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## Proceedings

The 5<sup>th</sup> Conference of the International Society of Camelid Research and Development  
**ISOCARD 2018**

“ Recent advances in camelids biology, health and production ”

12 - 15 November 2018  
Laâyoune, Morocco



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ولاية جهة العيون الساقية الحمراء



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## Main drivers of mobility changes within camel herds: between tradition and modernity

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### ABSTRACT

At the interaction between oases and deserts, camel systems have been identified as the most efficient in valorizing scarce resources (water, land and capital). These systems have recently witnessed important changes due to climate change, the modernization of living conditions and the evolutions in resources' access and regulation (mainly water and land). Even if mobility remains the pillar of camel systems' sustainability, its present configuration escapes all the ancient or a-priori models like nomadism or transhumance. This study aims to describe the recent changes in mobility management by camel breeders in Zagora region (Center Eastern Morocco) and identifies their main drivers. Two methodologies were used: a narrative approach to describe mobility management between generations and a holistic approach to understand the current diversity of mobility. This work was based on a survey conducted near 41 camel breeders during 2017, using a semi-structured questionnaire.

The main results allowed identifying four patterns of mobility within camel farming systems according to two main factors: the lifestyle (under tent on the rangelands or in house in the oasis villages) and the land and cropping system. Adding the variables of mobility management, we observed significant links between camel farming systems and mobility management. Camel herders with tree-crop systems (type 1) can afford periodically long mobility (> 1000 km) to access far pastoral resources, whereas camel herders living under the tent (type 2) practice short mobility around the settlement. The camel herders who have adopted a modern life pattern and developed bivouac activities for tourists (type 3) practice a hybrid system of mobility with 3 to 4 months under the tent during the summer season (called Azib) and 8 to 9 months in the village where the camels are kept in the pen. In the Azib system, camel herders maintain the tradition of mobility with the tent, but they move alone leaving their family at the village. The last system (type 4) concerns large families with one or more married sons in the family. Due to the important family labor availability, mobility remains in a short and medium distance which makes it possible to set up a turn of role for guarding the herds. Current forms of mobility differ however significantly from the ancient practices oriented to long (and transboundary) movements with the whole family. These changes can be explained by two factors: the closure of the border between Morocco and Algeria and the generalization of children schooling. The new configurations of the mobility render camel herders more dependent on off-farm feed resources and the generational transmission of rangelands management may no longer be ensured. This calls more attention from policy makers or development agencies to maintain local knowledge and allow the preservation of these activities in an environment severely threatened by the global warming in synergy with anthropic actions.

**Keywords:** Camel system; Mobility; Nomadism; Transhumance; tradition; modernity

### INTRODUCTION

At the interaction between oases and deserts, camel systems have been identified as the most efficient in valorizing scarce resources (water, land and capital) (Senoussi, 1999). These systems have recently witnessed important changes due to climate change, the modernization of living conditions and the evolutions in resources' access and regulation (mainly water and land) (Faye 2016). Even if mobility remains the pillar of camel systems' sustainability, its present configuration seems to escape all the ancient or a-priori models like nomadism or transhumance. This study aims to describe the recent changes in mobility management by camel breeders in Zagora region (Center Eastern Morocco) and identifies their main drivers.

### METHODOLOGY

Our study was located in two communes (Tagounite and Mhamid), downstream the Drâa valley (Zagora governorate). Climate conditions are mainly arid with average rainfall levels below 150 mm per year. The rangeland are composed of dispersed perennial xerophyte plants and ephemeral herbaceous vegetation, depending on

rainfall, on the stony surfaces of the plateau (Hamada) and the desert plain (erg). In the oasis, dates and palms are almost the only possible crops for subsistence purposes. The main livestock activities are camels with small ruminants.

This field investigation aimed to provide a database to approach mobility management changes in camel breeding systems in the two communes and to relate them to the diversity of family farming systems (by referring to Scoones 2009 and McAllister et al., 2006). Two methodologies were used: a narrative approach to describe mobility management between generations and a holistic approach based on farm survey and factorial analyses to understand the current diversity of mobility. The camel herders' survey was conducted with 41 interviewees between April and July 2017. The individual interview was composed of two parts. Firstly, we conducted an opened interview with the herder who described the changes in the herd mobility from the previous generation to the current one. This retrospective approach of changes was led on the basis of narrative approaches (type life stories). This makes it possible to highlight the main factors of changes during the last decades, but also to discuss the future trajectories of these systems with the breeders. Secondly, we used a semi-structured questionnaire to collect qualitative and quantitative information on: (i) family composition, land tenure and crop system, and the livestock composition, (ii) the mobility management over the previous year; (iii) a comprehensive description of feeding and management practices for camel health; and (iv) a qualitative approach to understand changes in mobility in relation to various factors.

**RESULTS AND DISCUSSION**

The main results allowed identifying four patterns of mobility within camel farming systems according to two main factors: the lifestyle (under tent on the rangelands or in house in the oasis villages) and the land and cropping system. Adding the variables of mobility management, we observed significant links between camel farming systems and mobility management (Fig 1). Camel herders with tree-crop systems (class 1) can afford periodically long mobility (> 1000 km) to access far pastoral resources, whereas camel herders living under the tent (class 2) practice short mobility around the settlement. The camel herders who have adopted a modern life pattern and developed bivouac activities for tourists (class 3) practice a hybrid system of mobility with 3 to 4 months under the tent during the summer season (called *Azib*) and 8 to 9 months in the village where the camels are kept in the pen. In the *Azib* system, camel herders maintain the tradition of mobility with the tent, but they move alone leaving their family members in the village. The last system (class 4) concerns large families with one or more married sons. Due to the important family labor availability, mobility remains in a short and medium distance which makes it possible to set up a turn of role for guarding the herds. Current forms of mobility differ however significantly from the ancient practices oriented to long (and transboundary) movements with the whole family. These changes can be explained by two factors: the closure of the border between Morocco and Algeria and the generalization of children schooling. The new mobility configurations render camel herders more dependent on off-farm feed resources and the generational transmission of rangelands management may no longer be ensured. This requires more attention from policy makers or development agencies to maintain local knowledge and allow the preservation of these activities in an environment severely threatened by the global warming in synergy with anthropic actions (e.g. grazing management).

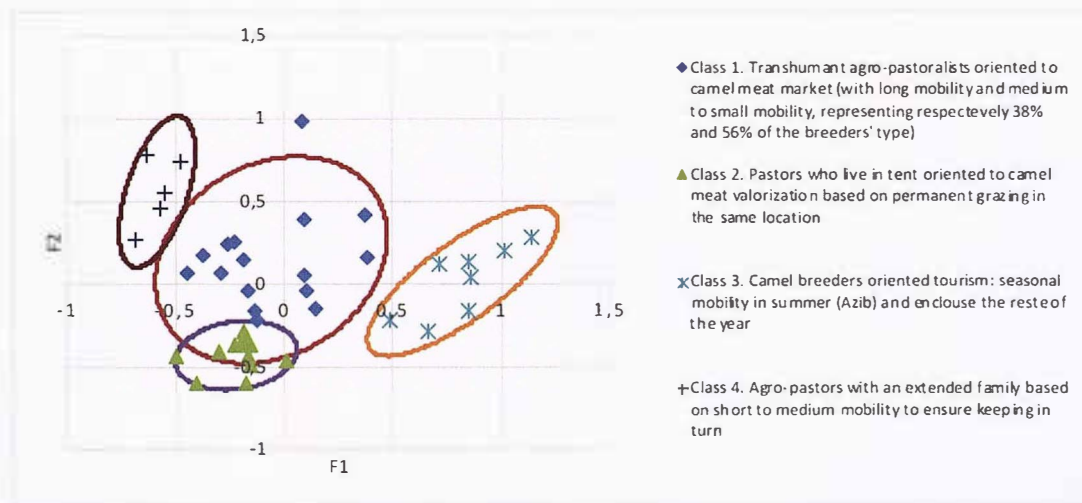


Fig 1. Factorial regression clustering of breeders based on farming systems approach. The criteria related to camel mobility management are projected as supplemental variables.

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