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Livestock Breeders' Conflicts in the Steppe Rangelands of Naâma Region (Western Algeria)

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Abstract. Sheep farming represents a very important activity in the Algerian steppe, unfortunately it is in a critical situation following climate changes, decreases in rangelands and the rise in the prices of livestock feed, this has created conflicting situations between breeders. The competition for access to steppe spaces and the use of natural resources are at the origin of several conflicts between the actors of the steppe. In this article, we tried to present in a brief way the nature and rate of existing conflicts between pastoralists, and compliance with current legislation which aims to protect the plant cover and soil. The approach taken to carry out this analysis is based on a field survey whose target population is the holders of the herd. The sample size exceeds 364 surveyed spread across the 12 municipalities in our study area. Our work shows that one-fifth of respondents suffer from conflectual situations, either against a legal person or natural persons, while four-fifths endure no strife. In addition, the comparison between two periods (2010 - 2014 and 2015 – 2019) shows that the average number of established and trained offence report by forest administration concerning "illicit grazing" had doubled. The solution consists in cleaning up the steppe against illegal monopolies, accompanied by awareness-raising activities for a better awareness of residents to change their bad behavior. Finally, the competent authorities are required to find alternatives to enable farmers to carry out their activities properly.

Keywords: conflict, livestock breeders, steppe, Wilaya of Naâma

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1. Introduction

The Algerian steppe is of great interest in terms of vegetation, mainly in the Naâma area. This steppe vegetation is usually composed of annual and perennial grasses and other herbaceous plants, as well as shrubs and small trees [1]. The Naâma region is a steppe region characterized by an agro-pastoral vocation where sheep farming is an important resource for a large margin of the rural population [2]. Faced with the recurrent shortage of spontaneous forage offered by the Algerian steppe especially from the west [3] - [4], and in the face of rising prices for concentrated

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feed, the pastoralists of the wilaya of Naâma (Western Algeria) are often forced to graze illicitly in the restricted area, to meeting their food needs.

Like all steppe areas, the land tenure system in the Naâma region has undergone profound changes and upheavals over the centuries [5]. The competition for access to steppe spaces and the use of natural resources are at the origin of several conflicts between the actors of the steppe [6]. These conflicts are generally summarized in the right of grazing, the right of way of the herds and the right to plow. In this context, we will try to present in a brief way the nature and rate of existing conflicts of interest between some actors of the steppe to contribute to studies related to behavior of pastoralists disrespectful to legislative rules and the different operations which are aimed at the rehabilitation of the steppe area of the Naâma Wilaya.

2. Methods

The approach taken to carry out this analysis is based directly on a field survey whose target population is the holders of the herd. Our sample size exceeds 364 surveyed spread across the 12 municipalities in our study area. We opted for massive movements and circulations through the territory of the Naâma region where the sample is composed of breeders encountered randomly. However, the movements were made to cover the entire study area. Our survey was implemented in the form of an individual interview by creating a situation of interaction and exchange with the breeder to obtain the necessary data. In order to have a representative study, we calculated the sample size using free applications [7] with the choice of margin of error (5%) and confidence interval (95 %) the most often used [8] and the statistical processing was carried out by the software R [9]. Our work lasted 7 months (May 2021 to November 2021). Recall that this work was carried out without going into details for initiation of public proceeding before the courts.

2.1. Materials

As a result of the last administrative division created by Law 84-09 of April 4, 1984, the wilaya of Naâma (Fig. 1) is made up of seven (07) Dairas which regroup twelve (12) Communes, it is located between the Tell Atlas and Saharan Atlas, and it covers an area of more than 29,800 km² with an estimated population of 289,045 inhabitants at 31/12/2019 [10]. The main activity of the population is animal husbandry, the number of breeders estimated at 6700 (BPMD Naâma 2020) divided between pastoralists and agro-pastoralists. After analyzing the data from this survey, the breakdown of pastoralists according to the livestock system reveals that pastoralism constitutes about two-thirds of the surveyed sample, or more than 65%. The agro pastoral system represents 35%.

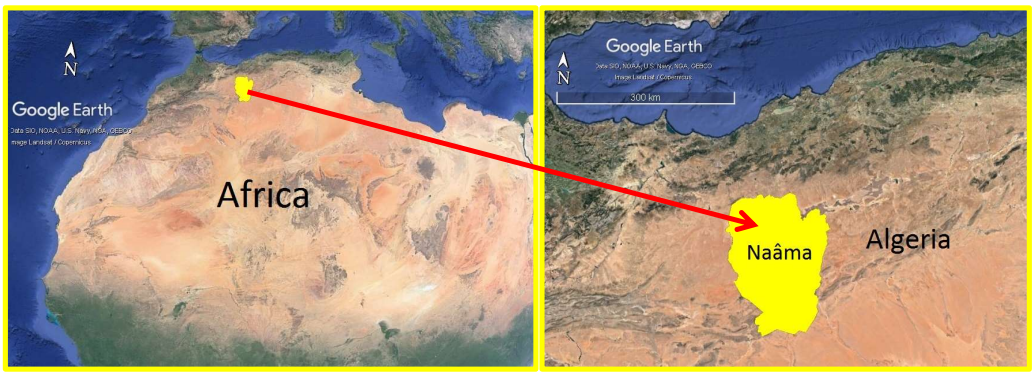

Figure 1. Location of the Study Area (Wilaya of Naâma) [11].

3. Results and Discussion

3.1. Conflict

Feeding livestock in the study area is such a complicated equation; the satisfaction of the food needs of the herds seems very difficult to resolve in view of the decline and disappearance of the natural forage resources and the increase of the prices of the concentrated food. The consumption of live grass by livestock remains a target for all livestock producers for economic and welfare reasons, what makes grazing areas of conflict theatre.

According to our investigation which aims to estimate the rate of existing conflicts of interest between breeders or groups of breeders (Fig. 2), we have noticed that 81 % of the breeders have no conflict of interest with their neighbors, while 19 % of respondents say they are suffering of conflict situations of which 18 % complain of natural persons (pastoralists, agro-pastoralists or farmer) and only 01 % complain of legal persons.

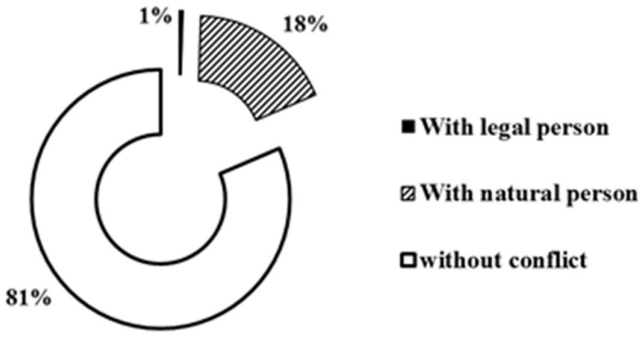

Figure 2. Rate of Existing Conflicts

3.2. MFA of Age, Level of Education, Conflict

Through figure 3, the inertia of the first dimensions shows if there are strong relationships between variables and suggests the number of dimensions that should be studied. The first two dimensions of analyze express 69.43 % (52.15 + 17.28) of the total dataset inertia ; that means

that 88.75% the variables cloud total variability is explained by the plane. Multiple factor analysis (MFA) is a multivariate data analysis method for summarizing and visualizing a complex data table in which individuals are described by several sets of variables [12]. According to the MFA (Fig. 3 and 4), conflicts depend slightly on age progression, this weak correlation with the aging process, which can be accompanied by a mental disorder, may be justified by "a change in behavior, with a sense of hostile experience and aggression [13]. Studies in Africa reveal that rural farmers have aged and need young people to take over from them [14]. While the level of education has a negative correlation with the number of conflicts recorded.

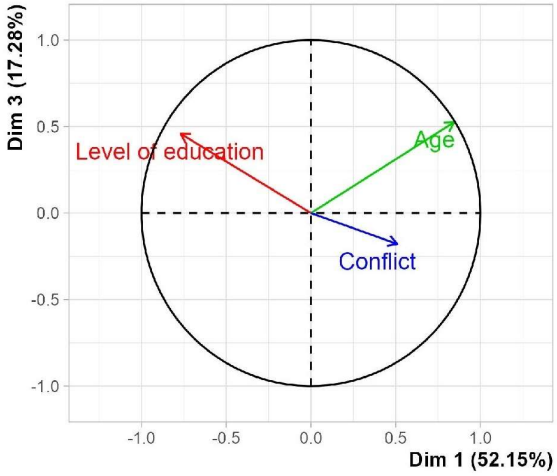

Figure 3. Correlation Circle (MFA: Age, Level of Education, Conflict)

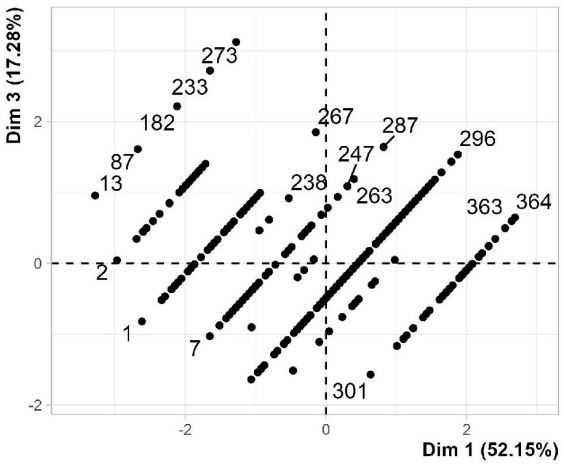

Figure 4. Graph of Individuals (AFA: Age, Level of Education, Conflict)

3.3. MFA of Livestock Size, Agriculture Area, Conflict

Based on the variables livestock size, agriculture area and conflict, multiple factor analysis (MFA) shows the existence of certain dependencies (low correlation) between livestock size and conflict (Fig. 5 and 6). The first two dimensions of analyze express 73.06 % (38.39 + 34.67) of the total dataset inertia this may be due to competition between breeders for access to rangeland to meet

forage requirements of herds. Note the absence of a link between the agricultural areas held and the number of conflicts recorded.

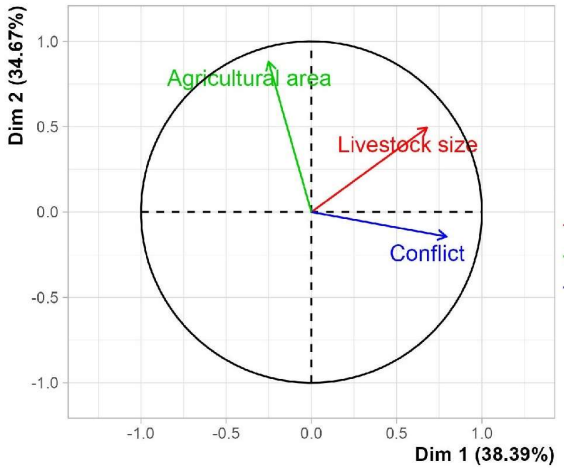

Figure 5. Correlation Circle (MFA of Livestock Size, Agriculture Area, Conflict

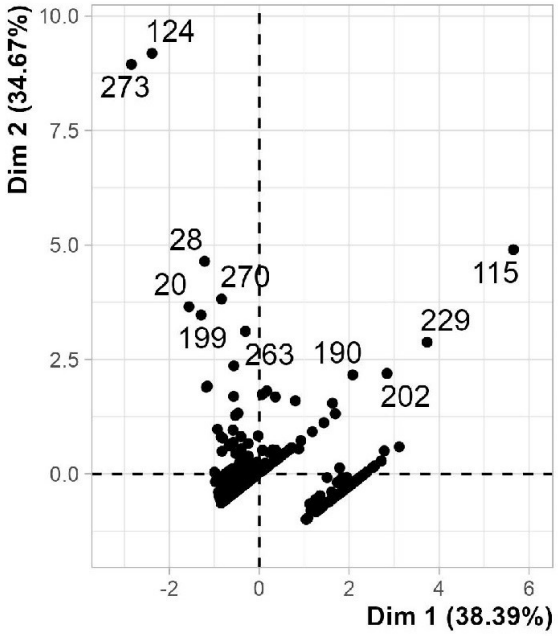

Figure 6. Graph of individuals (MFA of Livestock Size, Agriculture Area, Conflict)

3.4. Pastoralist's Behavior

Algeria has instituted several laws and texts to protect natural areas and grazing areas against aggression or diversion, several sectors ensure compliance with legislative provisions through legal proceedings. To discuss this subject, and in order to highlight the volume of offense of pastoralists, we have chosen as an example a single offence so-called "illicit grazing", with only department namely Conservation of the Naâma wilaya forests. The data from this analysis during the period between 2010 and 2019 (Forest conservation of Naâma) show that the sector offence

reports and issued notices approximately 54 offences annually throughout the territory of the wilaya, against delinquent breeders whose herds have been apprehended in prohibited areas.

Mayer's linear adjustment method consists of sharing a cloud of points arranged in the order of their abscissas, by k points, n consecutive points being replaced by their average. This type of adjustment corrects imperfections between close measurements [15]. Following Mayer's method that dividing the data series into two equal parts, in order to draw "fitted line plot" which goes through the two middle points (A and B), we have divided the concerned decade in two parts of five years each: 2010 - 2014 and 2015 - 2019. The comparison between these two periods (Fig. 7) shows that the average number of established and trained offence report had doubled, to reach 33 report during the first five-year period, and rise to 75 during the second, this may express the acute needs of the forage supply and research in all ways to cover food needs "increased" of herd, if it is necessary even with illegal manners.

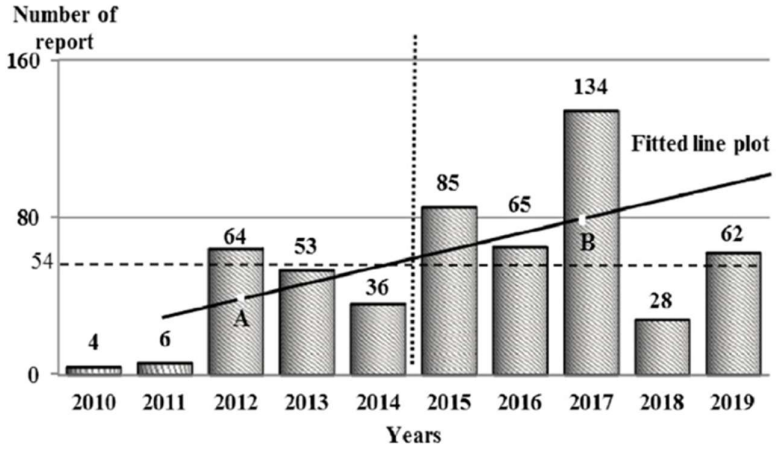

Figure 7. Number of Offences Against Breeders

It should be noted that, in addition to forest administration, there are other departments that have jurisdiction to prosecute guilty ranchers.

4. Conclusion and Recommendation

Characterized by its vastness, the region of Naâma represents an area not easy to control or to master, of which several conflicts can be created following ambitions of the local population that do not cease to seek to hoard the steppe land. The failure to comply with the various rehabilitation operations in the steppe areas, the repeat assaults and violation of the regulations in force because of the offences committed by the breeders, are practices that impede the sustainable management of the land in question

The sanitation of the steppe area and free pastures remain essential and urgent by the implementation of the necessary legal measures to recover the diverted land and put an end to bad

practices compromising the sustainable management of the territory. In this context, awareness-raising activities are strongly recommended for a better awareness, in order to change the bad behaviors of certain actors. For their part, the competent authorities should find alternatives that could help these pastoralists and agro-pastoralists to carry out their activities in satisfactory and sustainable conditions. Governments must give particular importance to the consultation of the consent of pastors as a stakeholder in the decision-making of land use to avoid any possible conflicts and to find agreements between them, which will facilitates the management of the territory.

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REFERENCES

[1] A. Benaradj, H. Boucherit, A. Bouderbala, and H. Okkacha, "Biophysical effects of evapotranspiration on steppe areas: A case study in Naâma Region (Algeria)," In Climate Change in Asia and Africa-Examining the Biophysical and Social Consequences, and Society's Responses, IntechOpen, 2021, doi: 10.5772/intechopen.97614.

[2] A. T. Youcefi and A. Marouf, "Structure and age dynamics of breeders in the western Algerian steppes (region of Nâama)", *Ikonomika I upravlenie na selskoto stopanstvo,* vol. 68, no. 1, pp. 32-37 (Bg), 2023.

[3] F. Z. Bahlouli, A. Djabeur, A. Kefifa, F. Arfi, and M. Kaid-Harche, "Degradation of Western Algerian Steppes Lands: Monitoring and Assessment," *Indian Journal of Ecology,* vol. 45, no. 2, pp. 235-243, 2018.

[4] A. Moulay, K. Benabdeli, and A. Morsli, "Contribution a l'identification des principaux facteurs de degradation des steppes a Stipa tenacissima du sud-ouest Algerien," Mediterránea. Serie de Estudios Biológicos. Época II, n. 22, pp. 149-188, 2011, ISSN 1130-6203.

[5] A. T. Youcefi and A. Marouf, "Impact des politiques foncières sur la typologie d'élevage et la dynamique des parcours steppiques dans la région de Naâma (ouest algérien)," *Revue d'élevage et de médecine vétérinaire des pays tropicaux,* vol. 76, pp. 1-6, 2023.

[6] E. Vall, P. Salgado, C. Corniaux, M. Blanchard, C. Dutilly, and V. Alary, "Changes and innovations in livestock systems in Africa, special issue," *INRA Prod. Anim,* vol. 27, no. 2, pp. 161-174, 2014, doi: https://doi.org/10.20870/productions-animales.2014.27.2.3064.

[7] CheckMarket, "Sample Size Calculator," page consulted September, 15, 2021, url: https://fr.checkmarket.com/calculateur-taille-echantillon/ (Fr).

[8] F. D. Giezendanner, "Taille d'un échantillon aléatoire et Marge d'erreur," *Genève: Instruction publique, culture et sport Service Écoles-Médias,* p. 22, 2012.

[9] R. Core Team, "R: A language and environment for statistical computing," R Foundation for Statistical Computing, Vienna, Austria, url: https://www.R-project.org/.

[10] Budget Planning and Monitoring Directorate (wilaya of Naâma), Statistical Yearbook of the Naâma Wilaya 2020, Edition April 2021, 132. (Fr).

[11] Google Earth Pro 7.3.6.9345, Version date Thursday 29 December 2022 22:50:09 UTC Moteur de rendu, OpenGL.

[12] STHDA Statistical tools for high-throughput data analysis, (page consulted January, 05, 2024), url: http://www.sthda.com/english/articles/31-principal-component-methods-in-r-practical-guide/116-mfa-multiple-factor-analysis-in-r-essentials/.

[13] E Mental health and aging. Santé mentale et vieillissement PSYCOM url: http://www.eps-erasme.fr/Ressources/FCK/SanteMentaleEt_Vieillissement_WEB.pdf (Fr).

[14] K. A. Adeloye, D. O. Torimiro, and K. B. Oladejo, "Effect of Fulani Herdsmen Grazing Activities on Food Crop Production among Farm Youth in Nigeria," *Indonesian Journal of Agricultural Research,* vol. 6, no. 1, pp. 1-11, 2023, doi: https://doi.org/10.32734/injar.v6i01.8844.

[15] EssayBiz. All you need to know about smart prosthesis, (page consulted January, 05, 2024) url: https://essay.biz/article/all-you-need-to-know-about-smart-prosthesis.