Structure and age dynamics of breeders in the western Algerian steppes (region of Nâama)

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Abstract

This paper attempts to study the age structure of the stock breeders of the Nâama region located in the west of Algeria, and to interpret the dynamics of the classes of these ages according to breeding techniques, to know the trend of this activity that characterizes the region of Nâama recognized for its pastoral vocation. Like the other Algerian steppes, the herders of the western regions suffer from a real upheaval that has strongly impacted their lifestyle and consequently their livestock systems, under the combined effect of a number of natural and anthropogenic factors in a political, economic and social context. In order to gather the information necessary for this work, we selected a representative sample of 364 livestock holders randomly distributed across the study area, from a total number of the targeted population estimated at 6.700 breeders, setting a margin of error of 5% and a confidence rate of 95%. It emerges that the mobility of herds is in clear decline, especially transhumance, giving way to practices which present interdependence between livestock breeding and land appropriation, where sedentarization, the intensification of livestock farming and its association with some agricultural practices follow a growing trend. In addition, the mixed profile, which includes those who are both breeder and fattener, seems preferable to young breeders.

***Key words**:* dynamics of ages; breeders; steppes; region of Naama

Introduction

The Algerian steppes (about 20 million hectares) stretching from the Moroccan borders to the Tunisian borders, represents a territory with a pastoral vocation generally devoted to the raising of livestock, especially sheep species (Bensouiah, 2004). Before the colonial era (1830), the Algerian steppe was characterized by a tribalist social organization and a nomadic lifestyle (Bencherif, 2011); then, the first modifications of this existence were triggered just in parallel with the colonial period when a break in the movement of tribes was provoked by a systematic control that broke the spatial continuity inside the steppe expanse (Mohamed et al., 2015). After independence in 1962, the public authorities inherited a small area of the steppes following the installation of the Settlers' farms occupying tributary lands (Mohamed et al., 2015). There was a real upheaval in the livestock systems and lifestyles of the local population in a rapidly changing political, economic and social context. The practice of sheep breeding in the Algerian steppes is often ensured by the rural population, which is not immune to these changes a result to the social mutation that impacts their main activity and the animal wealth in relation. It is an important economic sector that is being disrupted, causing social unrest that is reflected in the age structure of breeders by exposing skills and know-how to the risk of loss. The wilaya of Nâama, located west of the Algerian Steppe ribbon as shown in Figure 1, is a territory exposed to degradation since the 1980s (Aziz et al., 2010) under the combined effect of several anthropogenic and natural factors (Moulay et al., 2011). This has led to profound so-

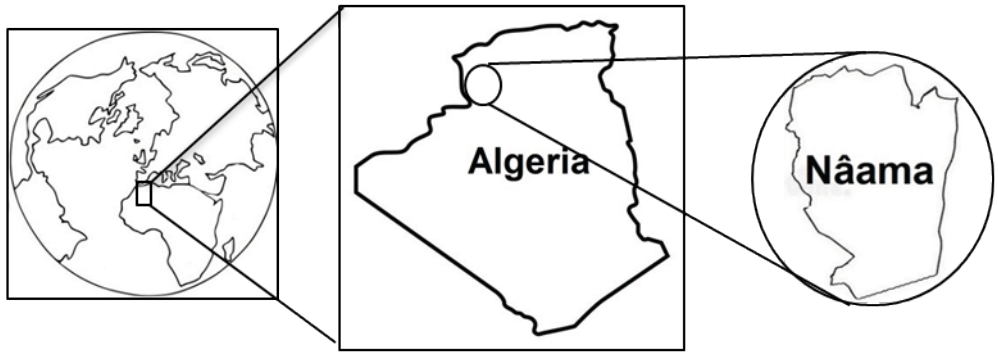

Fig. 1. General location of study area (region of Nâama)

cio-economic transformations (Haddouche et al., 2008) This is reflected in a mutation in the Steppe population and an increase in the phenomenon of the exodus of workers to cities in search of other activities than animal husbandry (Nedjimi and Guit, 2012).

The present work tries to contribute to the study of the age structure of breeders and the specific distribution of their classes by breeding techniques, to understand the trend of this dynamic in order to consider solutions for maintaining acquired skills.

Materials and methods

Our work is based on a field survey involving a sample of flock holders across the study area. In order to have a representative sampling, we used the CheckMarket platform, where we injected the number of the population concerned namely 6700 breeders (Budget Planning and Monitoring Directorate (DPMD, 2021)), choosing a 5% margin of error and 95% confidence. The resulting sample size is in the order of 364 individuals from the target population. Our fieldwork spanned from 04/05/2021 to 19/11/2021. The interpretation and analysis of the structures of the age pyramids were carried out by projecting the forms attributed to the most common ones of the Grafiq dashboard initiated by Quick MS society.

Data collection and preparation

In the course of our investigations, we have concentrated on the information which we consider useful and necessary for the characterization of livestock farming techniques, namely: lifestyle, profile, system and type. This information covers:

- The age of the holders of the herds.
- Categories of sheep heads in possession.
- The type of habitat.
- Nature, timing, destination and frequency of travel.
- Agricultural land ownership and cropping practices used.
- The nature of the feed supplied to the livestock.

Results and discussions

Distribution of livestock producers by age group

In order to have a graphical representation of the distribution of the different generations of breeders across the study area, we have broken down the numbers of holders of the surveyed herds by age group. This breakdown reveals that the dominant class is the 40–49 age groups, followed by the 50–59 age groups, while the 60–69 age group ranks third as shown in Figure 2. It is clear that the two classes (< 30 years and 30 to 39 years) grouped represent only 15% of our sample, which is equivalent to the rate recorded by the 70–79 year old class alone.

Age pyramid

Analysis of the age pyramid of livestock holders as shown in Figure 3 shows that the average

age is high (54 years). It is therefore a group of ageing farmers, which suggests a very high risk of losing know-how; this is a result to the economic and social changes affecting employment. The distribution of livestock by sex clearly shows the total absence of women in this field of activity.

Age structure by lifestyle

The distribution of breeders in the study area by lifestyle shows three groups as follows: nomadic, sedentary and transhumant. Transhumance is a traditional management of farmed animals specific to the Mediterranean countries and which consists in the complementary exploitation of resources between lowlands and highlands (Ruiz and Ruiz, 1986). For the Algerian transhumant trajectory, herders move in summer towards the North to feed their herds with stubble and agricultural residues (Bencherif, 2011), while during the winter, they move south to enjoy the desert grazing land favoured by the ambient temperature (Bencherif, 2011). Nomads are those who move continuously without a permanent home or farm, while there are other pastors who migrate during the seasons between a fixed base and distant grazing land in semi-nomadic conditions (Sonneveld et al., 2009). It is a way of life adapted to fragile areas that do not support sedentary or permanent occupation. Sedentarization is the replacement of the nomadic lifestyle by a sedentary lifestyle a result to economic and polit-

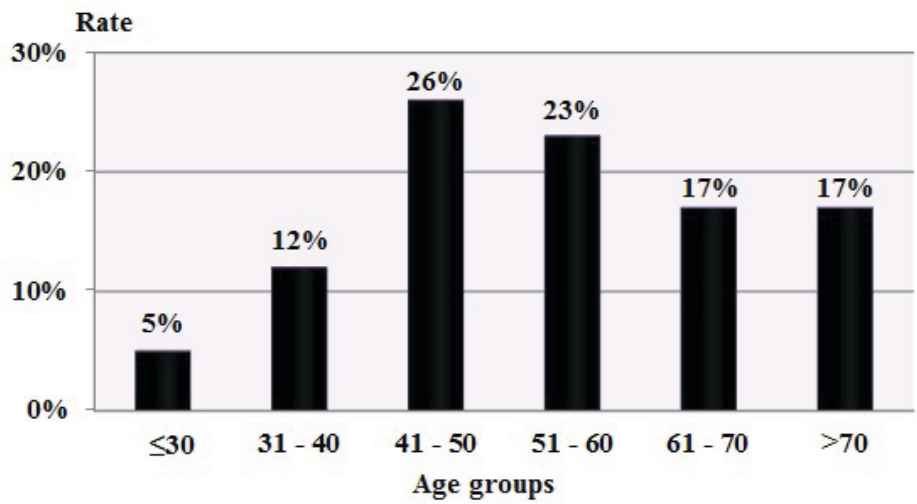

Fig. 2. Distribution of farmers by age group

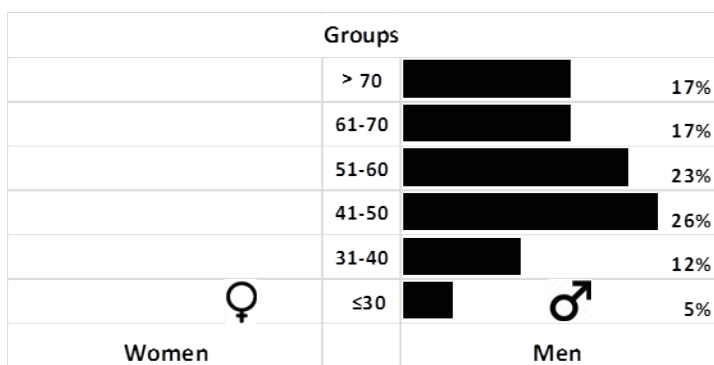

Fig. 3. Age pyramid of livestock holders

ical conditions (Yunjie and Lin, 2020). The tracing of age pyramids by breeding mode as shown in Figure 4 shows that transhumant have a form of «mushroom» with a large head and very thin base, This means that the mode is in sharp decline with a dominant class of practitioners over 70 years. This decline may be a result to disturbances affecting the territory and changes in the way of life of the rural population. For nomads, the shape of the pyramid looks a bit like a spinning top with a dominant class between 51 and 60 years old. This class seems high and could cause a massive loss of skills and knowledge related to this lifestyle. This risk of loss is possibly had to climate change combined with declining rangelands, therefore the uselessness of moving continuously. Sedentary persons have a more or less cylindrical shape whose regularity of classes is relatively balanced with a dominant age class between 41 and 50 years indicating that this mode includes more young people compared to other modes.

Age structure by livestock profile

The distribution of ages by livestock profile highlights the existence of three distinct livestock profiles: feeders, fatteners and a mixed profile (feeder-fattener). The profile of breeders is based on production in terms of animal number; their incomes are based on the early sales of lambs from 3 to 4 months (Bensmira, 2017). Fattener profiles include those interested in the weight component (Bensmira, 2017) and target the expansion of the size and weight of their animals for later sale. The breeder-fattener profile combines the two previous profiles: sheep and lamb breeders. The study of the age pyramids according to the profile envisaged shows that the "mixed" profile shows a form of a wider pear at the bottom given the large number of young people who are not yet specialized in production and that, probably, as a precaution and as a result of the lack of guarantees, they prefer to fatten and produce lambs at the same time. With respect to breeder, the shape of the graphic illustration is somewhat similar to a spinning top with a wider head as shown in Figure 5, which means that the profile of feeder operators suffers from a decline that could be caused by keeping lambs after birth to fatten them and then sell them to markets without intermediaries, because sedentarisation allows a relatively easy marketing is fast com-

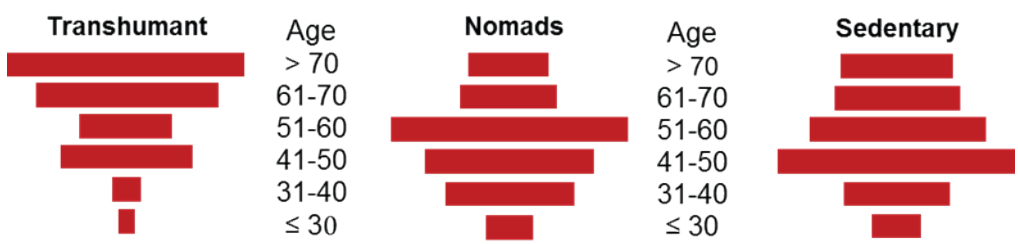

Fig. 4. Age pyramids by lifestyle

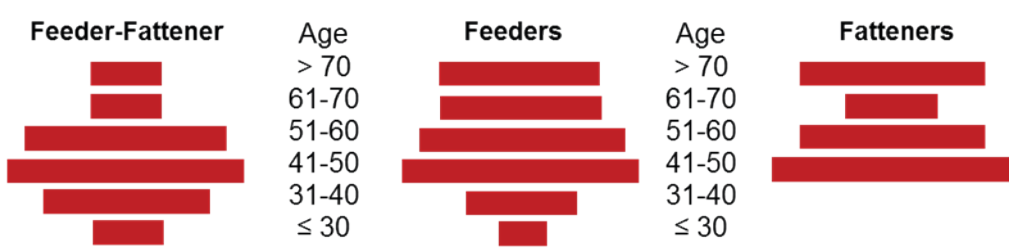

Fig. 5. Age pyramids by livestock profile

pared to other modes. Fattening has a more or less regular shape modelled on the shape of a cylinder, which shows a certain balance between the different age groups. Note the absence of classes under 40, this may be a result either to the need to mobilise preliminary financial resources generally absent among young people, or technical skills not mastered by them.

Age structure by livestock system

Data processing on livestock systems highlights two types: agro-pastoralism and pastoralism. Agro-pastoralism is a system in which livestock holders depend mainly on animal production in combination with certain cultural activities (Yunjie and Lin, 2020). While the pastoral system uses natural steppes to cover the feeding needs of herds (Senoussi et al., 2014). The analysis of the age distribution of the two breeding systems as shown in Figure 6 shows that the pastoral system has a form of a spinning top with a relatively large head; this indicates that breeders are experiencing a decline that could be explained by the erosion of inherent skills. This clear decline also explains the growing trend in the combination of livestock and agricultural practices. While for the agro-pastoral system, the age pyramid corresponds to a cylindrical shape with a remarkably wider base than that of "breeders", this can be explained by the tendency of the young towards the association of animal farming with agriculture.

Age structure by type of livestock

The classification of breeders according to the type of breeding used reveals that our study area has two types which are: semi-intensive and intensive. The intensive type is especially dedicated to the fattening of lambs and aims at the sale of the product to local markets (Shomo et al., 2010). It is a type of animal farming with high animal load in relation to the small area used, and where feed is supplied to the livestock on site (shed). The semi-intensive represents a mixed type of breeding, where breeders keep small flocks for domestic consumption and for additional income (Shomo et al., 2010). 80% of livestock feed requirements are from cereals and crop residues (Yerou, 2012). It is a type of breeding that combines the use of rangeland and the supply of food of different natures. Note the absence of extensive husbandry in our study area. the comparison of age pyramids by animal husbandry type as shown in Figure 7 shows that the intensive type is more or less balanced with a clear dominance of the lower classes compared to the other three classes that exceed 50 years; It is explained by the massive use of this type by young people which follows an increasing trend.

The semi-intensive type has a clear heterogeneity as indicated by its shape with a wider appearance at the top, this explains the ageing of breeders in this category which is not really attractive to young breeders as its small base illustrates.

Conclusion

The present paper proves and confirms that the mobility of herds is clearly declining, in particular the transhumance which suffers from a clear regression and which risks disappearing according to the dynamics of the related age groups, Knowing that this mode is most appropriate for

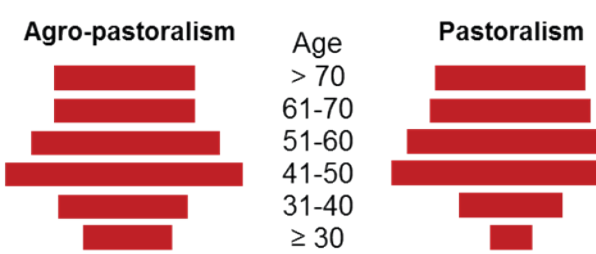

Fig. 6. Age pyramids by livestock system

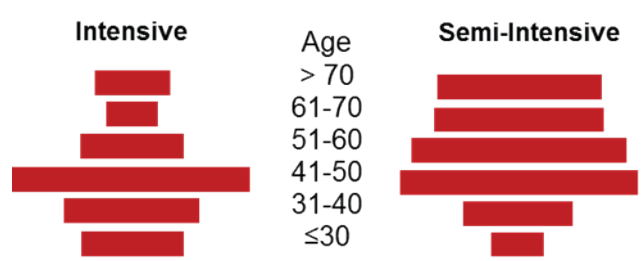

Fig. 7. Age pyramids by type of livestock

the climatic conditions and steppe biomass of the study area. The thematic analysis of the age pyramids of the breeders (by lifestyle, system and type) shows that the relationship between livestock farming and land ownership is becoming increasingly close; Sedentarization, intensification of animal farming and its association with agriculture are following an increasing trend. So the creation of agro-pastoral scopes could serve this purpose, because it allows producers, at the same time, to settle down and intensify their breeding while practicing some agricultural activities in a legal and controlled framework. The analysis of the age pyramids by breeding profile shows that young people are attracted to mixed breeding, preferring to ensure, simultaneously, the reproduction of lambs and fattening.

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