.8%
	AI.4	0.20	1.00	2.00	1	0.33	12.0%
	AI.5	1.00	1.00	2.00	3.00	1	24.5%
	number of comparisons: 10						100%
	consistency ratio CR: 7.6%						

Expert 1 AC.2 Weights		AI.6	AI.2	AI.3	w
	AI.6	1	6.00	6.00	74.5%
	AI.7	0.17	1	2.00	15.6%
	AI.8	0.17	0.50	1	9.9%
	number of comparisons: 3				100%
	consistency ratio CR: 5.6%				

Expert 1 SC.1 Weights		SI.1	SI.2	SI.3	w
	SI.1	1	0.20	0.33	10.9%
	SI.2	5.00	1	2.00	58.2%
	SI.3	3.00	0.50	1	30.9%
	number of comparisons: 3				100%
	consistency ratio CR: 0.4%				

Expert 1 SC.2 Weights		SI.4	SI.5	SI.6	w
	SI.4	1	0.33	0.25	12.2%
	SI.5	3.00	1	0.50	32.0%
	SI.6	4.00	2.00	1	55.8%
	number of comparisons: 3				100%
	consistency ratio CR: 1.9%				

Table B.9 Expert 7 pairwise comparison calculations

Expert 1 Coping Capacity Weights		CC1	CC2	CC3	CC4	W
	CC1	1	1.00	1.00	3.00	28.2%
	CC2	1.00	1	0.33	3.00	21.3%
	CC3	1.00	3.00	1	5.00	42.5%
	CC4	0.33	0.33	0.20	1	8.0%
	number of comparisons: 6					100%
	consistency ratio CR: 4.2%					

Expert 1 Susceptibility Weights		SC.1	SC.2	SC.3	w
	SC.1	1	3.00	3.00	60.0%
	SC.2	0.33	1	1.00	20.0%
	SC.3	0.33	1.00	1	20.0%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 CC.1 Weights		CI.1	CI.2	W
	CI.1	1	0.20	16.7%
	CI.2	5.00	1	83.3%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.3 Weights		CI.10	CI.11	W
	CI.10	1	3.00	75.0%
	CI.11	0.33	1	25.0%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.2 Weights		CI.3	CI.4	CI.5	CI.6	CI.7	CI.8	CI.9	w
	CI.3	1	0.20	1.00	3.00	1.00	3.00	3.00	14.5%
	CI.4	5.00	1	1.00	5.00	1.00	5.00	5.00	29.8%
	CI.5	1.00	1.00	1	5.00	3.00	5.00	5.00	25.5%
	CI.6	0.33	0.20	0.20	1	0.20	0.33	0.33	3.5%
	CI.7	1.00	1.00	0.33	5.00	1	1.00	1.00	12.7%
	CI.8	0.33	0.20	0.20	3.00	1.00	1	1.00	6.9%
	CI.9	0.33	0.20	0.20	3.00	1.00	1.00	1	6.9%
	number of comparisons: 21								100%
	consistency ratio CR: 7.8%								

Expert 1 Adaptive Capacity Weights			
	AC.1	AC.2	W
AC.1	1	5.00	83.3%
AC.2	0.20	1	16.7%
NoC: 1			100%
CR: 0			

Expert 1 CC.4 Weights		CI.12	CI.13	CI.14	CI.15	CI.16	CI.17	CI.18	w
	CI.12	1	1.00	1.00	1.00	3.00	3.00	1.00	17.3%
	CI.13	1.00	1	1.00	1.00	4.00	4.00	1.00	18.8%
	CI.14	1.00	1.00	1	1.00	3.00	4.00	1.00	17.9%
	CI.15	1.00	1.00	1.00	1	3.00	3.00	1.00	17.3%
	CI.16	0.33	0.25	0.33	0.33	1	2.00	0.33	6.2%
	CI.17	0.33	0.25	0.25	0.33	0.50	1	0.25	4.7%
	CI.18	1.00	1.00	1.00	1.00	3.00	4.00	1	17.9%
	number of comparisons: 21								100%
	consistency ratio CR: 0.7%								

Expert 1 AC.1 Weights		AI.1	AI.2	AI.3	AI.4	AI.5	w
	AI.1	1	1.00	1.00	1.00	1.00	20.0%
	AI.2	1.00	1	1.00	1.00	1.00	20.0%
	AI.3	1.00	1.00	1	1.00	1.00	20.0%
	AI.4	1.00	1.00	1.00	1	1.00	20.0%
	AI.5	1.00	1.00	1.00	1.00	1	20.0%
	number of comparisons: 10						100%
	consistency ratio CR: 0.0%						

Expert 1 AC.2 Weights		AI.6	AI.2	AI.3	w
	AI.6	1	3.00	3.00	60.0%
	AI.7	0.33	1	1.00	20.0%
	AI.8	0.33	1.00	1	20.0%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 SC.1 Weights		SI.1	SI.2	SI.3	w
	SI.1	1	3.00	3.00	60.0%
	SI.2	0.33	1	1.00	20.0%
	SI.3	0.33	1.00	1	20.0%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 SC.2 Weights		SI.4	SI.5	SI.6	w
	SI.4	1	0.25	3.00	22.6%
	SI.5	4.00	1	5.00	67.4%
	SI.6	0.33	0.20	1	10.1%
	number of comparisons: 3				100%
	consistency ratio CR: 9.0%				

Table B.10 Expert 8 pairwise comparison calculations

Expert 1 Coping Capacity Weights		CC1	CC2	CC3	CC4	W
	CC1	1	0.33	0.33	1.00	12.2%
	CC2	3.00	1	1.00	4.00	39.6%
	CC3	3.00	1.00	1	3.00	36.7%
	CC4	1.00	0.25	0.33	1	11.4%
	number of comparisons: 6					100%
	consistency ratio CR: 0.4%					

Expert 1 Susceptibility Weights		SC.1	SC.2	SC.3	w
	SC.1	1	0.20	0.33	10.5%
	SC.2	5.00	1	3.00	63.7%
	SC.3	3.00	0.33	1	25.8%
	number of comparisons: 3				100%
	consistency ratio CR: 4.0%				

Expert 1 CC.1 Weights		CI.1	CI.2	W
	CI.1	1	0.20	16.7%
	CI.2	5.00	1	83.3%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.3 Weights		CI.10	CI.11	W
	CI.10	1	3.00	75.0%
	CI.11	0.33	1	25.0%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.2 Weights		CI.3	CI.4	CI.5	CI.6	CI.7	CI.8	CI.9	w
	CI.3	1	0.33	5.00	5.00	5.00	9.00	9.00	26.6%
	CI.4	3.00	1	7.00	9.00	9.00	9.00	9.00	46.9%
	CI.5	0.20	0.14	1	1.00	3.00	3.00	3.00	7.6%
	CI.6	0.20	0.11	1.00	1	5.00	5.00	5.00	9.8%
	CI.7	0.20	0.11	0.33	0.20	1	1.00	1.00	3.2%
	CI.8	0.11	0.11	0.33	0.20	1.00	1	1.00	2.9%
	CI.9	0.11	0.11	0.33	0.20	1.00	1.00	1	2.9%
	number of comparisons: 21								100%
	consistency ratio CR: 5.6%								

Expert 1 Adaptive Capacity Weights		AC.1	AC.2	W
	AC.1	1	1.00	50.0%
	AC.2	1.00	1	50.0%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.4 Weights		CI.12	CI.13	CI.14	CI.15	CI.16	CI.17	CI.18	w
	CI.12	1	1.00	1.00	1.00	1.00	1.00	1.00	14.3%
	CI.13	1.00	1	1.00	1.00	1.00	1.00	1.00	14.3%
	CI.14	1.00	1.00	1	1.00	1.00	1.00	1.00	14.3%
	CI.15	1.00	1.00	1.00	1	1.00	1.00	1.00	14.3%
	CI.16	1.00	1.00	1.00	1.00	1	1.00	1.00	14.3%
	CI.17	1.00	1.00	1.00	1.00	1.00	1	1.00	14.3%
	CI.18	1.00	1.00	1.00	1.00	1.00	1.00	1	14.3%
	number of comparisons: 21								100%
	consistency ratio CR: 0.0%								

Expert 1 AC.1 Weights		AI.1	AI.2	AI.3	AI.4	AI.5	w
	AI.1	1	1.00	5.00	3.00	3.00	36.3%
	AI.2	1.00	1	5.00	2.00	0.50	22.5%
	AI.3	0.20	0.20	1	1.00	0.33	6.5%
	AI.4	0.33	0.50	1.00	1	0.20	8.0%
	AI.5	0.33	2.00	3.00	5.00	1	26.6%
	number of comparisons: 10						100%
	consistency ratio CR: 8.5%						

Expert 1 AC.2 Weights		AI.6	AI.2	AI.3	w
	AI.6	1	1.00	0.33	20.0%
	AI.7	1.00	1	0.33	20.0%
	AI.8	3.00	3.00	1	60.0%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 SC.1 Weights		SI.1	SI.2	SI.3	w
	SI.1	1	2.00	0.50	28.6%
	SI.2	0.50	1	0.25	14.3%
	SI.3	2.00	4.00	1	57.1%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 SC.2 Weights		SI.4	SI.5	SI.6	w
	SI.4	1	4.00	3.00	61.4%
	SI.5	0.25	1	0.33	11.7%
	SI.6	0.33	3.00	1	26.8%
	number of comparisons: 3				100%
	consistency ratio CR: 7.7%				

Table B.11 Expert 9 pairwise comparison calculations

Expert 1 Coping Capacity Weights		CC1	CC2	CC3	CC4	W
	CC1	1	2.00	0.33	1.00	20.3%
	CC2	0.50	1	0.33	2.00	17.1%
	CC3	3.00	3.00	1	3.00	48.5%
	CC4	1.00	0.50	0.33	1	14.1%
	number of comparisons: 6					100%
	consistency ratio CR: 6.8%					

Expert 1 Susceptibility Weights		SC.1	SC.2	SC.3	w
	SC.1	1	5.00	5.00	71.4%
	SC.2	0.20	1	1.00	14.3%
	SC.3	0.20	1.00	1	14.3%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 CC.1 Weights		CI.1	CI.2	W
	CI.1	1	1.00	50.0%
	CI.2	1.00	1	50.0%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.3 Weights		CI.10	CI.11	W
	CI.10	1	3.00	75.0%
	CI.11	0.33	1	25.0%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.2 Weights		CI.3	CI.4	CI.5	CI.6	CI.7	CI.8	CI.9	w
	CI.3	1	3.00	7.00	3.00	3.00	3.00	3.00	33.7%
	CI.4	0.33	1	7.00	5.00	3.00	3.00	3.00	25.6%
	CI.5	0.14	0.14	1	1.00	0.33	1.00	1.00	5.2%
	CI.6	0.33	0.20	1.00	1	0.33	1.00	1.00	6.3%
	CI.7	0.33	0.33	3.00	3.00	1	1.00	5.00	14.6%
	CI.8	0.33	0.33	1.00	1.00	1.00	1	1.00	8.0%
	CI.9	0.33	0.33	1.00	1.00	0.20	1.00	1	6.5%
	number of comparisons: 21								100%
	consistency ratio CR: 6.4%								

Expert 1 Adaptive Capacity Weights		AC.1	AC.2	W
	AC.1	1	2.00	66.7%
	AC.2	0.50	1	33.3%
	NoC: 1			100%
	CR: 0			

Expert 1 CC.4 Weights		CI.12	CI.13	CI.14	CI.15	CI.16	CI.17	CI.18	w
	CI.12	1	3.00	3.00	5.00	5.00	6.00	6.00	38.6%
	CI.13	0.33	1	1.00	3.00	3.00	5.00	5.00	20.4%
	CI.14	0.33	1.00	1	1.00	2.00	3.00	1.00	11.7%
	CI.15	0.20	0.33	1.00	1	3.00	3.00	1.00	10.3%
	CI.16	0.20	0.33	0.50	0.33	1	4.00	2.00	8.0%
	CI.17	0.17	0.20	0.33	0.33	0.25	1	0.25	3.3%
	CI.18	0.17	0.20	1.00	1.00	0.50	4.00	1	7.6%
	number of comparisons: 21								100%
	consistency ratio CR: 7.0%								

Expert 1 AC.1 Weights		AI.1	AI.2	AI.3	AI.4	AI.5	w
	AI.1	1	1.00	5.00	1.00	1.00	21.3%
	AI.2	1.00	1	7.00	5.00	1.00	35.5%
	AI.3	0.20	0.14	1	0.14	0.14	3.5%
	AI.4	1.00	0.20	7.00	1	1.00	17.3%
	AI.5	1.00	1.00	7.00	1.00	1	22.6%
	number of comparisons: 10						100%
	consistency ratio CR: 7.8%						

Expert 1 AC.2 Weights		AI.6	AI.2	AI.3	w
	AI.6	1	3.00	3.00	60.0%
	AI.7	0.33	1	1.00	20.0%
	AI.8	0.33	1.00	1	20.0%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 SC.1 Weights		SI.1	SI.2	SI.3	w
	SI.1	1	3.00	3.00	60.0%
	SI.2	0.33	1	1.00	20.0%
	SI.3	0.33	1.00	1	20.0%
	number of comparisons: 3				100%
	consistency ratio CR: 0.0%				

Expert 1 SC.2 Weights		SI.4	SI.5	SI.6	w
	SI.4	1	7.00	5.00	74.7%
	SI.5	0.14	1	1.00	11.9%
	SI.6	0.20	1.00	1	13.4%
	number of comparisons: 3				100%
	consistency ratio CR: 1.3%				

Table B.12 Susceptibility calculations of the Bağpınar heritage properties

| | susceptibility | | |

Table B.13 Coping capacity calculations of the Bağpınar heritage properties

inventory no	Coping Capacity																									overall score
	CC.1				CC.2									CC.3				CC.4								
	CI.1	CI.2	total	score	CI.3	CI.4	CI.5	CI.6	CI.7	CI.8	CI.9	total	score	CI.10	C.I11	total	score	CI.12	CI.13	CI.14	CI.15	CI.16	CI.17	CI.18	total	score	
S1	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
S2	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
S3	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
S4	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
S5	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
S6	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
S7	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
S8	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
S9	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
N1	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
N2	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
N3	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
N4	0	0,5	0,36	**0,108**	0	0,85	0,5	0,5	0	0	0	0,333	**0,083**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,27**
N5	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
N6	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
N7	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
N8	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
N9	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
N10	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
N11	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
N12	0	0,5	0,36	**0,108**	0	0,85	0,5	0,5	0	0	0	0,333	**0,083**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,27**
N13	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
N14	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
N15	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
N16	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
N17	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
N18	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
N19	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
N20	0	0,5	0,36	**0,108**	0	0,85	0,5	0,5	0	0	0	0,333	**0,083**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,27**
N21	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
N22	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
field/garden	0	0,5	0,36	**0,108**	0	0	0	0	0	0	0	0	**0**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,19**
square	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
fountain	0	0,5	0,36	**0,108**	0	1	0,5	0,5	0	0	0	0,375	**0,094**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,28**
cemetry	0	0,5	0,36	**0,108**	0	1	0,5	0,5	0	0	0	0,375	**0,094**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,28**
street	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
bridge	0	0,5	0,36	**0,108**	0	1	0,5	0,5	0	0	0	0,375	**0,094**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,28**
oven	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
dovecote	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
barn/hayloft	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**
mosque	0	0,5	0,36	**0,108**	0	1	0,5	0,5	0	0	0	0,375	**0,094**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,28**
beşaretkaya	0	0,5	0,36	**0,108**	0	1	0,5	0,5	0	0	0	0,375	**0,094**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,28**
school	0	0,5	0,36	**0,108**	0	1	0,5	0,5	0	0	0	0,375	**0,094**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,28**
shop	0	0,5	0,36	**0,108**	0	0,45	0,5	0,5	0	0	0	0,221	**0,055**	0,5	0	0,25	**0,078**	0	0	0	0	0	0	0	0	**0**	**0,24**

Table B.14 Adaptive capacity calculations of the Bağpınar heritage properties

inventory no	adaptive capacity																														
	AC.1											AC.2																			
	AI.1	AI.2					AI.3	AI.4	AI.5	total	score	AI.6								AI.7	AI.8							total	score	overall score
		stone	wood	soil	iron	total						water	electricity	heating	telecom.	sewage	waste	average			primary s	health	socio-cul	employe	shopping	average			
S1	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
S2	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
S3	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
S4	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
S5	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
S6	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
S7	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
S8	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
S9	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N1	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N2	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N3	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N4	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N5	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N6	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N7	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N8	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N9	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N10	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N11	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N12	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N13	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N14	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N15	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N16	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N17	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N18	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N19	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N20	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N21	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
N22	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
field/garden	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0	0,422	**0,24**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,512**
square	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
fountain	0,85	0,5	0,5	1	0,5	0,575	0,33	0	1	0,632	**0,36**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,632**
cemetry	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,66	0,56	**0,319**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,591**
street	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0	0,422	**0,24**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,512**
bridge	0,85	0,5	0,5	1	0,5	0,575	0,33	0	1	0,632	**0,36**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,632**
oven	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
dovecote	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,66	0,56	**0,319**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,591**
barn/hayloft	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**
mosque	0,85	0,5	0,5	1	0,5	0,575	0,33	0	1	0,632	**0,36**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,632**
beşaretkaya	0,85	0,5	0,5	1	0,5	0,575	0,33	0	1	0,632	**0,36**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,632**
school	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,66	0,56	**0,319**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,591**
shop	0,85	0,5	0,5	1	0,5	0,575	0,33	0	0,33	0,491	**0,28**	1	1	0	1	1	1	0,833	0,75	0	0,5	0,5	0,5	0	0,3	0,633	**0,272**	**0,552**

Table B.15 Vulnerability results of the Bağpınar heritage properties

	susceptibility	coping capacity	adaptive capacity	capacity (CCx AC)	vulnerability
S1	0.825	0.241	0.552	0.133	6.207
S2	0.331	0.241	0.552	0.133	2.493
S3	0.265	0.241	0.552	0.133	1.998
S4	0.364	0.241	0.552	0.133	2.739
S5	0.337	0.241	0.552	0.133	2.540
S6	0.357	0.241	0.552	0.133	2.688
S7	0.877	0.241	0.552	0.133	6.602
S8	0.810	0.241	0.552	0.133	6.094
S9	0.380	0.241	0.552	0.133	2.862
N1	0.396	0.241	0.552	0.133	2.984
N2	0.817	0.241	0.552	0.133	6.150
N3	0.870	0.241	0.552	0.133	6.545
N4	0.370	0.269	0.552	0.148	2.495
N5	0.545	0.241	0.552	0.133	4.102
N6	0.406	0.241	0.552	0.133	3.058
N7	0.239	0.241	0.552	0.133	1.802
N8	0.374	0.241	0.552	0.133	2.812
N9	0.897	0.241	0.552	0.133	6.750
N10	0.413	0.241	0.552	0.133	3.107
N11	0.278	0.241	0.552	0.133	2.092
N12	0.785	0.269	0.552	0.148	5.294
N13	0.268	0.241	0.552	0.133	2.020
N14	0.269	0.241	0.552	0.133	2.023
N15	0.301	0.241	0.552	0.133	2.269
N16	0.301	0.241	0.552	0.133	2.267
N17	0.337	0.241	0.552	0.133	2.538
N18	0.265	0.241	0.552	0.133	1.998
N19	0.239	0.241	0.552	0.133	1.800
N20	0.792	0.269	0.552	0.148	5.339
N21	0.279	0.241	0.552	0.133	2.097
N22	0.746	0.241	0.552	0.133	5.614
field/garden	0.100	0.186	0.512	0.095	1.057
square	0.000	0.241	0.552	0.133	0.000
fountain	0.529	0.279	0.632	0.176	2.997
cemetry	0.000	0.279	0.591	0.165	0.000
street	0.158	0.241	0.512	0.123	1.277
bridge	0.158	0.279	0.632	0.176	0.892
oven	0.788	0.241	0.552	0.133	5.933
dovecote	0.634	0.241	0.591	0.142	4.453
barn/hayloft	0.438	0.241	0.552	0.133	3.298
mosque	0.135	0.279	0.632	0.176	0.766
beşaretkaya	0.828	0.279	0.632	0.176	4.689
school	0.482	0.279	0.591	0.165	2.917
shop	0.790	0.241	0.552	0.133	5.943

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2008 – 2013	B.Sc., Architecture, İstanbul Technical University, Istanbul, TURKEY
2013 – 2015	M.Sc., Architecture, Restoration, İstanbul Technical University, Istanbul, TURKEY
2016 – 2017	Research Assistant, Architecture, Nuh Naci Yazgan University, Kayseri, TURKEY
2018	Doctoral Candidate, Architecture, Abdullah Gül University, Kayseri, TURKEY
2018 – 2020	Research Assistant, Architecture, Abdullah Gül University, Kayseri, TURKEY
2020 – Present	Lecturer, Architecture, Abdullah Gül University, Kayseri, TURKEY

SELECTED PUBLICATIONS AND PRESENTATIONS

J1) Elagöz Timur, B. ve Asiliskender, B. 2024. An Evaluation of the Rural Landscapes as Heritage from Habitus Perspective, *Millî Folklor* 141 (Spring 2024): 167-178.

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C4) Elagöz Timur, B. ve diğerleri. 2018. “Gesi Vadisi Üzerinden Kültürel Sürekliliğin Belgelenmesi ve Değerlendirilmesi; Kayseri Mancusun (Yeşilyurt) Mahallesi”, Türkiye Kentsel Morfoloji Çalışma Ağı, II. Kentsel Morfoloji Sempozyumu, 651-662, 31 Ekim – 2 Kasım, İstanbul.