

Temporal dynamics of vegetation cover and agricultural development in the High-Atlas and Anti-Atlas of Morocco from 1990 to 2020 using Landsat 5-7 and 8

Nacer Aderdour^{1,2}, Thanh Thi Nguyen¹, Hassan Rhinane², Andreas Buerkert¹

¹Organic Plant Production and Agroecosystems Research in the Tropics and Subtropics, University of Kassel, 37213 Witzenhausen, Germany

²Faculty of science Ain Chock, University of Hassan II-Casablanca, Casablanca, Morocco

INTRODUCTION

During the last decades oases in the High-Atlas and Anti-Atlas Mountains of Morocco have undergone major changes of landuse and land cover (LULC) [1] which, however, lacks quantification. While these oases produce cereals, palm trees, fruits, and vegetables, they have also become touristic areas. This transformation allows marketing of their landscape features, local products, and traditional culture, but has unknown implications for their sustainability [2].

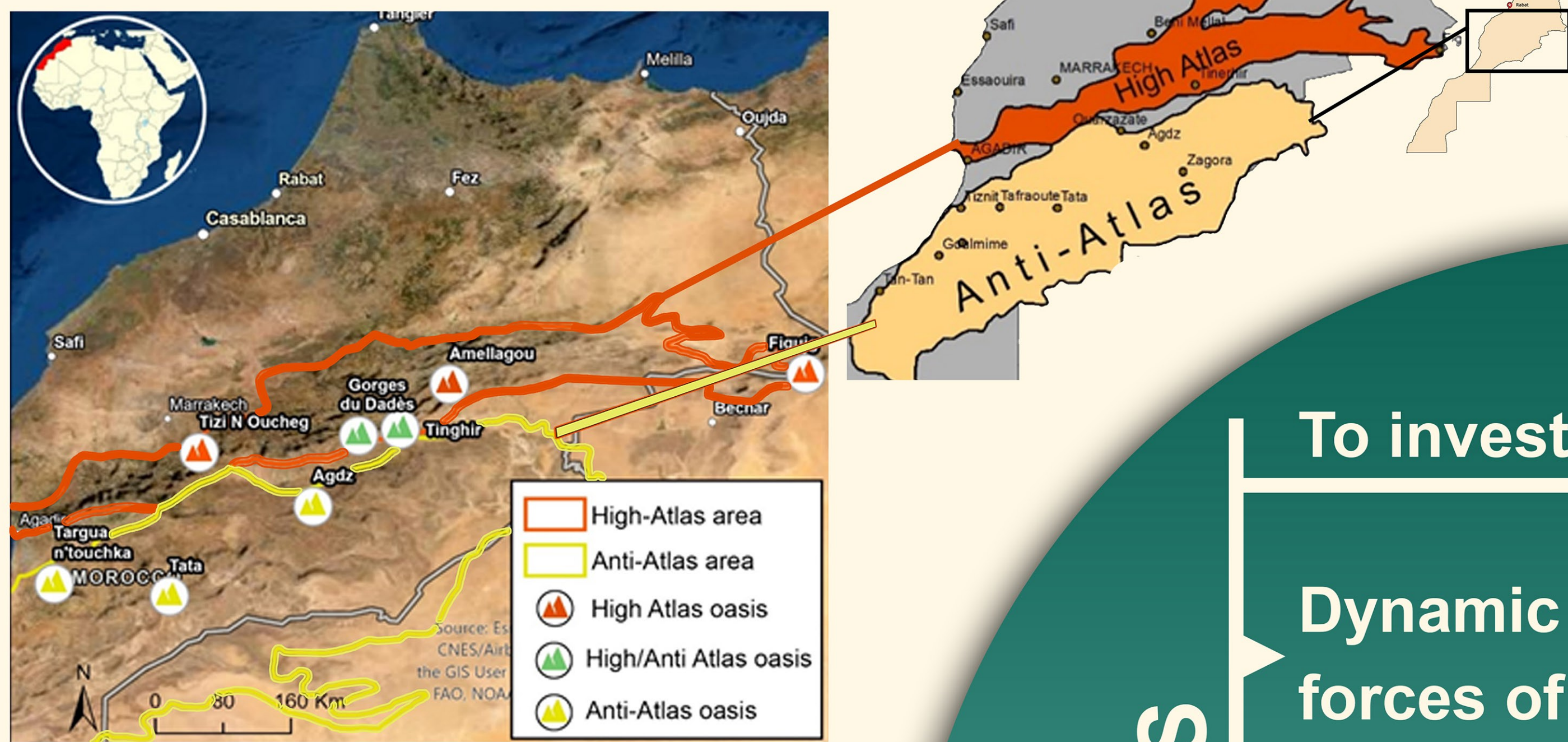


Fig.1: Location of study areas

RESULTS

Between 1990 and 2020:

- ▶ Bareland decreased from 94% to 84%
- ▶ Forest and open vegetation cover < 30% of the total area.
- ▶ Total forest area doubled from 3090 to 7362 km²

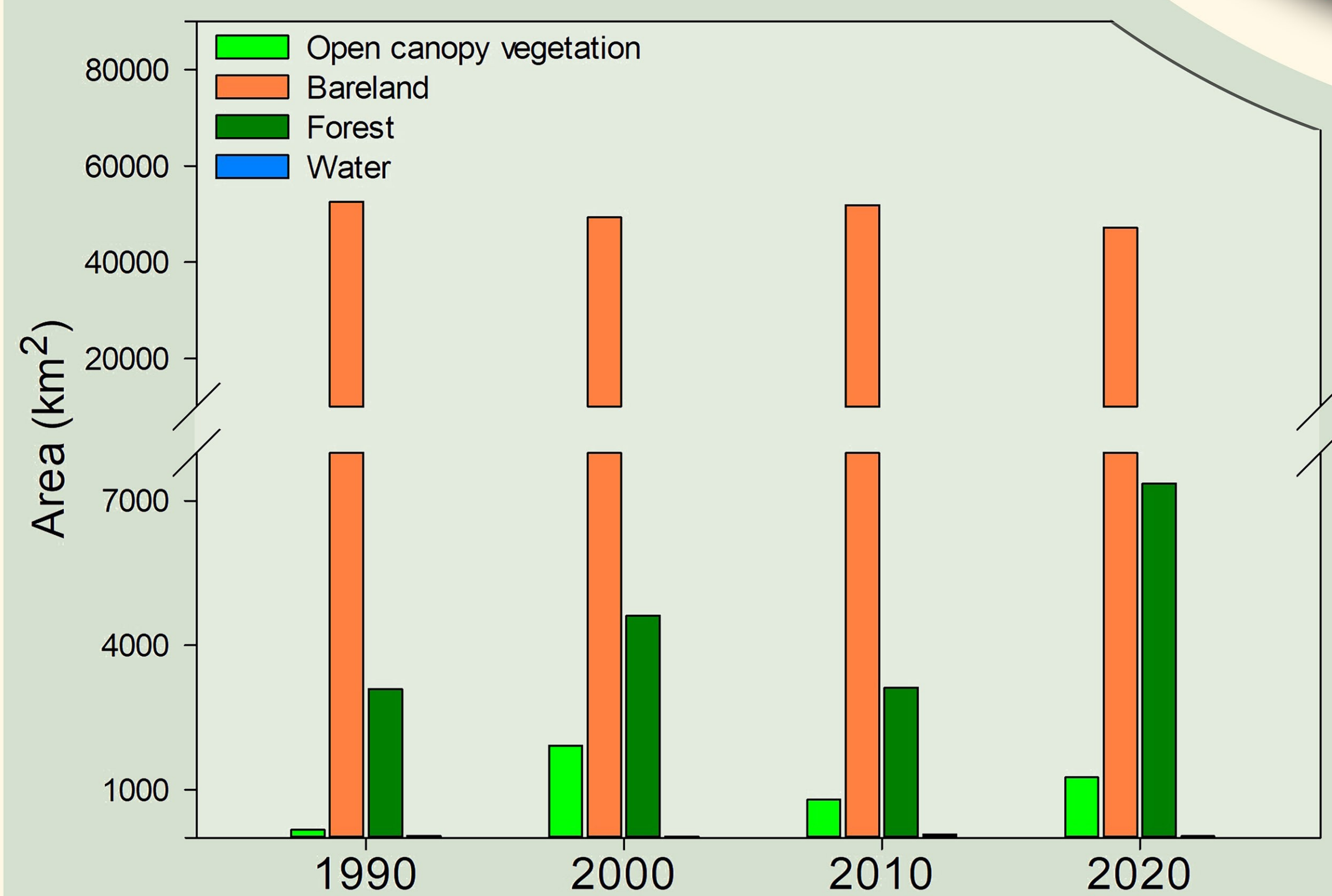
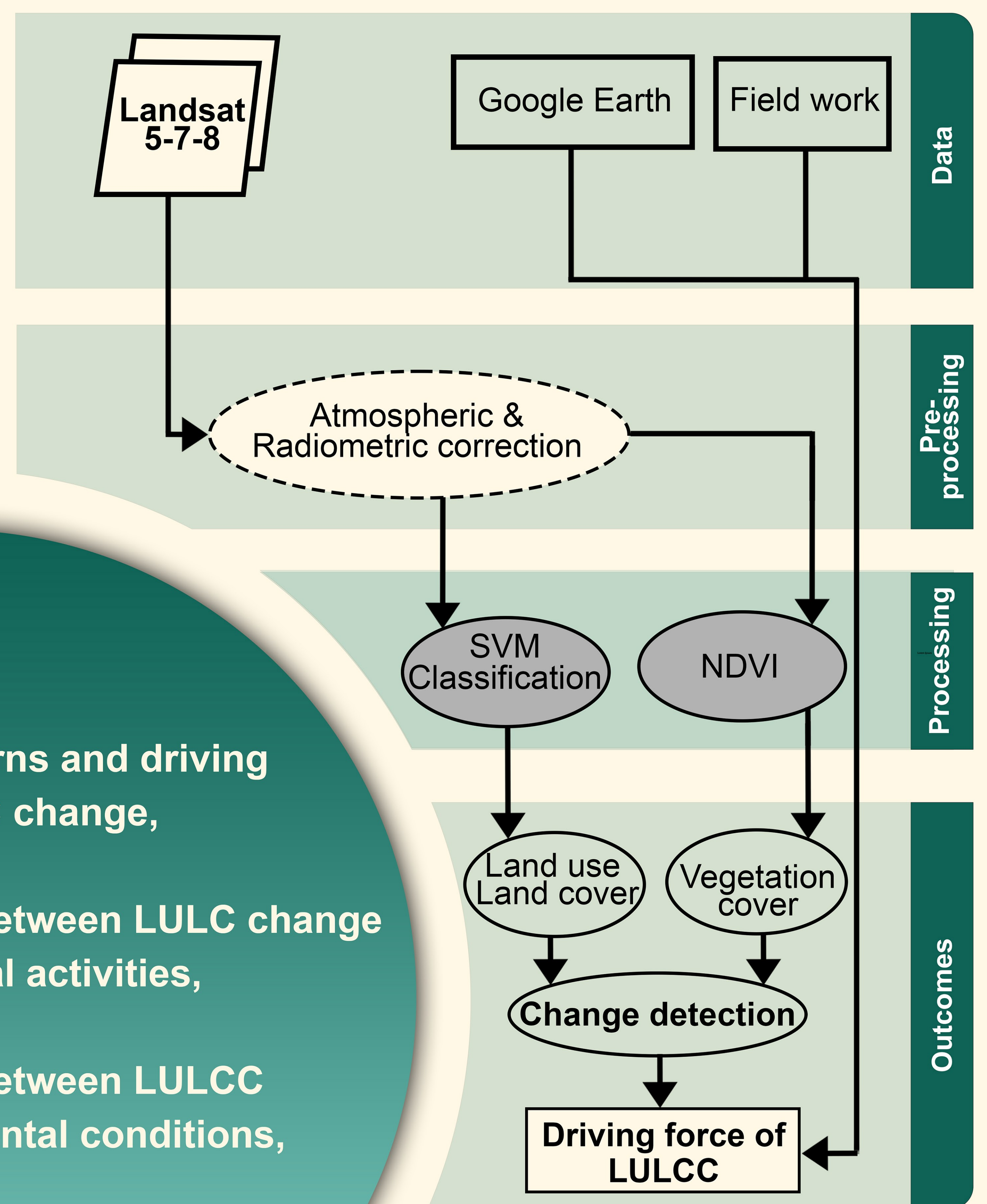


Fig. 2: Results of image classifications from 1990 to 2020 by class in km²

METHODOLOGY



To investigate:

Dynamic patterns and driving forces of LULC change,

Relationship between LULC change and agricultural activities,

Relationship between LULCC and environmental conditions,

Assess the sustainability of Moroccan Oases.

OBJECTIVES

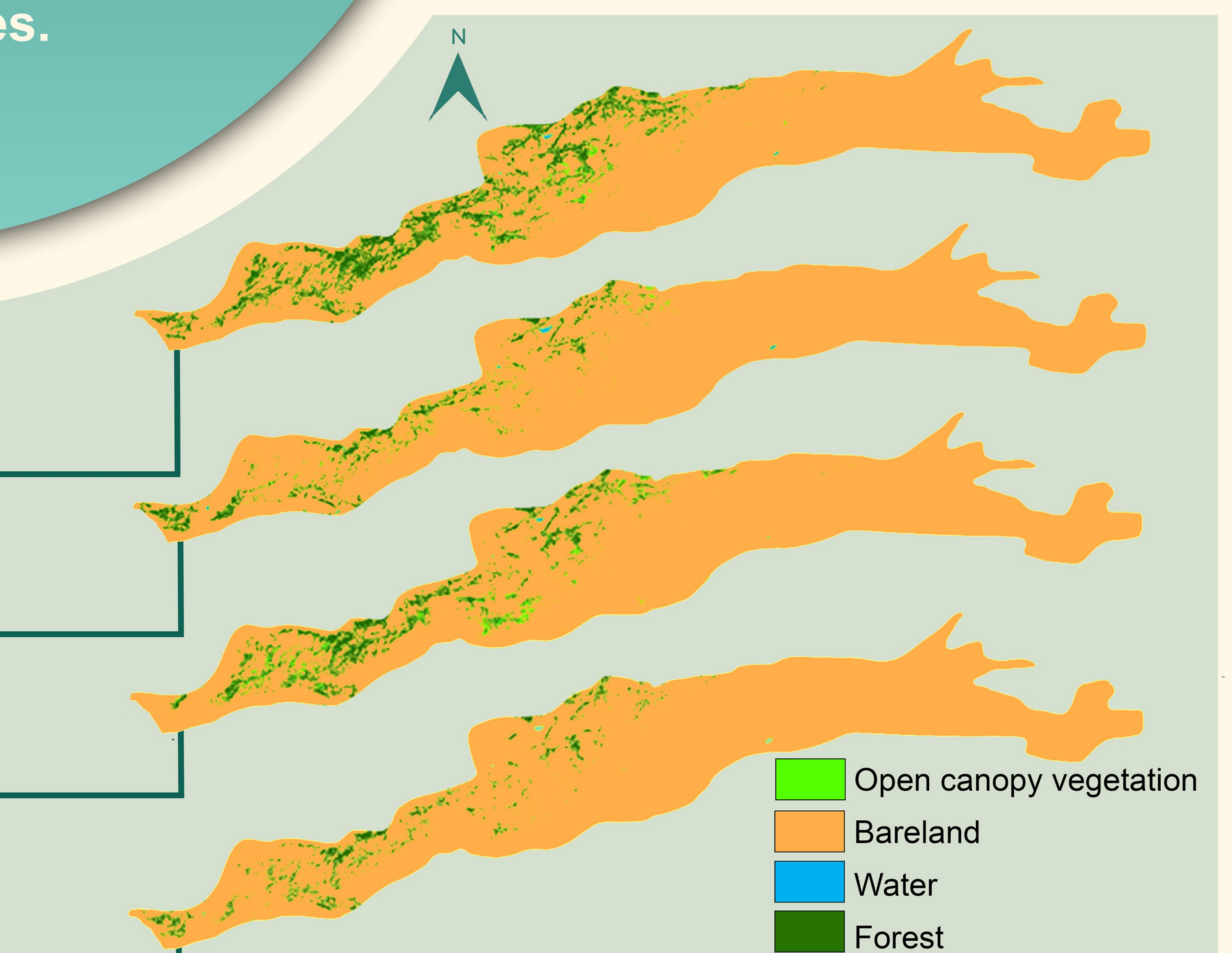


Fig. 3: Results of image classifications from 1990 to 2020

CONCLUSIONS

Survey results indicate that economic drivers leading to rural-urban migration determine LULC. This leads to major changes in ecosystem services that the oases provide. The latter merit further quantification.

ACKNOWLEDGEMENTS

The authors are thankful for Erasmus+ funding to the first author.

Bibliography:

- [1] Lamqadem, Atman Ait, Hafid Saber, and Abdelmejid Rahimi. 2017. Spatiotemporal Changes of Vegetation in the Middle Draa Valley Oasis: A Study Case of M'hamid El Ghizlane Oasis (Morocco).
- [2] Garbati Pegna, F., Bartolini, P., El Rhaffari, L., Fahim, S., Bonaiuti, E., Le, Q. B., Zucca, C., 2017. Sustaining moroccan oasis agricultural system through small mechanization inputs.