

The Transhumance of Sheep Herders in Steppe: Cost Reduction or Inevitable Adaptation?

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Abstract: According to the national official data in Algeria, Djelfa province is the top red meat producer in the country, 44554 tons in 2014, representing 9.16% of the national production. It is produce the majority of sheep meat with about 14% of the relevant national production. 3242760 sheep heads are located in Djelfa representing 11.66% of the national sheep flock and more than 74% of sheep herders (finishers and breeders) This study focuses on the grazing areas in Algeria and aims to this study aims to investigate the reasons behind the herders' transhumance (transhumant pastoralist) between autumn 2014 and summer 2015. Based on survey data of 52 sheep herders, this study illustrated that the majority of the herders are transhumant and the transhumance production system is the prevailing system for sheep farming in the investigated region. This is mainly due to the ratio of own land and the size of sheep heads per herder. The transhumant herders move over the private and public pasture lands and crossing between 100 to 800 km (and sometimes more than 800 km) to seek the feeding of their flocks.

Keywords - Adaptation, steppe, sheep herders, transhumance, pastoralism.

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I. Introduction

Algeria is the Africa's largest country covering an area of 238.174 million hectares. The total agricultural land in the country is estimated by 42.888 million hectares, of which only 8.465 million hectares, mainly in the northern regions, is currently used. The agricultural labor is estimated by 1 million inhabitants representing 25 percent of the total labor force. Livestock herders in the country equal about 125.000 herders mainly for sheep. Nearly 80% of the rural populations in Algeria rely on sheep farming as a permanent source of income. Furthermore, sheep farming provides 100% of the national wool production and 30% of the skin production [1]. The objective of this study is to provide empirical insights about the grazing areas and to investigate the reasons behind the herders' transhumance (transhumant pastoralist) between autumn 2014 and summer 2015.

II. Methodology

A data survey was conducted among sheep herders in the region of Ain El Ibel, 35 km south of the Djelfa province. Ain El Ibel is spread over 56237 hectares where 16.74% of Djelfa's sheep flock (543000 head) is concentrated. Thus, it has the heights sheep population at the national level; moreover it comes first in terms of red meat production (mainly sheep meat). In 2014, 6373 tons of sheep-meat was produced in Ain El Ibel representing 16.44% of the province production.

The sampling procedure was done based on statistical methods for reliable results. Indeed, for determining an adequate sample size Bernoulli's sampling was followed taking into account the aspects of representativeness, consistency and accuracy. Sample of 52 sheep herders were randomly selected.

III. Results And Discussions

3.1. Personal characteristics

According to their age, the herders were divided into two groups.

The first group includes herders older than 50 years old. This category represents 57.69% of livestock farmers. The majority of the herders in this group were illiterate (90%) and the others only attended Koranic

schools. Regarding the herders' leadership, 83.33% are owners, of which 70% by inheritance. The others are originally shepherd owner and shepherds, 13.33% and 16.67%, respectively.

Herders between 35 and 50 years old are in the second group. They account for 42.31% of the interviewed herders. What is interesting that herders in this group have better education level with 13.65%, primary, intermediate or secondary education. This reduced the illiterateness among the herders in this category to 68.18%. Herders lower than 35 years old account about 10%, half of them are highly educated.

3.2. The breeder's activity

The majority of the herders (96.15%) in the study are breeders who do not follow the finishing practices, whereas only 3.85% of the herders are running lambs and young rams finishing in parallel with sheep breeding.

Regarding to herders' experience, the results show that majority of the herders (90.38%) are experts in sheep farming over 10 years, while the rest has experience between 5 and 10 years

The Chamber of Agriculture plays a significant role for supporting the herders with official breeder card and thus providing them with the subsidized amount of barley. This reason explained why almost all of the herders (96.15%) in our study declare their business at the Chamber of Agriculture. Only 3.85% of the herders are running their flocks without official declaration to the relevant public institutions. Those herders do not observe any benefits from such declaration and not expect any support from the state. Moreover, they are suspicious of the tax issues. On the other hand, droughts' conditions force them to declare their business in order to obtain subsidies.

3.3. Livestock and land ownership

Our study revealed that the sheep farming capacity is the most effective characteristics of interviewed herders. Almost 64% of the herders operate a relatively large flock (250 - 750 head). Whereas, about 29% have flocks with lower than 250 head. A few numbers of herders are running flocks with higher than 750 head. Furthermore, the study showed that all herders do not have land. This remarkable result explains the reason behind the herders' behavior of moving the livestock seasonally from one grazing ground to another.

3.4. The transhumance of herders

The result illustrated no significant differences between the transhumant herders and the other type of breeders in terms of the production cost of the seven-month lambs as well as the production cost of young rams of twelve months [1, 2, 3, and 4]. The herders' transhumance in our case study depends on the ratio of pasture availability and the size of sheep flocks. The transhumant herders are forced to adopt the transhumance production system due to the large size of their flocks and the same time the absence of owned land. The herders' transhumance has occurred by either free-cost or rent-paid land. The governmental lands are freely for grazing, while the lands within private owners are rented by herders.

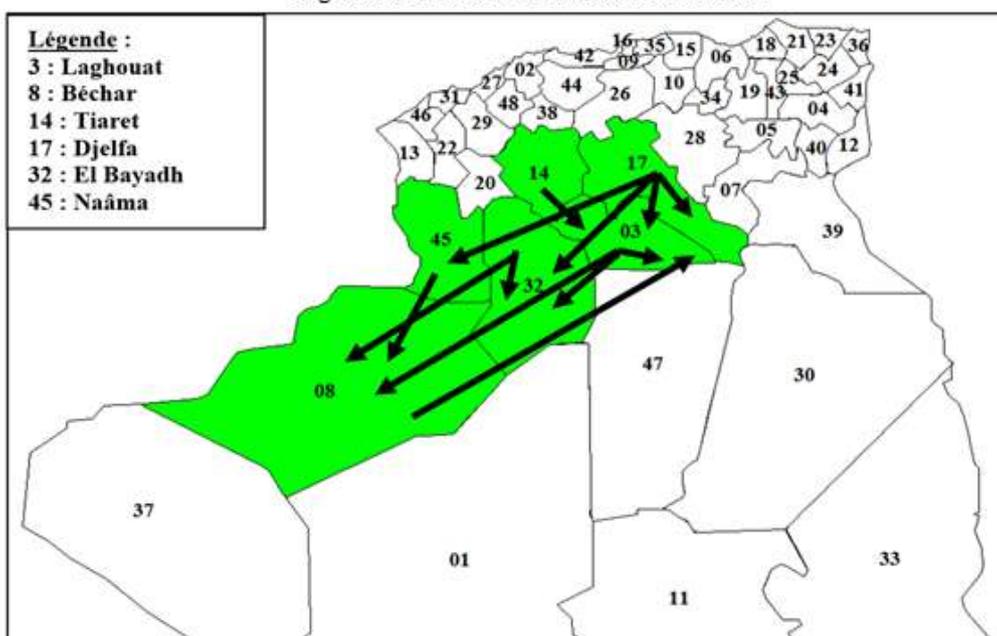
3.4. 1. The period from the autumn 2014

The first destination of the herders during this period was to El Bayadh Province; about 55.77% of the transhumant herders landed this wilaya, 72.41% of them came from Djelfa by traversing a distance varying between 100 km to 450 km. About one-third of the herders were already in El Bayadh, but they only changed the grazing location by about 150 km.

The Laghouat Province is second preferred destination for the herders. 68.75% of the herders in this province came from Djelfa (crossing 40 - 200 km), 6.25% came from Bechar Province(200 km) and the same percentage came from Tiaret Province (100 Km). The other herders in Laghouat were already in the province, but they changed the grazing location by about 100 Km.

Bechar Province comprises about 6% of the herders who came from El Bayadh (400 km), Laghouat (800 Km) and Naama (600 Km). Other herders (5.77%) preferred to stay in Djelfa and move within an area of 80-200 km.

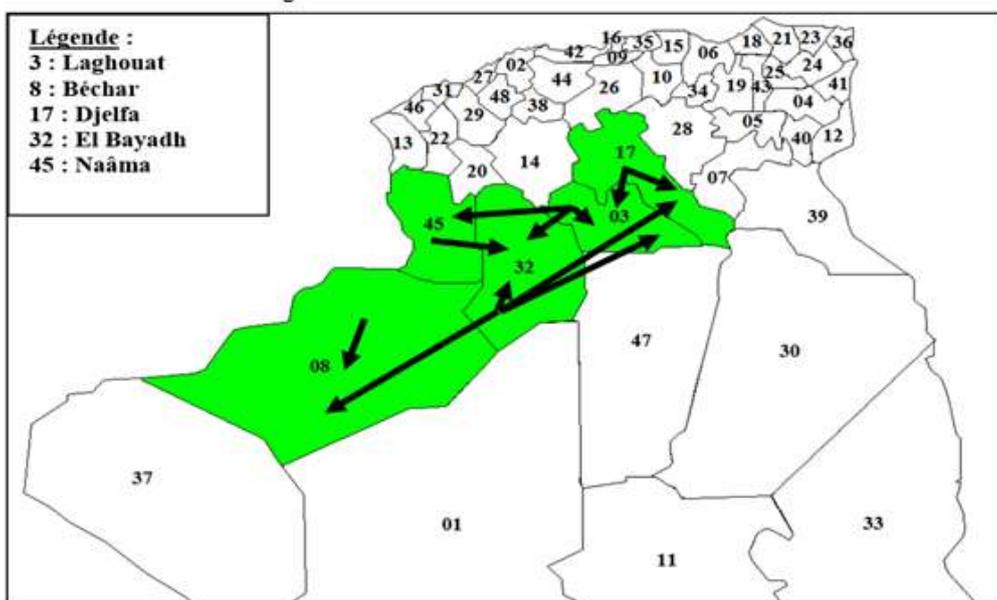
Figure 1. The transhumance in the autumn 2014



3.4. 2. The period of winter 2015

In the winter of 2015, 75% of the herders were in El Bayadh of which 66.67% were in this province since the autumn 2014 but they only changed the grazing location within the province and 30.77% came from Laghouat. All herders in El Bayadh crossed a distance ranging between 50 and 300 km.

Figure 2. The transhumance in the winter 2015

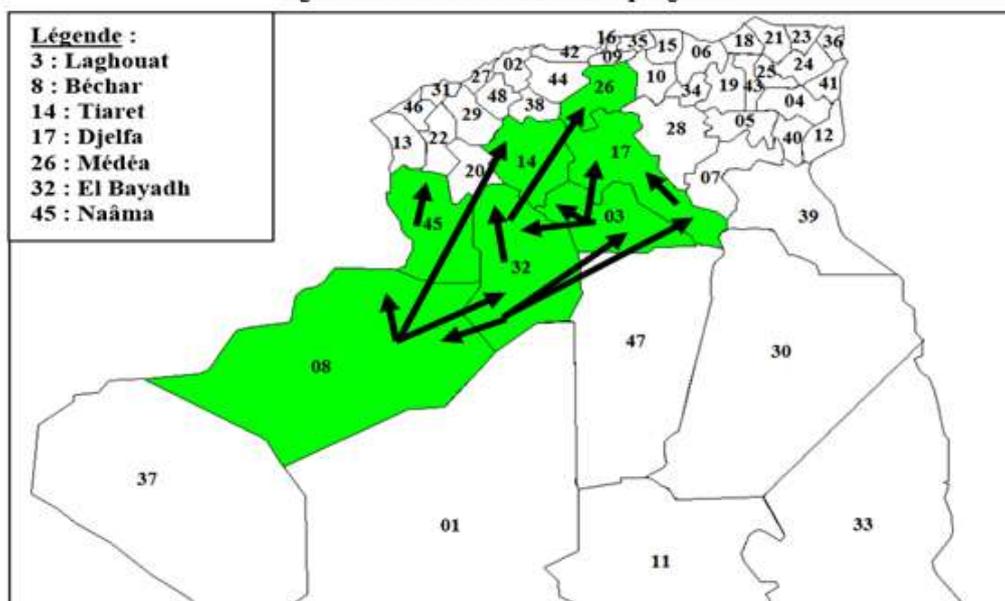


It was noted that there are other herders are still stayed in their original provinces (Djelfa, Laghouat and Bechar). They represent in whole 15.39% of respondents.

The remaining transhumant herders were moved from the Djelfa and Laghouat to El Bayadh (10 to 100 km), and from El Bayadh to Djelfa and to Bechar (400 to 800 km) and from Laghouat to Naama.

3.4. 3. The period of spring 2015

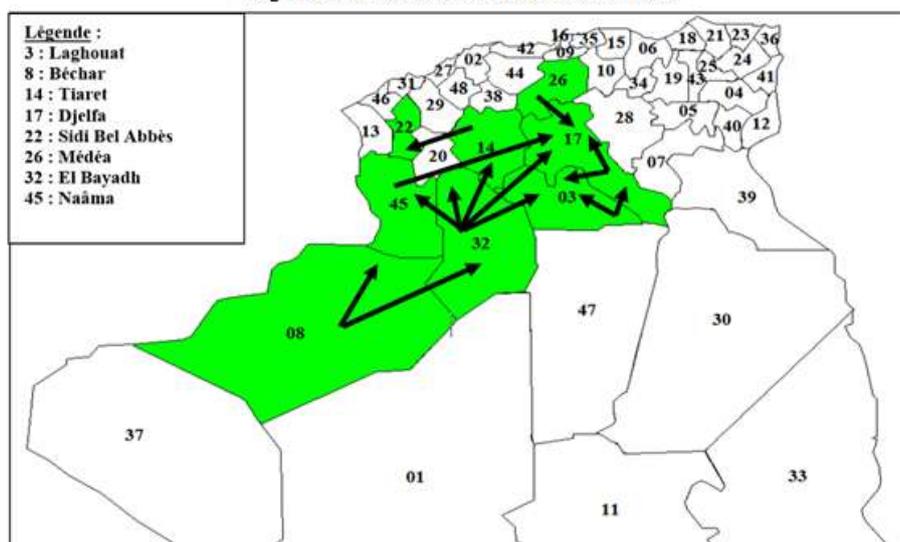
Figure 3. The transhumance in the spring 2015



The majority of the herders (69.23%) settled in El Bayadh, of which 91.67% were keeping the sheep farming in this province since winter 2015, and the others came from Laghouat or Bechar. 15.38% of the herders settled in Djelfa. One third of them have not changed this location during the spring, while the others came from Laghouat and El Bayadh. Regarding the Laghouat herders, two thirds were in this province since the winter, others came from El Bayadh. Herders of Medea and Tiaret provinces came mainly from El Bayadh and Bechar. Herders who were in Naama did not change the province during this period.

3.4. 4. The period of summer 2015

Figure 4. The transhumance in the summer 2015



In summer 2015, the majority of the herders (48.08%) returned to Djelfa due to the extreme temperature level and water scarcity, while others preferred to return to Laghouat Province (7.69%), El Bayadh (34.62%), Nâama, Tiaret and Sidi Bel Abbès.

IV. CONCLUSION

The large number of sheep heads operated by the herders and the scarcity of owned land has a significant impact on the herders' transhumance. The herders' transhumance in our case study depends on the ratio of pasture availability and the size of sheep flocks. The transhumant herders are forced to adopt the transhumance production system due to the large size of their flocks and the same time the absence of owned land. The herders' transhumance has occurred by either free-cost or rent-paid land. The governmental lands are freely for grazing, while the lands within private owners are rented by herders.

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