

# FROM DISASTER TO SUSTAINABILITY: ARCHITECTURE, LANDSCAPE AND LIFE

## THE DISASTER OF THE CENTURY

### TURKEY-SYRIA EARTHQUAKE

6 FEBRUARY 2023 | 4:17 PM (GMT+3)

"An earthquake's shock waves can be a wake-up call for humanity to pay attention to our planet's health."

– Jane Goodall

In this earthquake, more than **214,000 buildings** in the earthquake-affected areas completely collapsed.

The damages resulting from the 2023 earthquake were estimated at US\$**148.8 billion in Turkey**, equivalent to nine percent of the country's GDP, and US\$**14.8 billion in Syria**.

The earthquake inflicted extensive damages and losses in an area of approximately **350,000 km<sup>2</sup>**, encompassing **44% of Turkey's territory** (approximately twelve times the size of Belgium) in size.

More than **14 million people in 11 provinces** of Turkey, equivalent to **16%** of Turkey's population, along with **four provinces** in Syria, were affected by this earthquake, and **3.5 million people were displaced**.

In total, **7,259 Syrians**, including **2,153 children** and **1,524 women**, lost their lives due to the Turkey-Syria earthquake: 2,534 individuals died in non-regime territories, 394 in regime territories, and **4,331 were Syrians displaced by war and residing in the city of Gaziantep, Turkey**.

This earthquake, with **over 50,000 fatalities**, has been the **deadliest natural disaster in modern Turkish history**.



## Global Crisis

2023 Türkiye -Syria quake: Nature's wrath, etched in devastation and grief.

The project Natural Disaster, Landscape Architecture, and Revitalization of Life (2023 Turkey Earthquake Experience) was selected as the representative of the University of Tehran for the Ribas Piera Prize based on a rigorous academic evaluation process conducted within the Departments of Landscape Architecture, Environmental Design, and Urban Planning. Over a two-year period, the project was collaboratively developed by three student teams under joint faculty supervision, forming a cohesive interdisciplinary effort that reflects academic depth and real-world relevance. The selection was guided by several core criteria: 1. Conceptual Quality: The project presents a compelling theoretical framework that addresses post-disaster recovery through nature-based infrastructure (NBI), integrating ecological and social systems in a balanced and thoughtful manner. 2. Thematic Relevance: Given the increasing frequency and impact of climate-related disasters, the project's focus on the 2023 Turkey earthquake offers timely and globally significant insights into disaster-responsive landscape architecture. 3. Innovation: The proposal introduces novel design strategies—such as the use of super adobe, multifunctional ecological spaces, and community-based renewable energy solutions—demonstrating advanced problem-solving and creativity. 4. Technical Resolution: Site planning, structural details, and resource management systems were developed to a high level of technical maturity, supported by both theoretical research and local data analysis.



GLOBAL NECESSITY BACKGROUND

Earth's Beat: Human,Nature,Built Environments

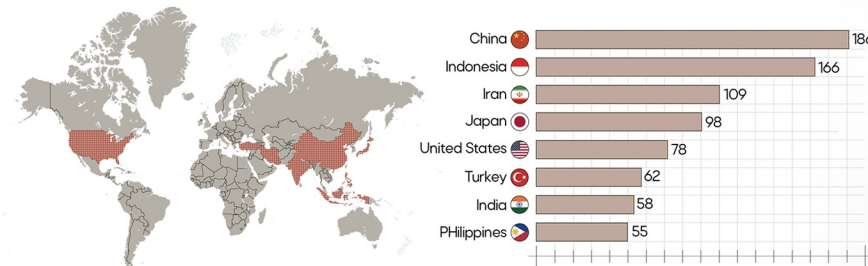
Examining the past 100 years, the influential role of earthquakes on Earth and humanity emerges as a crucial global concern.

Earthquakes, as formidable geological events, have left a lasting impact on societies worldwide over the past century. These seismic occurrences, with their potential for significant destruction and loss of life, underscore the urgent need for understanding and preparedness in the face of natural disasters.

"The power of the natural world should never be underestimated." – David Attenborough

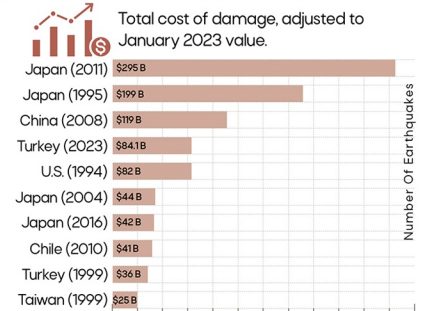
The countries hit by the most earthquakes

Countries with the highest number of major earthquakes between 1990 and 2024

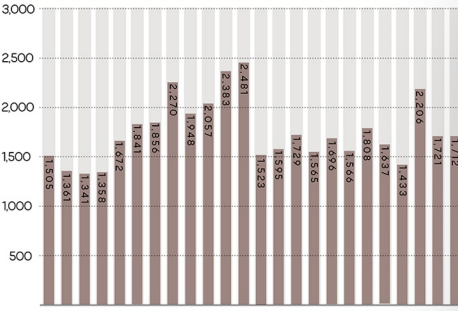


"Earthquakes serve as a reminder of the need to work together to build resilient communities." – Ban Ki-moon

The most expensive earthquakes in the last 30 years



Development of the number of earthquakes (M5+) worldwide from 2000 to 2023



"Nature is Our Greatest Teacher." – Dr. Jane Goodall

Post-Earthquake Crises Management

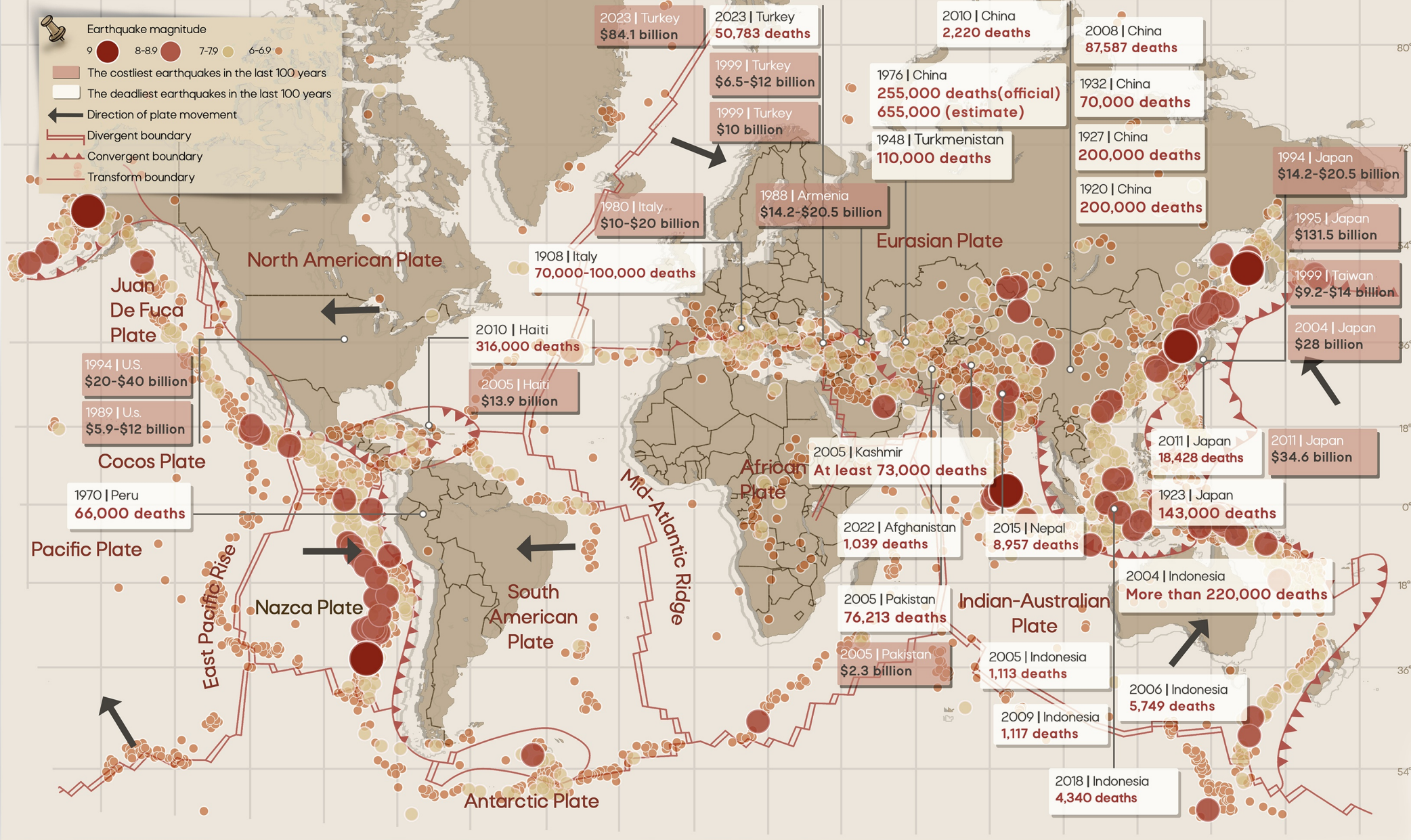
- 1 Emergency response planning
- 2 Emergency medical response
- 3 Shelter and housing assistance
- 4 Infrastructure assessment and repair
- 5 Psychological support and counseling
- 6 Resilience & economic recovery

- SUSTAINABLE DEVELOPMENT
- REVITALIZATION OF LIFE
- NBI



EARTHQUAKE RISK: A GLOBAL VIEW

This map emphasizes the critical need for a comprehensive understanding of global earthquake risk to enhance preparedness and resilience against natural disasters in communities.



Global Background

Tremors of Transformation: Exploring the Global Significance of Earthquakes in a Changing World.

Country/City

Iran, Tehran

University / School

University of Tehran / School of Architecture, Urban Planning and Environment

Academic year

2023-2024

Title of the project

Natural Disaster, Landscape Architecture and Revitalization of Life (2023 Turkey Earthquake Experience)

Authors

Reza Farhadi, Maryam Noroozi





Title of the project	Natural Disaster, Landscape Architecture and Revitalization of Life (2023 Turkey Earthquake Experience)
Authors	Reza Farhadi, Maryam Noroozi
Title of the course	Landscape architecture planning and design studio
Academic year	2023-2024
Teaching Staff	Dr. Ahmad Pourahmad, Dr. Mahdi Khansefid
Department / Section / Program of belonging	Landscape Architecture, Environmental Design and Urban Planning
University / School	University of Tehran / School of Architecture, Urban Planning and Environment

Written statement, short description of the project in English, no more than 250 words

**Project Statement:** The catastrophic earthquakes that struck Turkey and Syria in February 2023, with magnitudes of 7.8 and 7.6, caused immense devastation over 59,000 lives lost, widespread displacement, and extensive urban destruction, particularly in Gaziantep. Amid the tragedy lies a chance to rebuild in a way that prioritizes resilience, sustainability, and equity. This project explores post-disaster revitalization through Nature-Based Infrastructure (NBI) strategies, addressing refuge, health, social, economic, and infrastructural needs. **Project Narrative:** We apply the global concept of NBI to transform Gaziantep's recovery into an ecologically and socially integrated process. Through art, science, and ecological planning, the project aligns with biological and social systems to restore both community and environment. **Site Selection:**The proposed temporary settlement spans 22,871 km² on Gaziantep's southeast and west peripheries, strategically located near major city roads for accessibility and relief distribution. **Global Strategies:** *1. Coexistence with Nature:* Using super adobe and local materials, the project involves all community members. Animal shelters and waste recycling support local agriculture and environmental health. *2. Continuity of Life:* Designated multifunctional spaces balance human and ecological needs, supporting psychological well-being and biodiversity. *3. Livelihood Restoration:* Green infrastructure preserves natural resources, while economic crops and water reuse systems stimulate local industries and sustainable livelihoods. *4. Embracing Green Energy:* The project prioritizes solar and wind power, fostering a visually and functionally sustainable identity for post-earthquake communities.

Barcelona International Landscape Biennial

Contact via email:  
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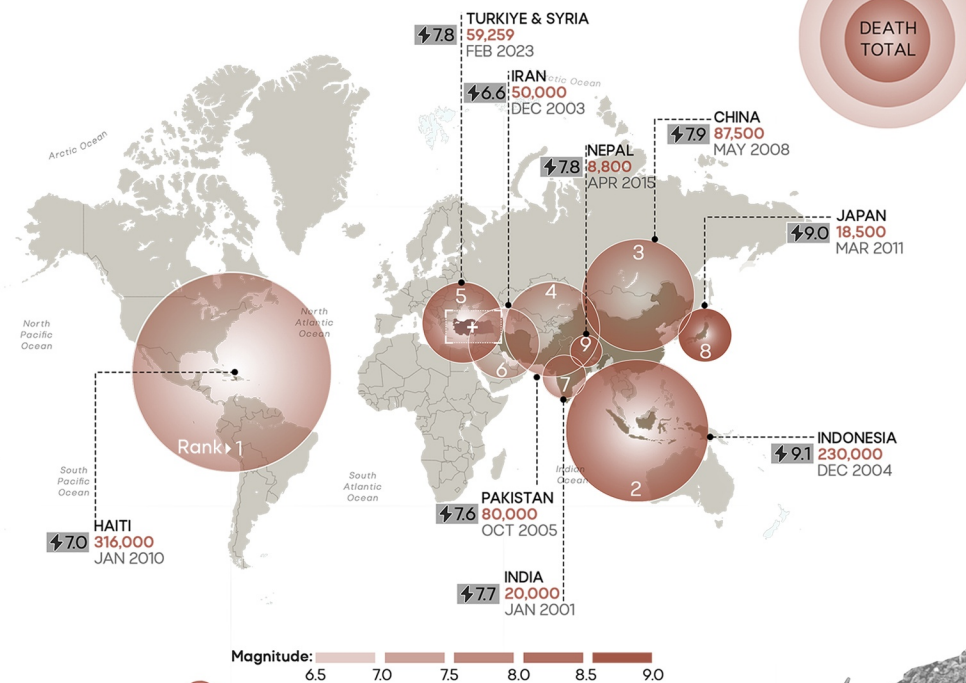
Venue:  
COAC - Col·legi Oficial d'Arquitectes de Catalunya  
Carrer Arcs 1-3, 08002 Barcelona - Spain



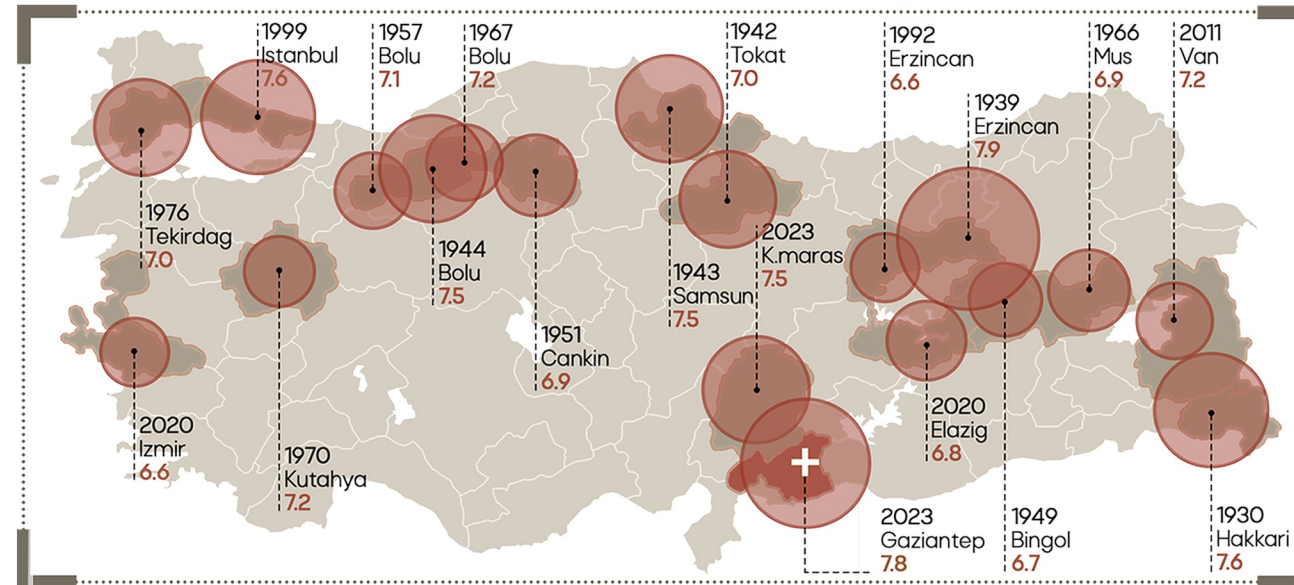
## TIMELINE

### DEADLIEST EARTHQUAKES Of the 21st Century

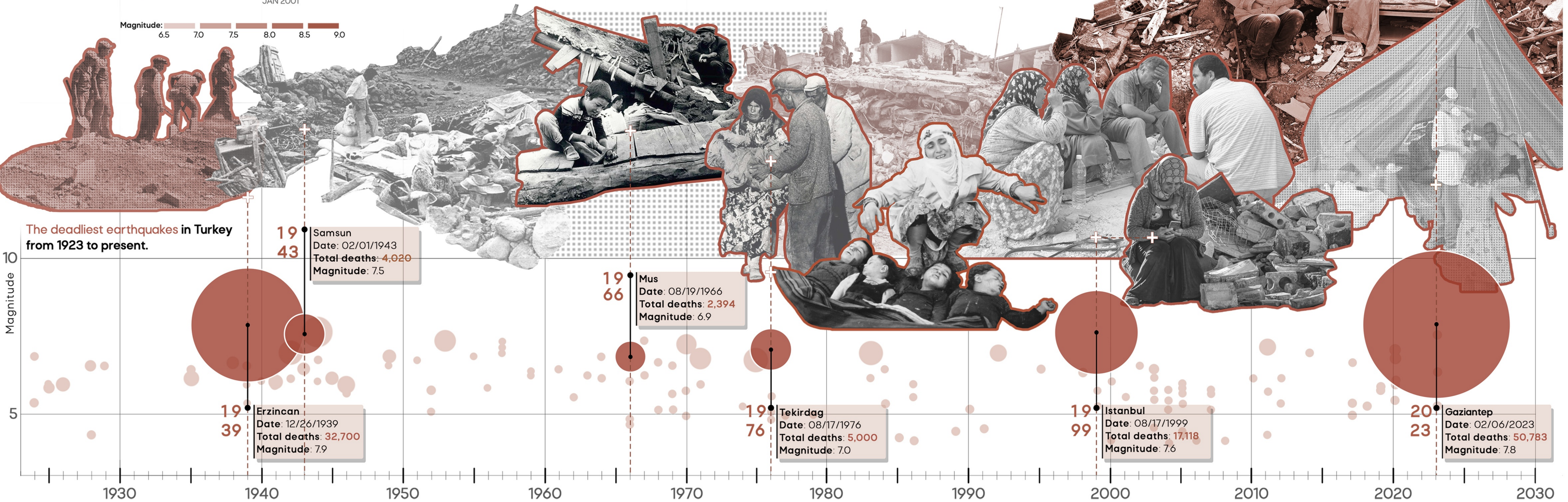
Aside from its high death toll, the 2023 earthquake on the border of Turkey and Syria left close to **1.5 million** without homes. Additionally, about **14.5 million** Turks and **2 million** Syrians were also displaced.



## Earthquakes of magnitude 6 or above rocked Turkey over last 100 years.



Over the past 23 years, **58 earthquakes** have resulted in more than 100 fatalities each, highlighting nature's power and prompting reflection on the transient nature of human life and our relationship with Earth's relentless forces.



## Historical Analysis

A Century of Seismic Shaking: Historical Analysis of Earthquakes and Their Vulnerability in Türkiye (1923-present).

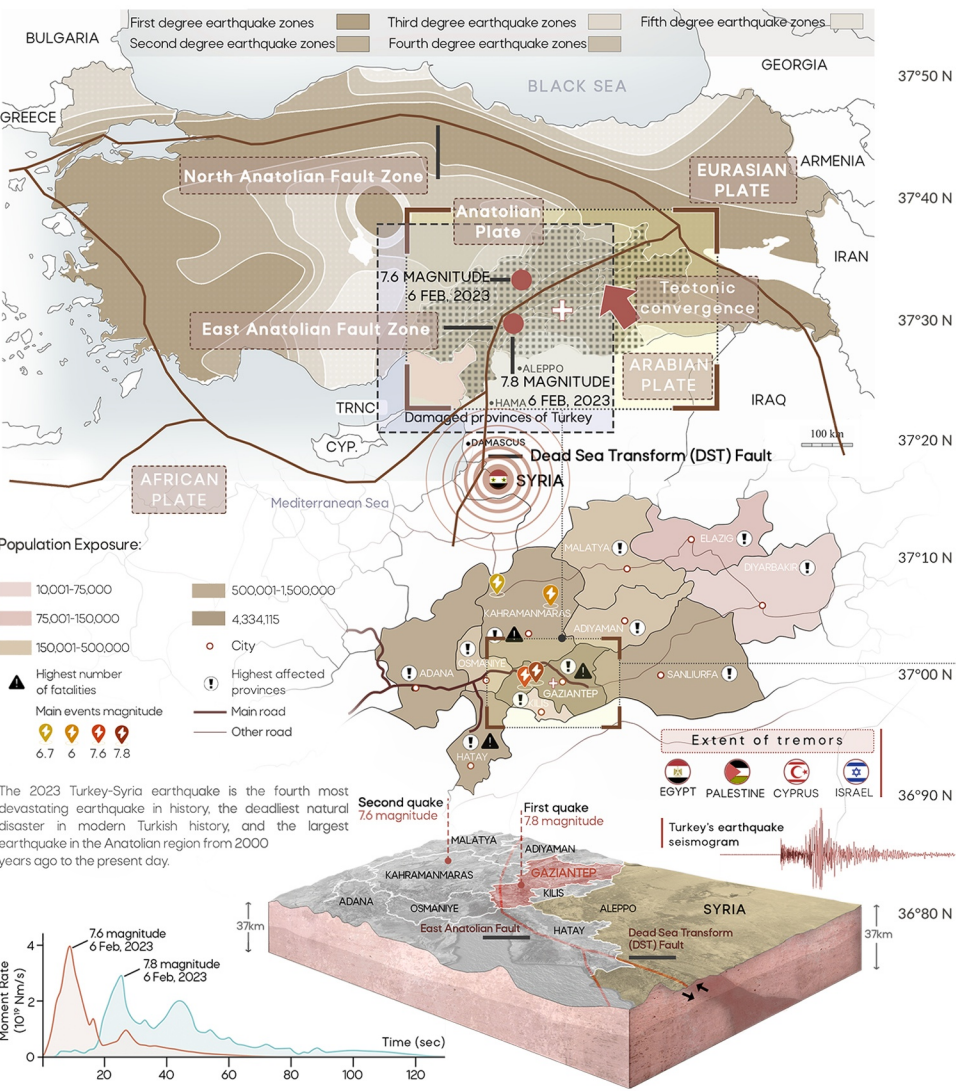


ANALYSIS OF SITE LOCATION AND CONTEXT

ANALYSIS AND EXPLORATION OF THE SEISMIC IMPACTS OF THE 2023 TURKEY-SYRIA EARTHQUAKE

At 4:17 a.m. on 6 February 2023, a 7.8 magnitude earthquake struck close to Gaziantep city in southern Turkey ( The most powerful earthquake recorded in the country since 1939). A second earthquake with a magnitude of 7.6 occurred some nine hours later, with its epicentre only around 70 kilometres from the first earthquake, near Ekinozu city in Kahramanmaraş province.

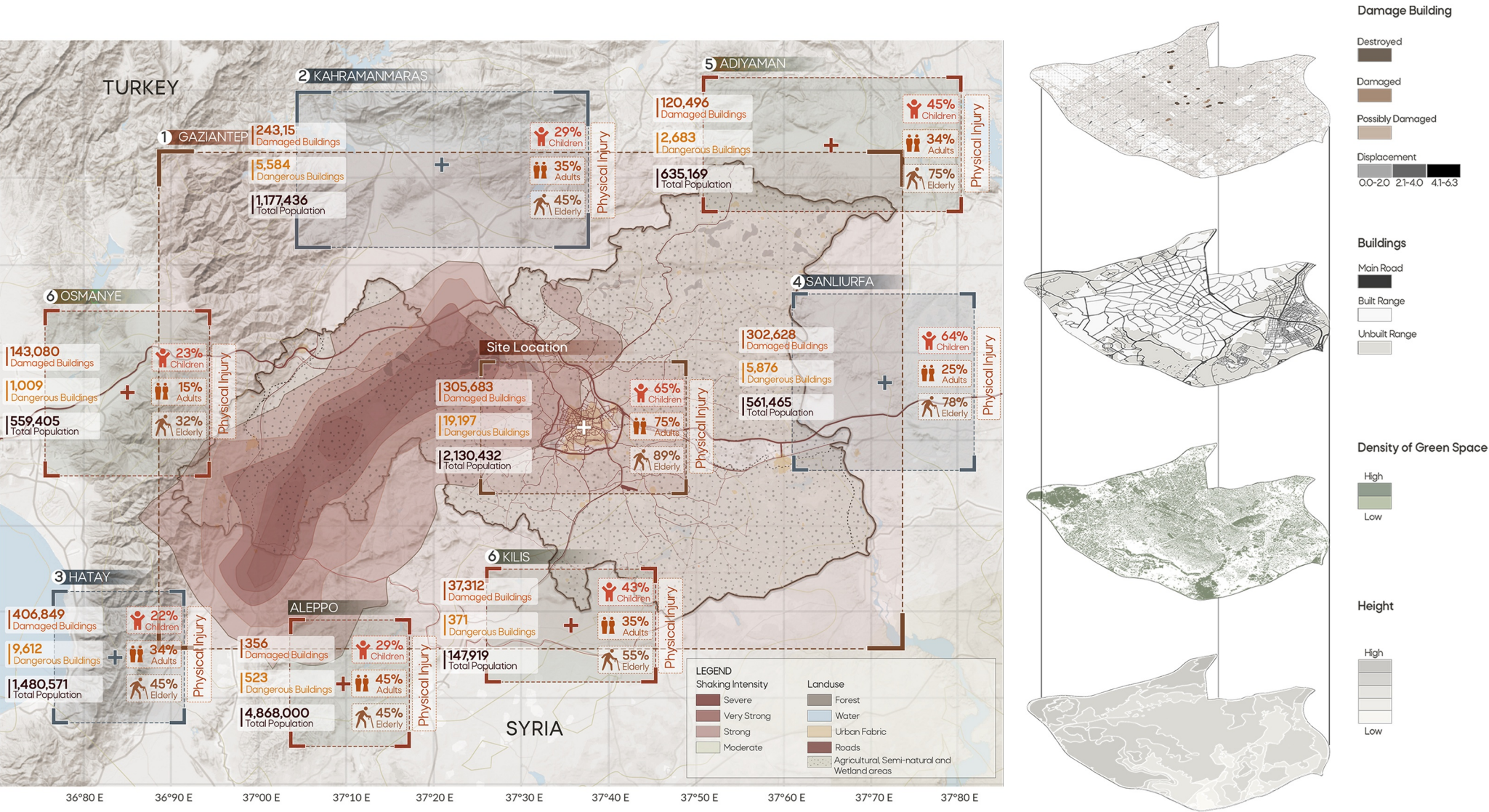
Turkey earthquake map



Regional Impact Assessment: 2023 Earthquake Devastation Map in Turkey & Syria Provinces

The seismic event of 2023 in Turkey and Syria resulted in widespread devastation across multiple cities in both countries, highlighting the interconnectedness of seismic activity and its impact on regional infrastructure, socio-economic structures, and humanitarian concerns.

The earthquake had the most significant impact in Turkey, particularly in the provinces of **Gaziantep**, **Hatay**, **Osmaniye**, **Kahramanmaraş**, **Kilis**, **Adiyaman**, **Sanliurfa**, and in Syria in the **Aleppo** Province.





STATUS ANALYSIS

»»»

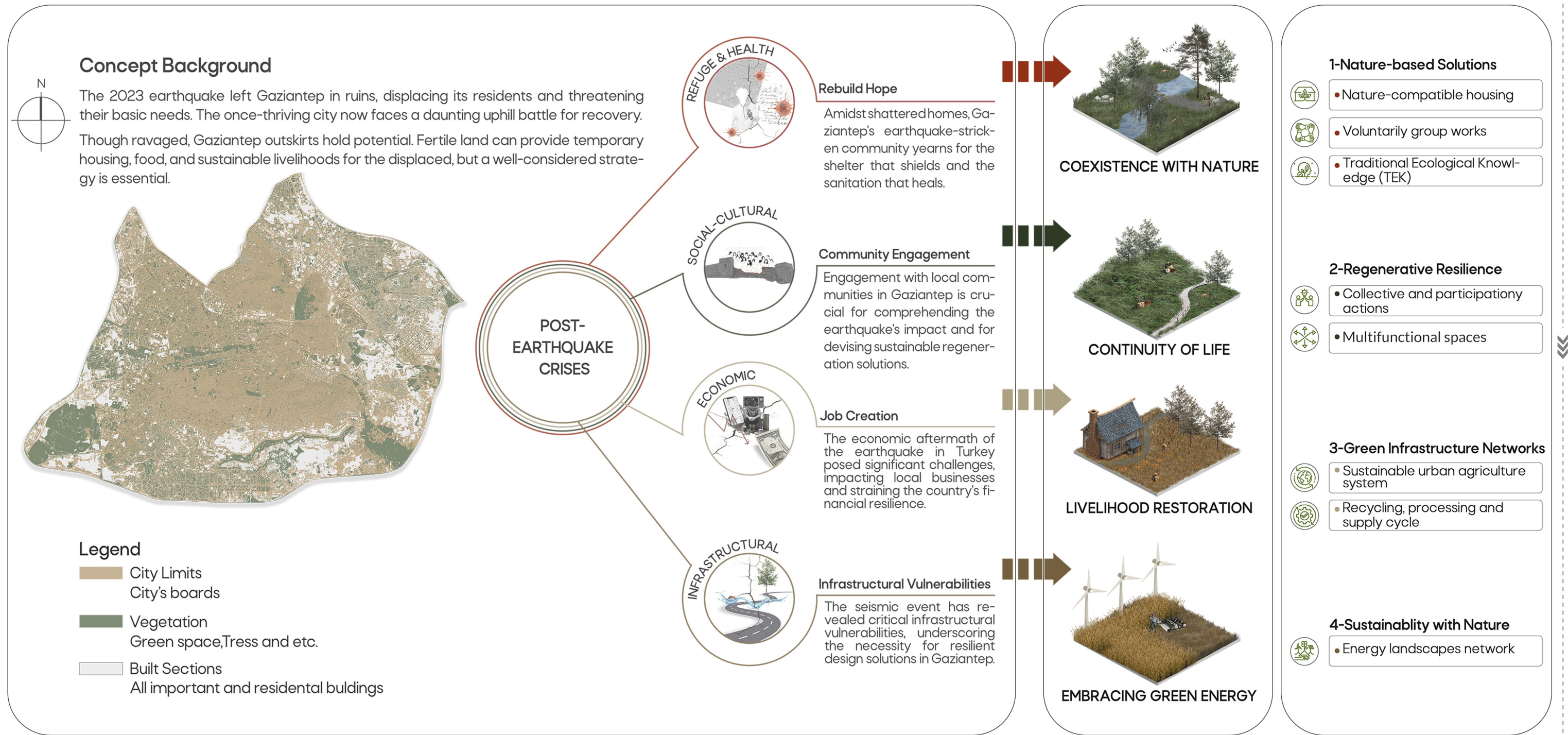
MAIN CHALLENGES

»»»

GLOBAL STRATEGIES

»»»

NBI SOLUTIONS







COEXISTENCE WITH NATURE  
Nature based solutions

NBS offers a harmonious approach to coexistence with nature, where human well-being and environmental protection go hand in hand. Through voluntary group work, nature-compatible housing, and traditional ecological knowledge, communities can create a nature-aligned approach that provides shelter, health, and environmental preservation for earthquake-stricken communities.



*"Now is the time for urgent action. Nature underpins our very existence and livelihoods and is integral to the effective functioning and well-being of urban communities."*  
(Valérie Plante, Mayor Montreal )



CONTINUITY OF LIFE  
Regenerative resilience

Through collective actions and nature-aligned initiatives, the community embarked on a journey of revitalization, transforming the earthquake-shattered landscape into a vibrant tapestry of resilience and sustainability. Multifunctional spaces, seamlessly integrated into the urban fabric, served as beacons of hope, providing not only shelter and sustenance but also fostering a sense of unity and shared purpose.



*Teamwork requires some sacrifice up front; people who work as a team have to put the collective needs of the group ahead of their individual interests.* (Patrick Lencioni, Pioneer of the Organizational Health Movement)



LIVELIHOOD RESTORATION  
Green infrastructure networks

The Gaziantep community's journey towards sustainable urban agriculture and processing serves as a powerful testament to the transformative power of nature based infrastructures. Their story highlights the crucial role of green infrastructure in fostering economic resilience and environmental sustainability. This demonstrates that even after disasters, communities can cultivate a path toward a brighter, more sustainable future.



*In a regenerative world, the governing metaphor for the human relationship with nature should be "global garden."*  
(John T. Lyle, Landscape Architect)



EMBRACING GREEN ENERGY  
Sustainability with nature

In the aftermath of the earthquake, the Gaziantep community faced the daunting task of rebuilding not only their physical infrastructure but also their energy systems. Amidst the ruins, a vision emerged: a vision of a green, resilient future powered by renewable energy sources.



*Since nature has the most sustainable ecosystem and since ultimately agriculture comes out of nature, our standard for a sustainable world should be nature's own ecosystem.* (Wes Jackson, Ecologist)



Nature: The Cause and the Remedy  
To tackle natural extremes, we need all hands that contribute.

Country/City	Iran, Tehran
University / School	University of Tehran / School of Architecture, Urban Planning and Environment
Academic year	2023-2024
Title of the project	Natural Disaster, Landscape Architecture and Revitalization of Life (2023 Turkey Earthquake Experience)
Authors	Amir Rahsaz, Hengameh Ghasemi

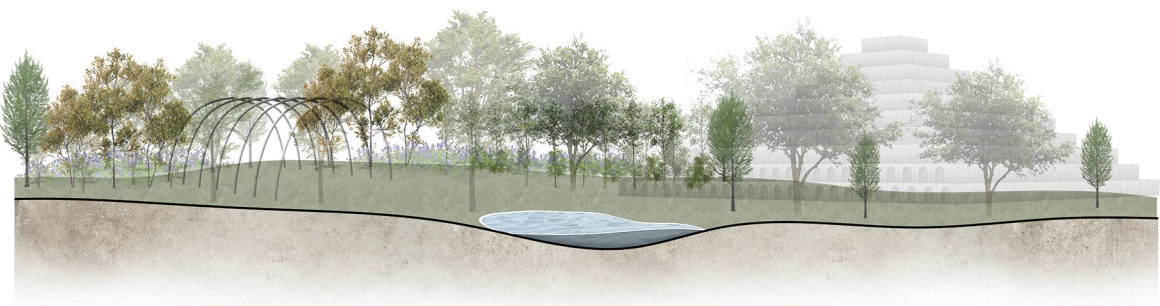


# SCENARIO AND OVERALL FRAMEWORK OF SITE PLANNING

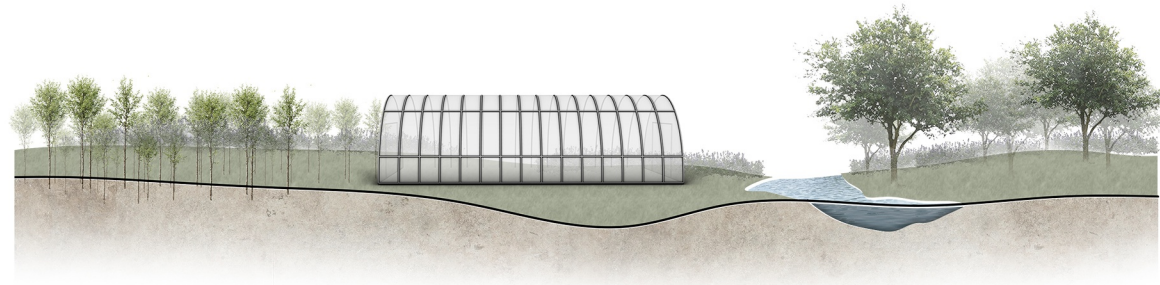
## COEXISTENCE WITH NATURE



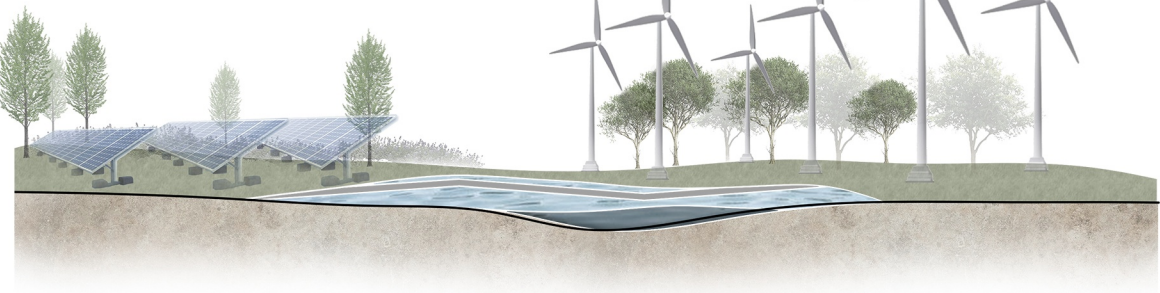
## CONTINUITY OF LIFE



## LIVELIHOOD RESTORATION



## EMBRACING GREEN ENERGY



### Green patches and ecological corridors



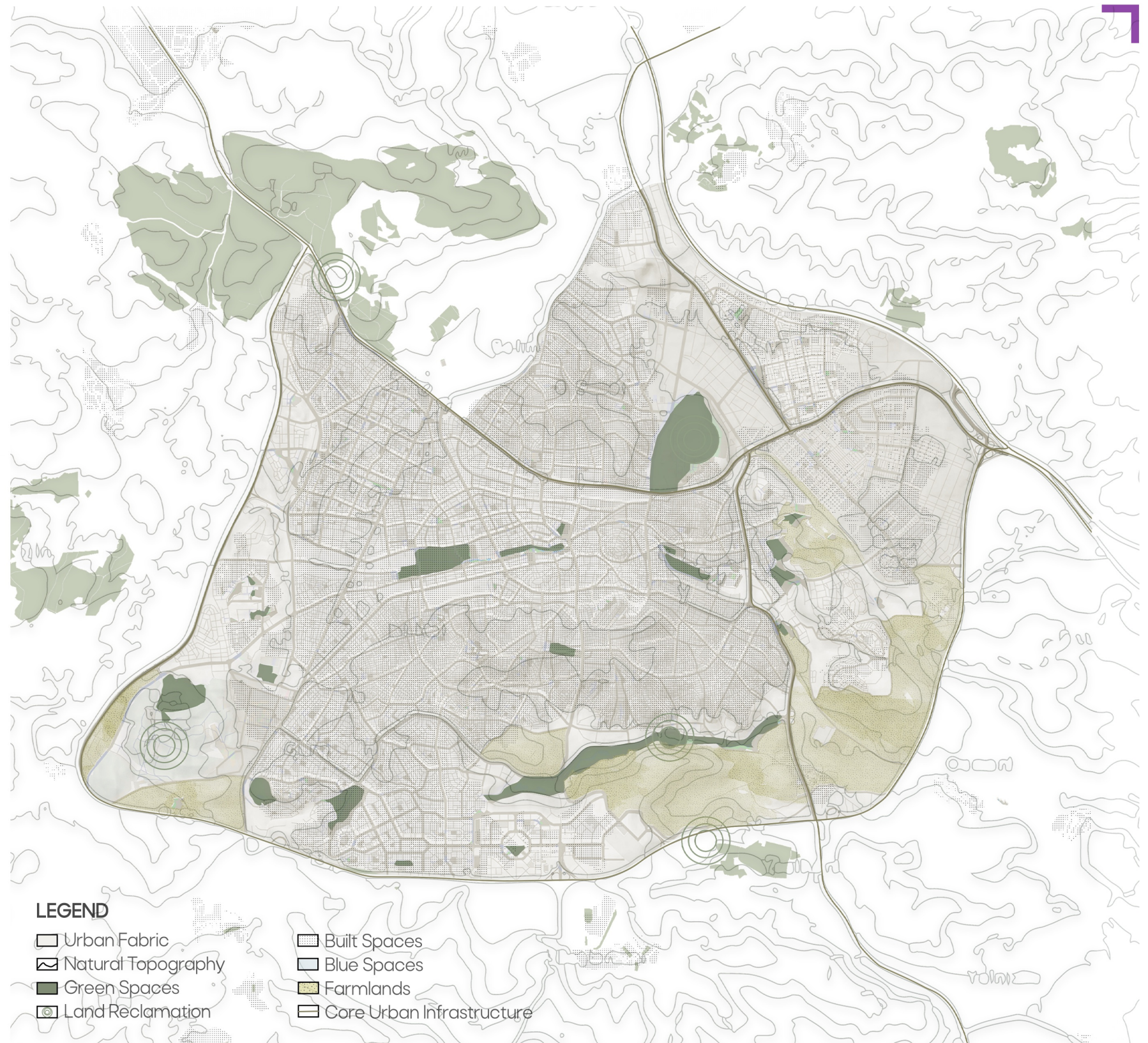
### Revitalizing landmarks



### New town(compatible with nature)



### Green industry district



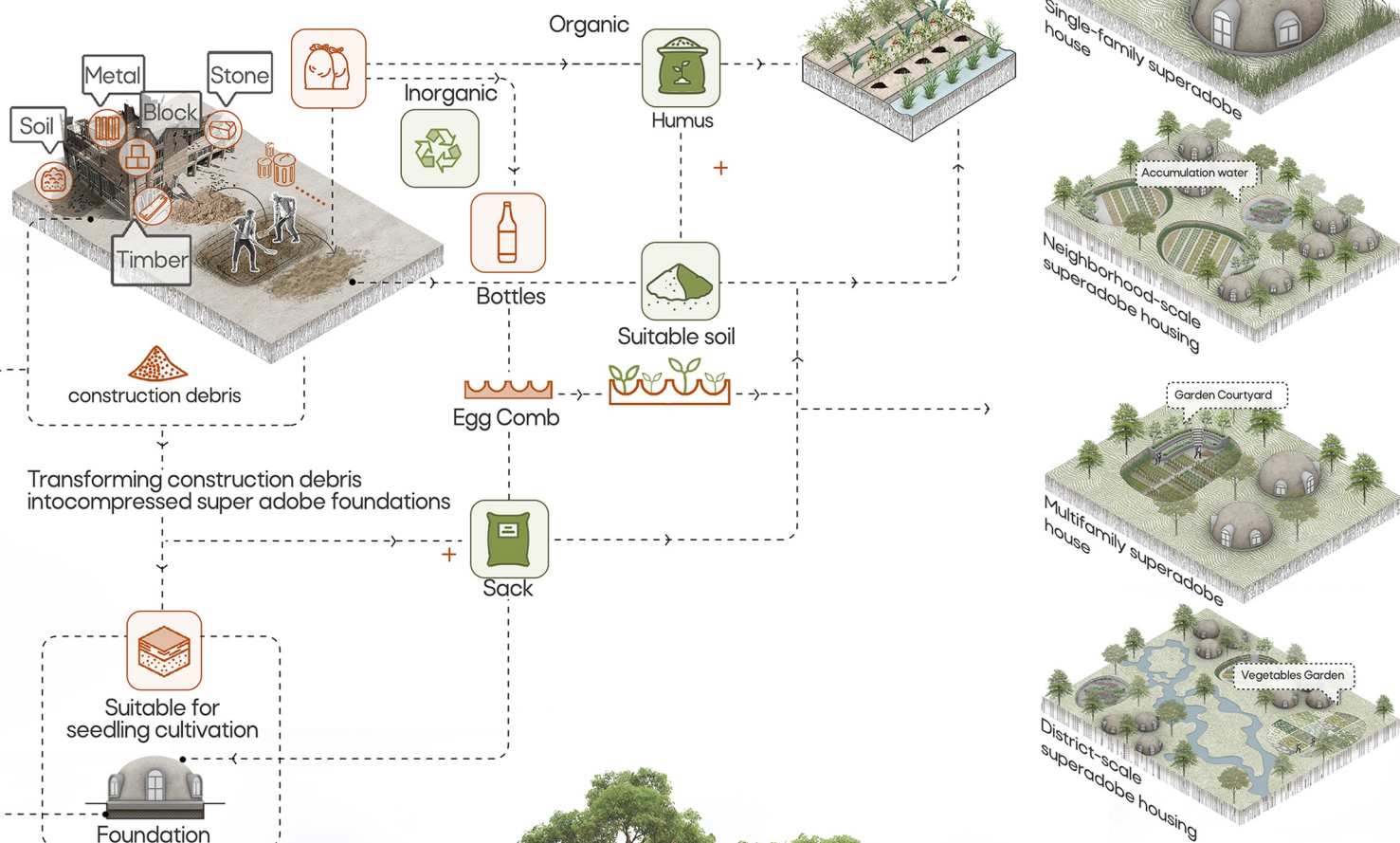
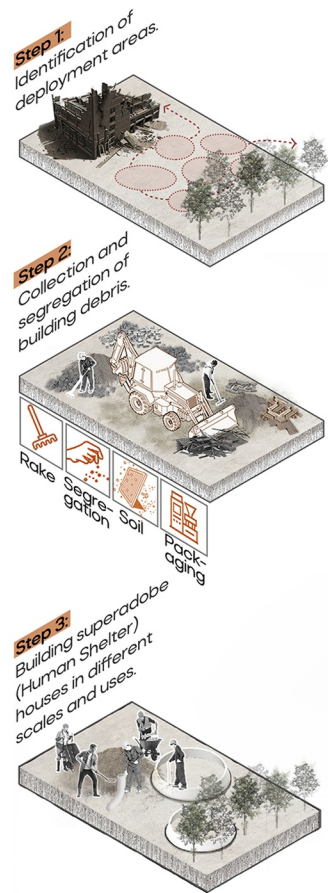


# GLOBAL STRATEGY I: COEXISTENCE WITH NATURE-BASED SOLUTIONS FOR REFUGE AND HEALTH CHALLENGES IN EARTHQUAKE-AFFECTED COMMUNITIES

## PHASE 1: ECO-FRIENDLY HOMES CONSTRUCTION

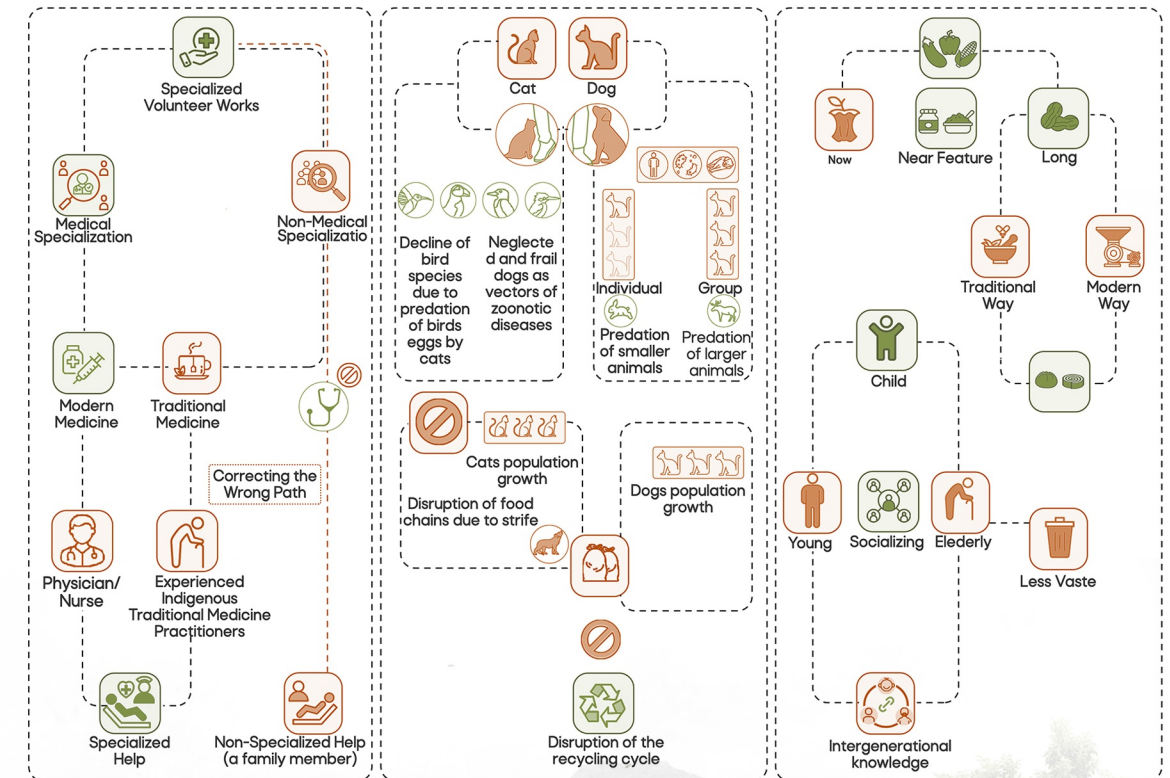
Post-Earthquake Emergency Housing Preparation Process

The pattern emergency housing:  
A sustainable and resilient framework for future disasters



## PHASE 2: VOLUNTARILY GROUP WORKS

Three catalytic role of volunteer groups in post-earthquake recovery:  
Addressing immediate needs, providing emotional support, and facilitating reconstruction



## PHASE 3: TRADITIONAL ECOLOGICAL KNOWLEDGE (TEK)

Harnessing indigenous wisdom for earthquake resilience: integrating TEK for effective and sustainable recovery



Implementation Timeline 2023

Sustainable post-disaster shelters

Ecological Harmony

Garden courtyard plot for nurturing vegetables seedlings and tree saplings

Cultivating Community Resilience

Harnessing nature's bounty: Utilizing native plants for sustainable wetland construction

Nature-Engineered Wetland FDHN

Constructed wetland with runoff for water purification and ecosystem Services

Empowering homeless dogs for therapy, international search and rescue missions

Canine Companions for Healing  
Global Search and Rescue Partners

Science\_Engineering

JAN

FEB

MAR

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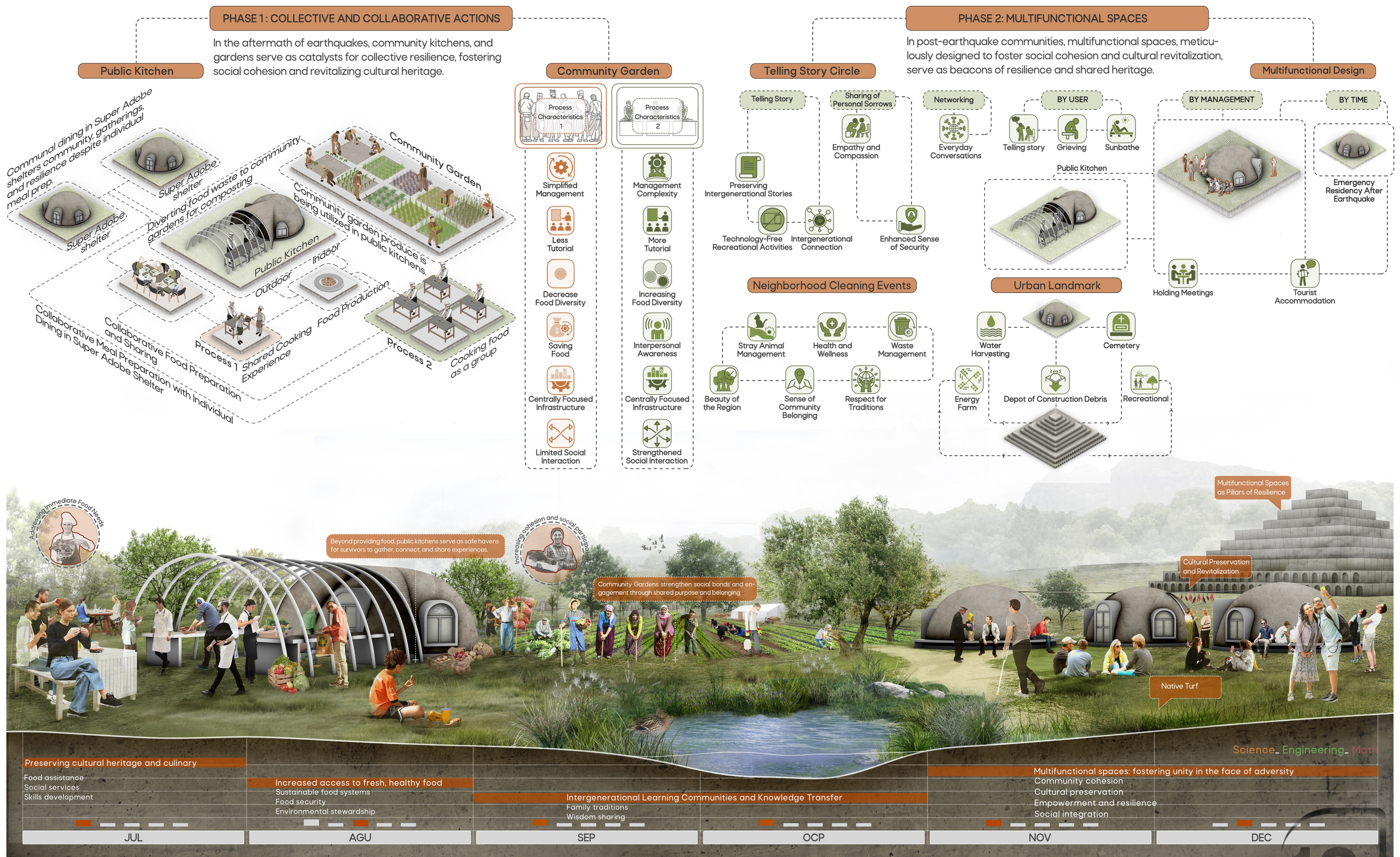
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JUN

The Answer Lies within Nature itself

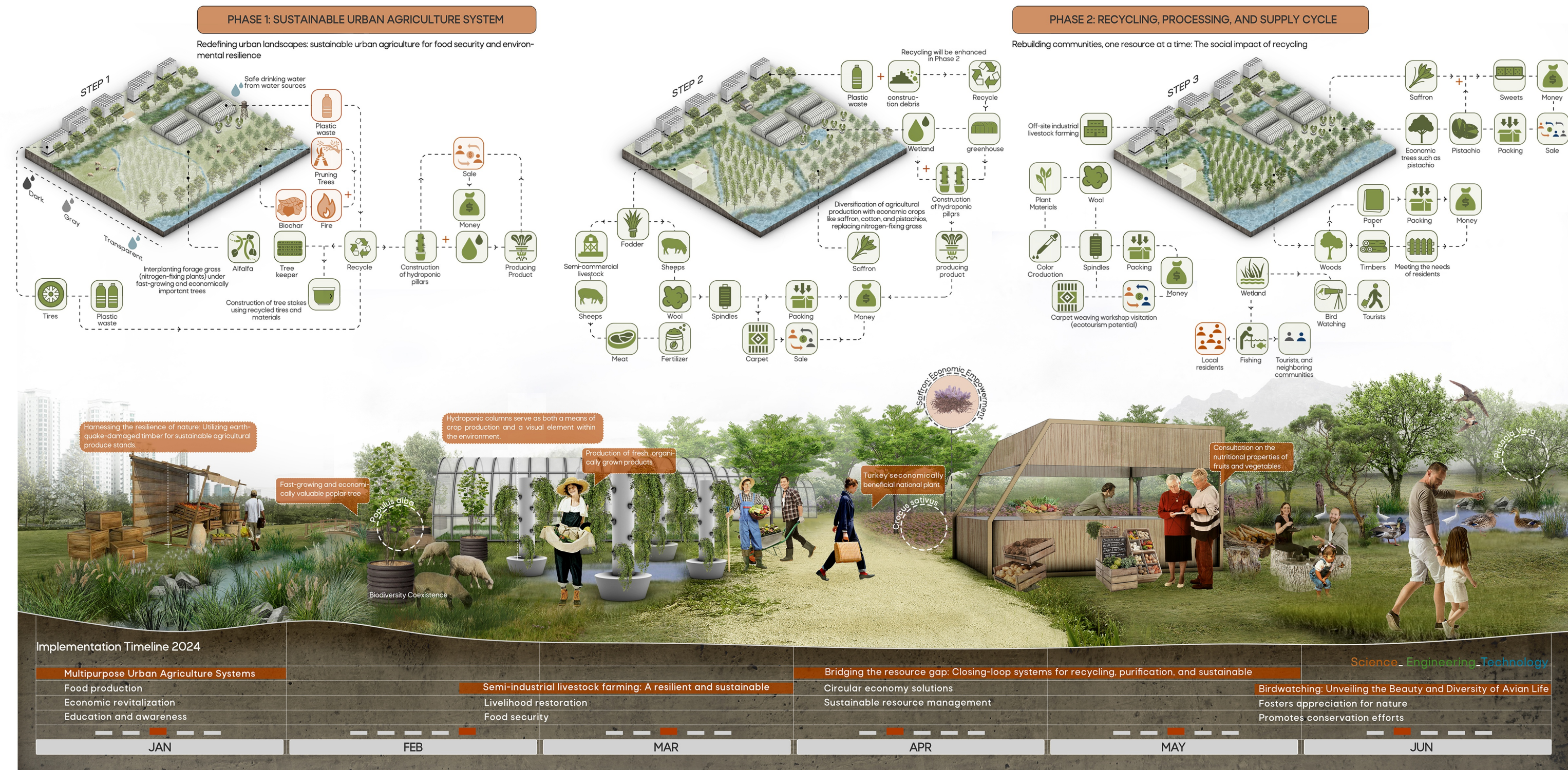
In a world undergoing climate change, traditional knowledge alone is not sufficient for adaptation.







GLOBAL STRATEGY III: LIVELIHOOD RESTORATION WITH GREEN INFRASTRUCTURE NETWORKS FOR ECONOMIC CHALLENGES IN EARTHQUAKE-AFFECTED COMMUNITIES



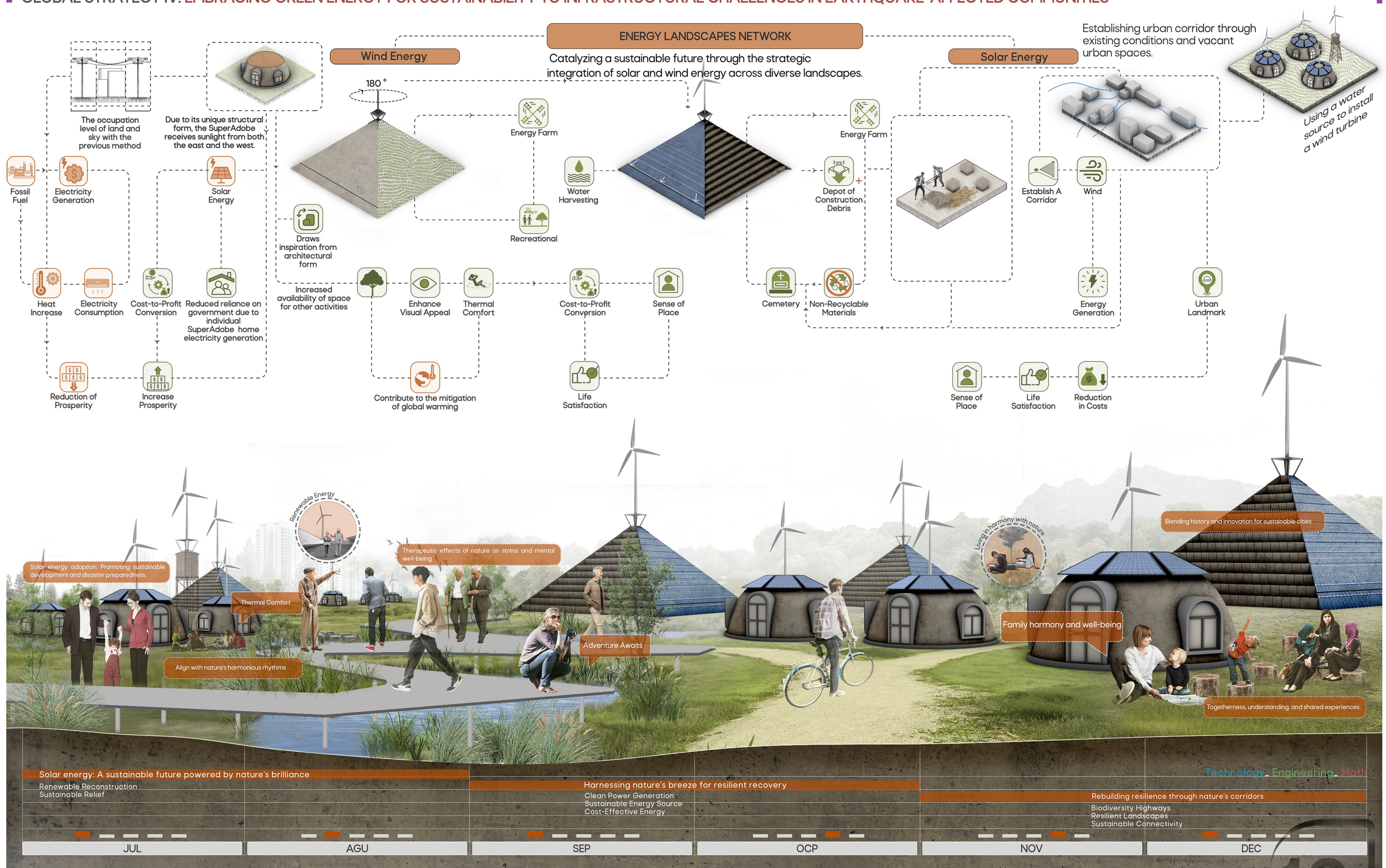
Costly Methods are Not Necessarily Profitable

In planning for expanded areas, solutions must be scalable and cost-effective, and green infrastructure possess these capabilities.

Country/City	Iran, Tehran
University / School	University of Tehran / School of Architecture, Urban Planning and Environment
Academic year	2023-2024
Title of the project	Natural Disaster, Landscape Architecture and Revitalization of Life (2023 Turkey Earthquake Experience)
Authors	Mahshid Del Avar



GLOBAL STRATEGY IV: EMBRACING GREEN ENERGY FOR SUSTAINABILITY TO INFRASTRUCTURAL CHALLENGES IN EARTHQUAKE-AFFECTED COMMUNITIES



A New Aesthetic Taste

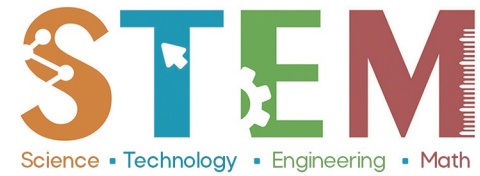
A new aesthetic Incorporates ecological considerations and cultivates public appreciation for elements that lead to sustainability.



## MANIFESTO

### NATURE AS A MULTIFUNCTIONAL INFRASTRUCTURE

The success of the NBI global concept in addressing Gaziantep's post-earthquake challenges serves as a powerful testament to the transformative power of nature in healing and renewal. Gaziantep revitalization of life stands as an inspiration to the world, showcasing the boundless potential of NBI in fostering a brighter future for communities affected by natural disasters.



*Man is that uniquely conscious creature who can perceive and express. He must become the steward of the biosphere. To do this he must design with nature.* Ian McHarg (Regional Planner & Landscape Architect, 1920-2001)

#### COEXISTENCE WITH NATURE



#### CONTINUITY OF LIFE



#### LIVELIHOOD RESTORATION



#### EMBRACING GREEN ENERGY



## Project Result

Leveraging nature-based infrastructure to enhance resilience and foster sustainable development in Gaziantep's earthquake-stricken communities.



# FUTURE VISION: SUSTAINABLE DEVELOPMENT

## Empowering Communities for a Resilient Future

The NBI global concept impact extends beyond physical transformation. It has nurtured a deep sense of community ownership and stewardship. People affected by the earthquake actively participated in the design and implementation process, fostering a sense of empowerment and collective responsibility for their shared future. This collaborative spirit has laid the foundation for a more resilient and sustainable community, one that is better equipped to withstand future challenges.



*Landscape architects apply nature-based, non-structural green strategies to design a more resilient, sustainable, and equitable future. ( Bruce Sharky,2023)*

2030



**ECOAGROTOURISM**

- 1. Embrace Sustainable Practices
- 2. Enhance Community Involvement
- 3. Promote Cultural Heritage



2040




**URBAN ECOTHERAPY**

- 1- Incorporate Nature into Design
- 2- Promote Nature-Based Activities
- 3- Sustainability and Conservation




2050



**LIVABLE CITY**

- 1. Prioritize Pedestrian-Friendly Design
- 2. Promote Mixed-Use Development
- 3. Enhance Public Transportation



Future

The future of sustainable development hinges on nature-based solutions like agroecotourism, urban ecotherapy, and livable cities.