
# ASSESSING FARM RESILIENCE TO CLIMATE CHANGE:INSIGHTS FROM FIELD-BASED ANALYSIS

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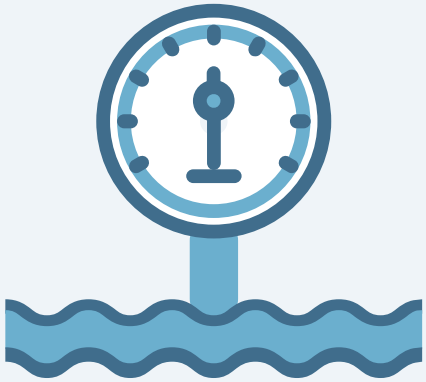
"Ecology now looks at nature as the first cosmonauts looked at the Earth—small, fragile, and unique"
**(Simonnette, 2005)**

# Content






# 1.Introduction

## 1.1.Climate change and agricultural production relationship

**“Agriculture as a contributor to Climate Change”**

*Agriculture to total food system emissions is from 7,300 to 12,700 MtCO2e per year*

*Of global anthropogenic emissions agriculture is estimated to account for about 60% of N2O and about 50% of CH4 (Wreford et.al., 2010) .*

*It’s about 14% to 24% of total global emissions (Vermeulen et. al., 2012)*

*Direct and indirect emissions*

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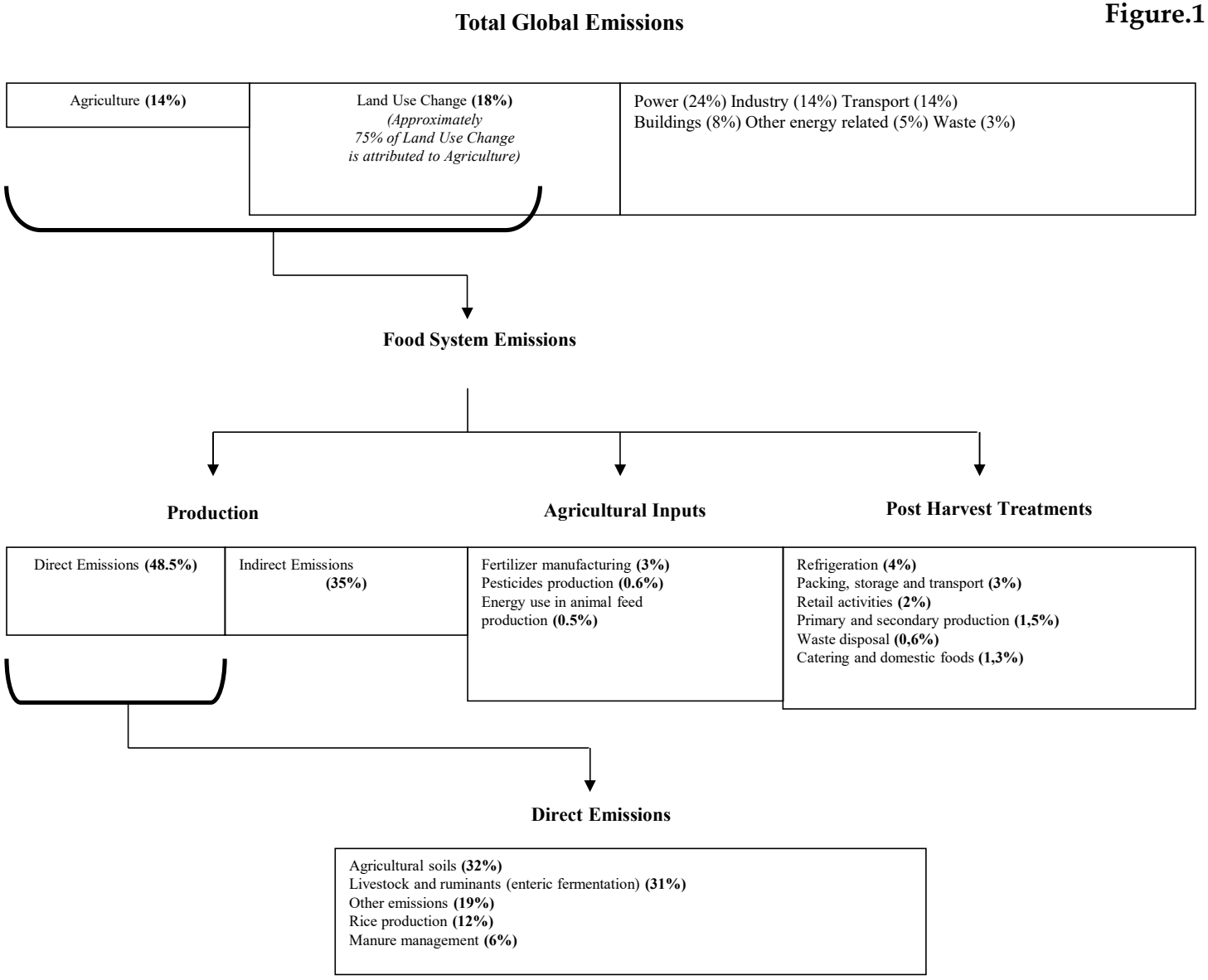
# Agriculture as a contributor to Climate Change

**Figure.1**. Greenhouse gases from agricultural sources (Vermeulen et.al., 2012; Wreford, 2007;CGIAR 2013)

**Figure.1**



# Climate change impacts on agriculture and food

- **Food security: Crop response-yield variability**
- **Food prices**
- **Food safety and nutrient losses**

# 1.2. Why family farmers matters ?

## Family Farming: A Global Pillar

Family farms perform diverse agricultural activities (crop cultivation, livestock farming, fisheries) and are often passed down through generations (FAO, 2018).

They are crucial for preserving traditional agricultural knowledge, promoting community well-being, and ensuring social equity (Van der Ploeg, 2020).

Despite producing the majority of the world's food, family farmers in developing economies are disproportionately affected by poverty (IFPRI, 2021).

## The Strategic Importance of Family Farming

**Multifaceted Value:** Family farming is strategically important for countries in socio-economic, environmental, and cultural aspects.

**Policy Focus:** In nations with a high concentration of family farms, agricultural policies are primarily aimed at supporting these businesses.

**Global Significance:** It is the most common form of food production in both developed and developing countries worldwide (Çelik, 2017).

# Why is the local level important for climate change adaptation?

**The local level is important for mainstreaming climate change adaptation for follow reasons:**

- *Climate change impacts are manifested locally, affecting local livelihood activities.*
- *Vulnerability and adaptive capacity are determined by local conditions.*
- *Adaptation activities are often best observed at the local level*
- *Decisions about livelihood strategies and investments can represent real-life demonstrations of adaptation.*

**However, while adaptation at the local level is important for sustainable development, it is not easy to generalise the process through which this occurs or should be facilitated. The more localised the scale of analysis and action, the more difficult it is to develop broadly applicable guidance on how to promote successful adaptation. Different administrative levels will have different roles in development policy planning and implementation, often depending on prevailing governance structures and approaches in a country (including the type and extent of decentralisation).**

# Motivation, inspiration and background of the study

**Previous studies:** Strengthening the Resilience of Family Farmers and Small-Scale Producers in The Agriculture and Food Sector in OIC Member Countries

**Aim:** This study aims to craft a detailed roadmap for enhancing the climate change resilience of family farmers and small-scale producers in Eskişehir Province, Türkiye

**Global Significance:** It is the most common form of food production in both developed and developing countries worldwide (Çelik, 2017).

## Expected results:

1. Generate evidence-based insights to inform both policy and practice. Identify the key challenges faced by family farmers and small-scale producers, including limited access to markets, finance, and technology.

2. Contribute to academic understanding and inform policy-oriented research across climate change, agricultural economics, food security, and sustainable rural development.

3. Examine successful resilience-building strategies and best practices

4. Develop a roadmap for policymakers and stakeholders, offering evidence-based recommendations.

# Methodology for Case Study Selection and Analysis

## Desk Review:

Analyzing open-source reports, government publications, and institutional studies.

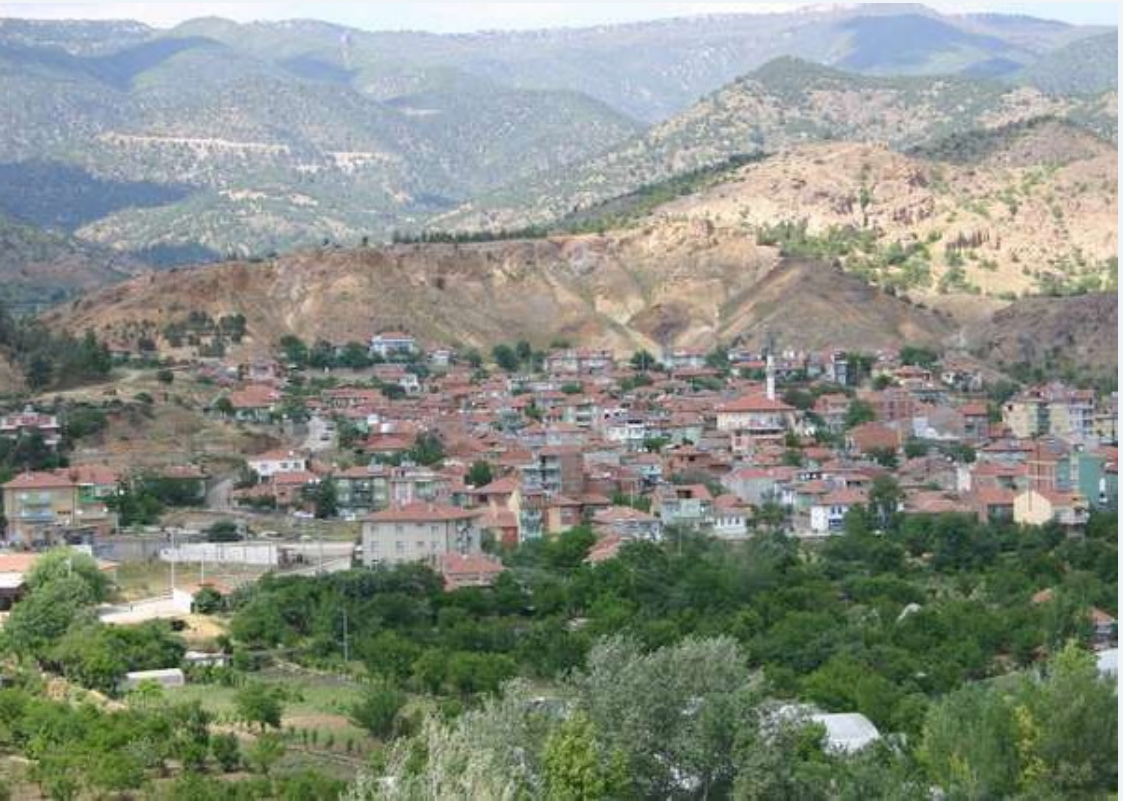
## Surveys and Interviews:

Conducting structured interviews with policymakers, farmer cooperatives, and agricultural experts. Field Research ..

To achieve this, primary data will be gathered through structured surveys targeting small scale farmer groups and key stakeholders. Resilient scale was conducted

The survey instrument has been designed to capture three key dimensions of resilience: Robustness, adaptability, and transformability with a strong focus on climate change impacts.

# Prefindings case study results



- Saricakaya District of Eskisehir Province is located 45 km from the city centre, on the provincial border of Ankara
- The district established in the valley has a microclimate
- It is called “Mediterranean of Central Anatolia”
- Agricultural production activities are carried out for 12 months of the year.
- The livelihood of the region is based on agriculture.
- The altitude in the region varies between 180-230 metres
- Covered and open field agriculture is carried out in 23426 decares in the region (TUIK 2022).
- 40 vegetables, mainly tomatoes, cucumbers, eggplant, zucchini, beans, arugula, lettuce, parsley, pomegranates, olives are grown and viticulture is carried out


# Survey findings:

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Age | 30 | 54.4 | 15.03697 | 24 | 76 |
| Education | 30 | 3.6 | 1.191927 | 2 | 6 |
| Agri. income | 30 | € 7600 | 533752.6 | €100000 | €40890 |

***Gender:*** *73% Man, 26% Women*

Experience varies from 5-50 years

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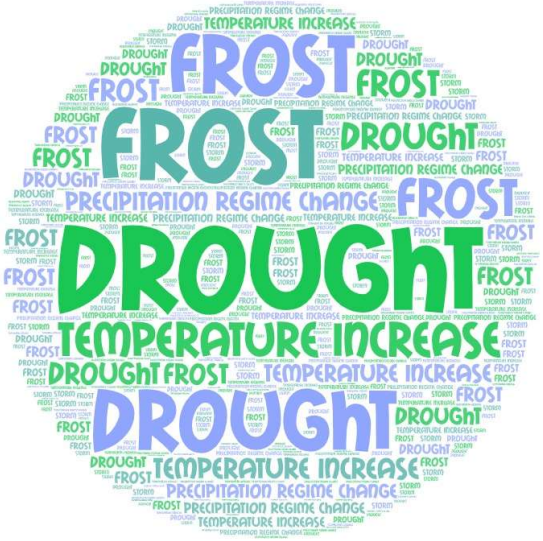
**Q:** *Have you observed any changes in climate elements in your region in the last 10 years?*
**A:** *Yes (100%)*

**Q:** *What do you think is the climate event that most negatively affects agricultural production? (drought, flood, excessive rainfall, change in rainfall patterns, frost)*

**A:** *1-Drought,2- flood,3- excessive rainfall, 4-change in rainfall patterns,5- frost)*



# Water consumption and management

**Q:** *Have climate conditions impacted your water supply or quality over the past 5 years?*
**A:** *43,3% Definitely agree*

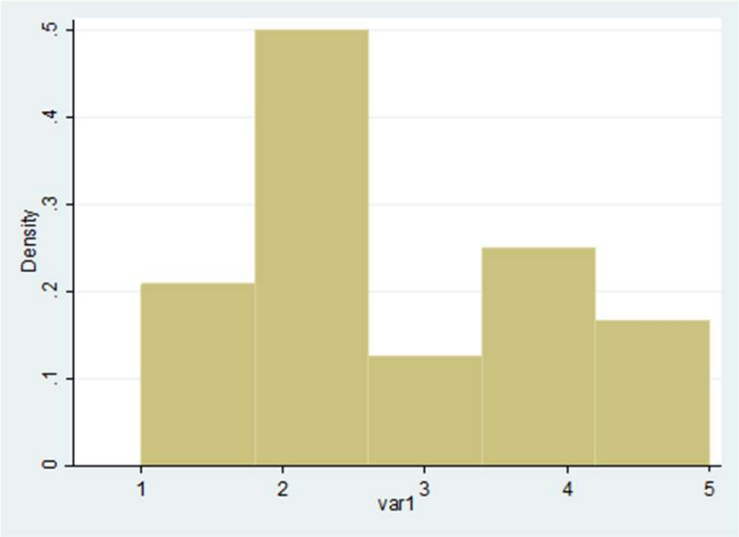
**Q:** *I have access to enough water to meet my irrigation needs*
**A:** *Only 4% can access to water properly*

**Q:** *Increasing water tariffs is necessary for the protection of water and soil.*
**A:** *Most of the producers find the prices of water already high enough.*

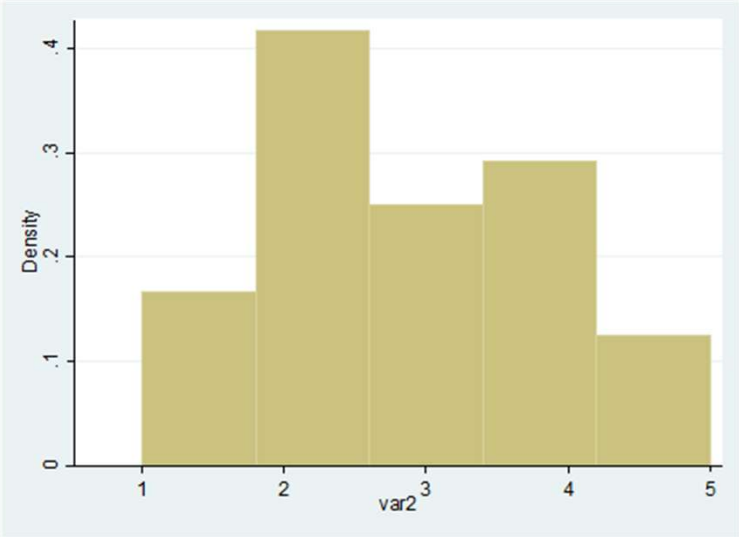
**Q:** *The more water is used in the field, the more the yield increases.*
**A:** *36.67% not agree and equal to 20% agree-disagree*

**Q:** *Increasing water tariffs is necessary for the protection of water and soil.*
**A:** *Most of the producers find the prices of water already high enough.*

# Robustness: Statements about resilience (1)

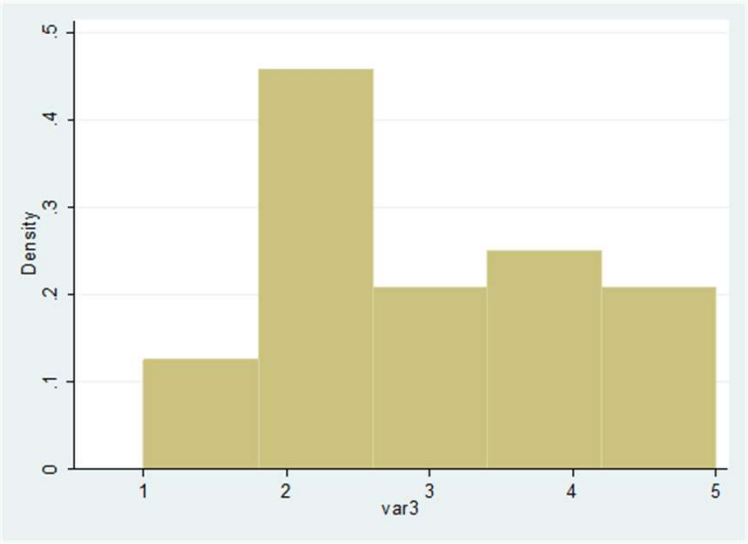



"I have strategies to ensure my business can continue its production during economic crises and natural disasters."

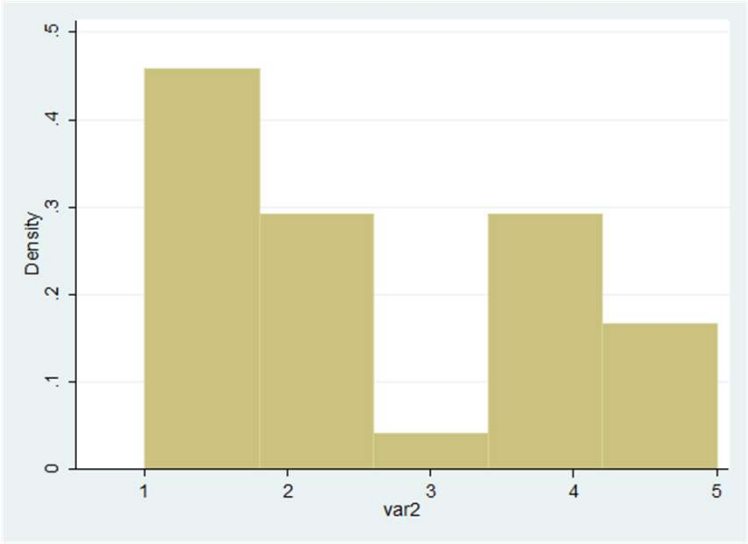



"I can regularly adapt my agricultural activities according to consumer demands and environmental requirements."

# Adaptability: Statements about resilience (2)




"I am confident in my business's future growth potential and I'm making long-term plans."




"Non-agricultural income sources contribute to the sustainability of my business."

# Transformability: Perception about climate change

Have you changed your pesticide/chemical use in recent years?
100% YES- Because **Pest populations have increased due to rising temperatures. T**he active ingredients of pesticides have become less effective

Most frequent natural hazardous is frost ..

"I protect myself against climate risks by diversifying my income.“
50% say yes , %50 say no

What are the main methods you use to compensate for economic loss?
%50 say nothing but 10% change the variety or product, 10% decrease general costs , %10 change market channel %5 giving up organic agriculture 5% start animal husbandry %10 no comment

I have up-to-date information about climate change and weather conditions.
75% Yes % 25 No

# Transformability: Perception about climate change (2)

I take precautions to protect my physical health during extreme heat and difficult agricultural conditions
53 % agree 47%disagree.

What do you think ideal farming should be like? If you had the means and resources, what would you change in agriculture?

I trust in my operation's future growth potential and make long-term plans. (not really ??)

# Agricultural mitigation potential (1)

- In agriculture, mitigation and adaptation interact with each other simultaneously
- There is no universally applicable list of mitigation practices
- Climate-smart agriculture [CC adaption and mitigation with sustainability (Kanamaru, 2012)]
- Climate friendly
- Consume local foods
- Organic agriculture (carbon sequestration, tillage etc.)
- Efficiency of input usage
- Crop rotations

# Agricultural mitigation potential (2)

- How farms can reduce emissions now?
- Which agricultural policies? cross-compliance, helping to modernise farms (e.g. via energy-efficient equipment and buildings),
- Training and advisory services, agri-environmental schemes
- Agricultural wastes / stubbles burning

# Lessons learned, best practices or tailor-made policies?

Other times, local decision making processes are influenced by informal, unpredictable or idiosyncratic factors such as individual personalities (e.g. opinion leaders), cultural preferences (e.g. traditional decision-making bodies), or events (e.g. election, conflict, earthquake).

Thus, this policy guidance should be viewed as providing general information that will need to be interpreted and applied in practice in light of local circumstances, opportunities, limitations and needs.

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# Conclusion

**Community participation and incorporation of local/ indigenous knowledge should be embedded in management planning and interventions in order to capitalize on the knowledge, experience and skills of local actors in order to avoid mal-adaptation; and to ensure community ownership of ecosystem management into the future**


Thank you

Ευχαριστώ πολύ για την προσοχή σας.

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