

# Urban and Peri-Urban Agriculture and Its Role in Land System Dynamics: Insights from Meknès, Morocco

**Fatiha Hakimi <sup>1</sup>, Fouad Elame <sup>2</sup>, Karima Elbaati <sup>1</sup>, Boutayna Nakhili <sup>1</sup>, Hayat Lionboui <sup>2</sup>**

<sup>1</sup> Department of Plant Production, Protection and Biotechnology, Hassan II Institute of Agronomy and Veterinary Medicine, Rabat, Morocco

<sup>2</sup> Department of Economy and Rural Sociology, National Institute of Agronomic Research (INRA), Morocco

## INTRODUCTION & AIM

Urban and peri-urban agriculture (UPA) is a strategic response to global challenges like food security, urbanization, and climate change. In Morocco, the agricultural sector is a cornerstone of the economy. The city of Meknès faces intense pressure from urban expansion, leading to the conversion of agricultural land and threatening local food systems.

**Aim:** This study aims to characterize, diagnose, and perform a multicriteria analysis of agricultural production systems in the peri-urban areas of Meknès to understand their sustainability, multifunctionality, and role within urban land system dynamics.



Figure 1: Agricultural systems in Urban and Peri-Urban areas of Meknès city (Morocco)

## METHOD

- **Study Area:** Six peri-urban zones around Meknès, Morocco.
- **Sampling:** 25 agricultural farms were selected across the six zones.
- **Data Collection:** A comprehensive survey of 80 questions covering:
  - Farmer and farm identification
  - Production systems and management practices
  - Marketing channels
  - Economic costs and revenues
  - Constraints faced
- **Data Analysis:** Descriptive statistics, Chi-square tests, Student's t-tests, Shapiro-Wilk normality test, Levene's test, and Principal Component Analysis (PCA).

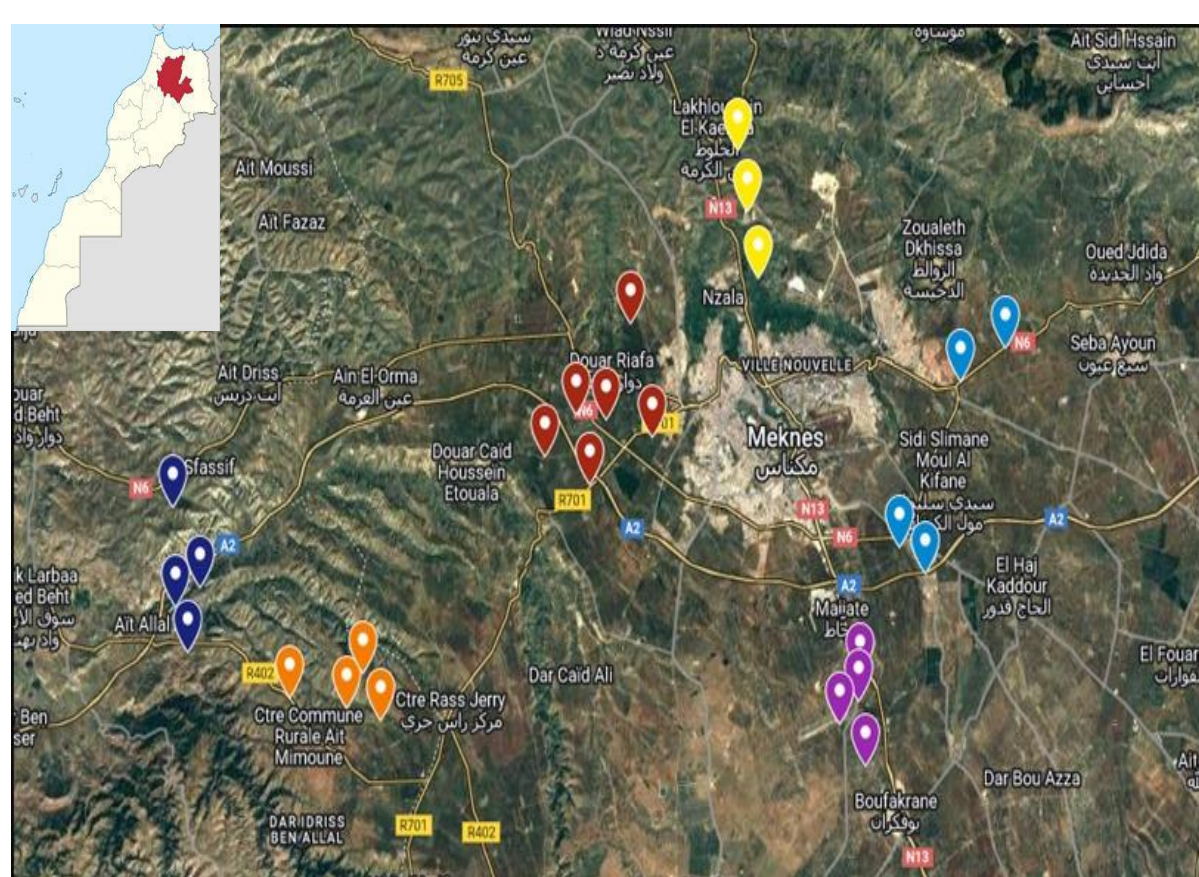


Figure 2: Geographical location of study sites in the outskirts of Meknès

## RESULTS & DISCUSSION

## 1. Characterization of Farmers and Production Systems:

- Farms are primarily managed by experienced but aging farmers (51+ years old).
- Direct ownership is the dominant land tenure system.
- Organic farming practices are nearly absent.
- PCA revealed distinct typologies of farming systems across the six zones.

## 2. Economic Multifunctionality & Short Supply Chains:

- UPA provides fresh produce (fruits & vegetables) to the city through short, direct marketing channels (Hakimi, 2022).
- A Wilcoxon test showed that 75% of farmers earn a monthly income close to the Moroccan agricultural minimum wage (SMAG, ~2300 MAD), highlighting its role in livelihood generation.
- UPA is a significant source of employment in the peri-urban area (Hakimi, 2022).

### 3. Environmental Multifunctionality:

Farmers perceive UPA as contributing to environmental protection and the beautification of Meknès.

#### 4. Key Constraints (Land System Dynamics):

- **Land Pressure:** Urban expansion is the primary threat, causing a decline in agricultural activity (Valette and Dugué, 2017).
- **Environmental Challenges:** Lowering water tables, and pollution of soil, groundwater, and air (Sánchez et al., 2022).
- **Economic Pressures:** Rising costs of inputs and fuel.
- **Institutional Gaps:** Lack of public support, training, and extension services.

## CONCLUSION

- UPA in Meknès is a multifunctional system, essential for food supply, livelihood generation, and environmental services.
- It operates under significant strain due to multiple pressures. The sector faces an aging farmer population with low renewal of the workforce.
- The conversion of agricultural land to urban use is the most critical challenge to its sustainability.

## REFERENCES

- Hakimi, Fatiha. (2022). Assessing Multifunctionality and Sustainability of Peri-Urban Farming: A Case Study in The Casablanca Metropolitan Area (Morocco). *International journal of Horticulture Agriculture and Food science*. 6, 01-06.
- Silva-Novoa Sánchez, L. M., Bossenbroek, L., Schilling, J., & Berger, E. (2022). Governance and Sustainability Challenges in the Water Policy of Morocco 1995–2020: Insights from the Middle Draa Valley. *Water*, 14(18), 2932.
- Valette, É., & Dugué, P. (2017). L'urbanisation, facteur de développement ou d'exclusion de l'agriculture familiale en périphérie des villes: Le cas de la ville de Meknès, Maroc. *VertigO-la revue électronique en sciences de l'environnement*, 17(1).