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ASSESSMENT OF SEDENTARY AND MOBILE PASTORALISM DYNAMICS IN THE REGION OF DIFFA (NIGER)

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Abstract

This paper builds on the article entitled “Pastoral dynamics in the Region of Diffa: descriptive analysis of livestock capital” (Laouali and *al*., 2013). In view of its agro ecological characteristics, Diffa is a largely pastoral region in Niger. Livestock practiced by more than 95% of the population, is the dominant economic activity of local communities. It contributes around 55% of the annual GDP of the Region. To assess and understand the pastoral dynamics in the Region, a survey involving 300 households (150 households with sedentary herds and 150 households with mobile herds) was conducted during the first half of 2012. The paper attempts to capture, from the responses of households surveyed, livestock trends in the Region of Diffa over a period of six years (2007 to 2012). Analysis of results, at least regarding households who provided comprehensive responses, shows reduced livestock over the relevant period with variances according to species. Data cross analysis highlights the occurrence of recurrent fodder deficits, attributable to a series of annual rainfall deficits as well as animal diseases as the main cause of reduced sizes of the herds of households surveyed.

Keywords: *Pastoral System, Diffa, Niger, Dynamics*

Introduction

Livestock, with more than 37 million heads of animal, is practiced throughout Niger according to agro climatic parameters. This activity significantly contributes to the budgets of Nigerien households (around 25%) and significantly meets their food needs (Republic of Niger, 2003; *Save The Children*, 2009, Republic of Niger, 2013). Livestock sector is the second most important source of export earnings (21% of export revenues) of the country after uranium. It represents 62% of agricultural export products and contributes some 11% to the GDP of Niger (Republic of Niger, 2013).

However, various natural (rainfall, silting of rangelands, etc.) and man-made constraints severely hamper pastoral production systems nationwide, including in the Region of Diffa. In this largely pastoral Region, 95% of communities practice livestock as their main economic activity or secondary activity after agriculture. The Region has more than 3 million heads of animal (i.e., 10% of the national livestock) composed of bovines, sheep, goats, camels, donkeys, horses (Republic of Niger, 2008a).

To understand pastoral dynamics in the Region of Diffa, in the face of such constraints which has increasingly become structural over the years, 300 households were surveyed during the first half of 2012. After a reminder of the environmental framework and methodology used, paper will first made an overall analysis of recorded livestock trends and then livestock trends according to species, on the one hand, and compare general trends to highlight variances and identify key determinants, on the other hand.

Natural framework

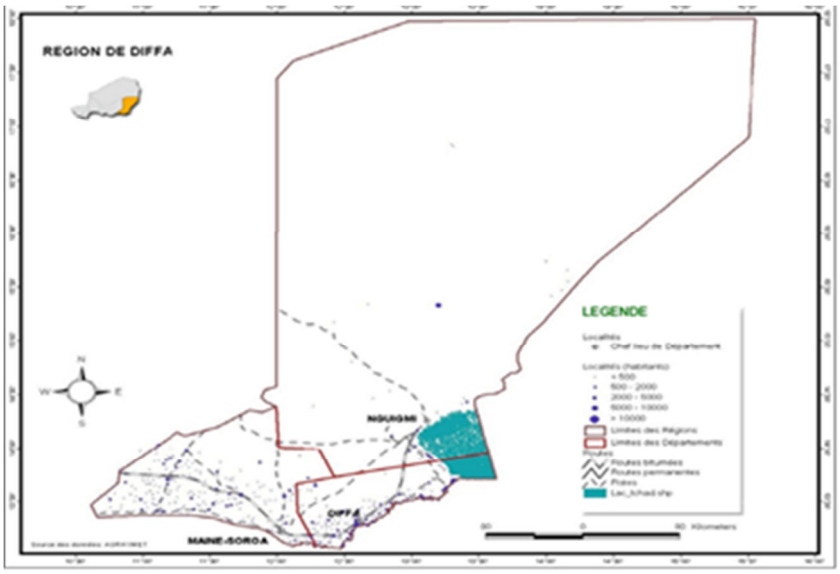

Figure 1: Region of Diffa (source: Republic of Niger, 2008b).

Located in the extreme East of the Republic of Niger, between longitude 10° 30’ and 15°35’E , latitude 13°04’ and 18°00’N, the Region of Diffa covers a surface area of 156,906 Km2 (figure 1). This Region straddles a Saharan Sahelian zone in the North and a Sahelian zone in the South.

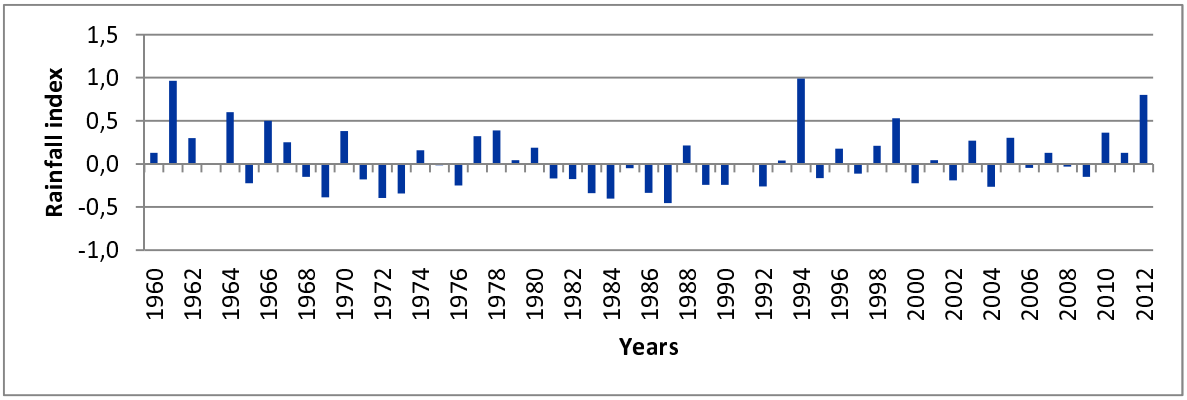

Figure 2. Rainfall variation in the Region of Diffa from 1960 to 2012 Source: NSI data (2010, 2013).

The Region of Diffa is subjected to high climate variability, characterized by an increasingly constant succession of dry spells (figure 2). Such climate variability engenders recurrent shocks characterized by major fodder deficits for an extensive livestock system. On average, 2 out of 3 years recorded deficits between 2005 and 2013 (figure 3).

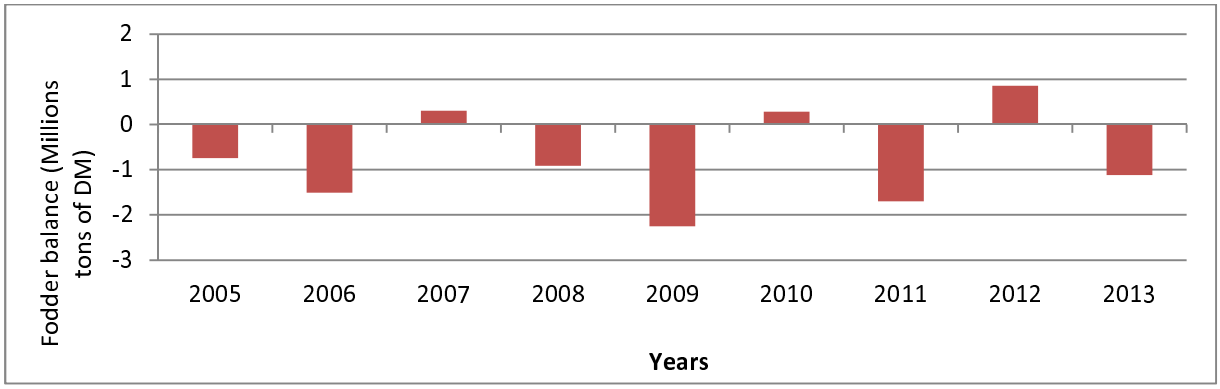

Figure 3. Changes in fodder balances in the Region of Diffa, from 2005 to 2013 Source: DREIA Data

Materials and method

The study area was divided into three survey zones (pastoral depressions zone, Lake Chad zone and Komadougou zone) based on agro-ecological parameters.

- The pastoral bowls zone: this is a largely pastoral zone is located between 50 to 250 mm/year isohyets (Saharan Sahelian region).
- The Komodougou zone: It is located in the South of the Region of Diffa and receives 250 to 300 mm of rainfall per year. This is an agro pastoral zone.
- The Lake Chad zone: It is located in the extreme East of the Region of Diffa in Lake Chad basin and receives 250 to 300 mm of rainfall per year. This is an agro pastoral zone and a retreat area for pastoralists during the dry season.

Sampling and conduct of the survey

The sample included 300 households (150 households with sedentary herds and 150 households with mobile herds) selected in a reasoned way based on 100 households per survey area. The survey was conducted from 10 February to 5 April 2012, i.e., over a period of some 45 days (Cf. Abdoulkadri et al., 2013). The data subject of this paper focus on the retrospective statements made by households surveyed on the numbers and species composition of their herds over the 2007 to 2012 period. However, this exercise was quite difficult, as very few households could provide useable responses in this regard.

Results and discussion

The results of the survey show that out of the 299 herds surveyed, only 50 households could trace changes in their cattle herds over the relevant period; 55 households for sheep herds; 49 households for goats and 13 households for camels. The reduced size of the sample does not allow analysis per agro ecological zone. Thus, this overall analysis will be limited the livestock of households interviewed according to livestock system (sedentary and mobile), on the one hand, and according to species, on the other hand.

Trends in livestock surveyed

Figures 4 trace changes in the herds of respondent households, between 2007 and 2012. Figure 4a shows that the numbers of livestock are constantly decreasing for all species. From a total number of 6,418 heads of cattle (around 2,421 Tropical Livestock Units) in 2007, livestock decreased to 2,965 heads (around 1,287 TLUs) in 2012, i.e., a decrease of about 53.8% over the period under consideration. This decrease was more pronounced between

2009 and 2010 when livestock recorded a decrease of about 39.6%. However, it should be noted that between 2008 and 2009, despite its decreased numbers, livestock recorded a slight increase in terms of TLUs. This could be attributable to an increase in the numbers of large ruminants while the number of small ruminants decreased.

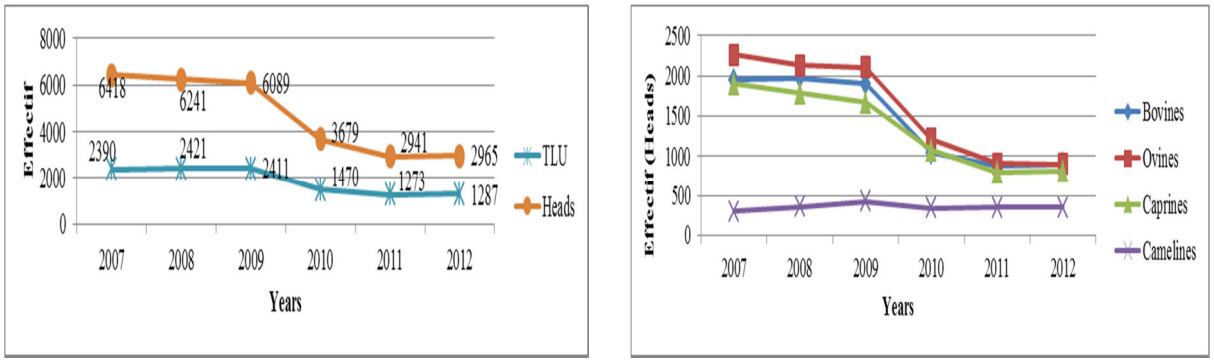

Figure 4. Livestock trends between 2007 and 2012 (Heads)

Figure 4b trace herds' evolution according to species between 2007 and 2012 to better assess the situation. This figure shows the level of loss according to species. Thus, the number of camels increased from 301 heads (or 301 TLUs) in 2007 to 421 heads (or 421 TLUs in 2009, i.e., an increase of about 40%. At the same time, the number of small ruminants reduced by around 10%. The number of cattle decreased by some 2.7%.

On the contrary, between 2009 and 2010, all species recorded losses. Cattle (45%) and sheep (42%) were the most severely affected by drought experienced in the area during the 2009-2010 pastoral seasons. This season recorded an important fodder deficit (Cf. figure 3). Goats (35%) and camels (18%) were relatively less affected.

Sedentary herds'evolution

Analysis of both sedentary and mobile herds' evolution makes it possible to compare and better understand the phenomenon. For sedentary herds, in view of the low number of camels per household (less than 1 dromedary per household, on average), the exercise only focused on cattle, sheep and goats. The number of households who gave full responses on the period under consideration was 23 households for cattle and 18 households for small ruminants.

Figure 5 indicates a drastic and sustained reduction (of about 56.4%) of sedentary herds surveyed, regardless of species. Cattle recorded the highest levels of loss (59.6%) probably because of their high sensitivity to the impacts of drought attributable to their diet. They were followed by goats (56.7%) and finally by sheep (53.8%). Though goats are more resistant to drought and fodder deficits, given their capacity to use aerial pastures under such circumstances, they were the first to be sold during food and/or feed crisis periods to meet household needs.

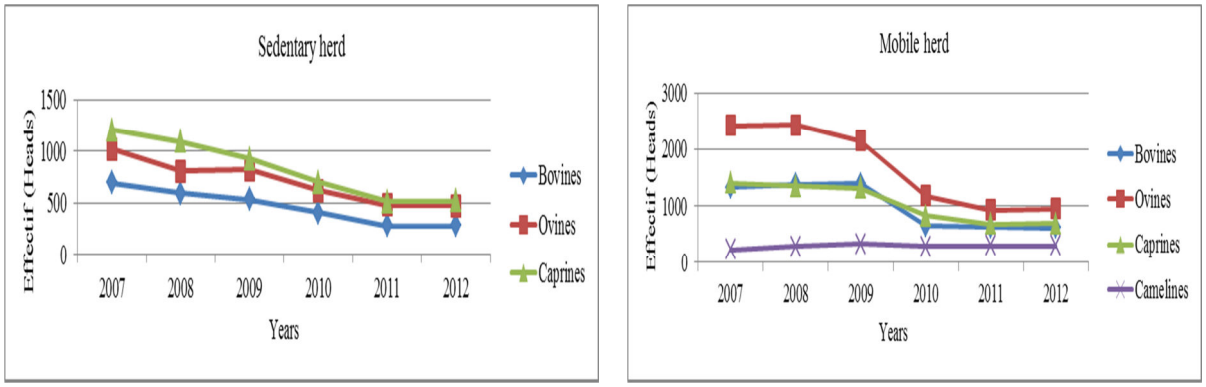

Figure 5. Changes in the numbers of sedentary and mobile herds between 2007 and 2012.

Mobile herds' evolution

For mobile livestock, the number of respondents per relevant species is : 27 for cattle ; 37 for sheep ; 31 for goats and 13 for camels. Figure 33 shows a reduction in livestock of about 52% between 2007 et 2012. Sheep are the most affected species (60.8% loss), as opposed to sedentary herds, followed by cattle (53.6%) and goats (50.5%). Camels, with 27.8% loss, are the least affected animals, probably given their drought resistance capacity and their diet (figure 5). According to pastoralists interviewed, animals were subjected to lengthy walks and at sustained pace to find pastures and best safeguard herds (especially cattle and camels). Animals were thus exhausted, weakened and vulnerable to diseases. Sheep, enable to sustain such a rhythm, thus recorded the highest mortality rates during this feed crisis.

Determinant factors

To account for the increase or reduction of herds, respondents were asked a multiple choice questions and by order of priority questions, as the case may be. Frequencies of key reasons given by respondents are reported in table 1.

Analysis of results per species shows that droughts (or fodder deficits) and animal diseases are the main causes of herd reductions. Indeed, 83% of relevant households estimate that drought ranks among the causes of bovine mortality in their herds. At the same time, 76.6% of such households reported animal disease related mortality as one of the other causes of reduced bovine herds, while 34% report sales as one of the main causes of the reduced number of their cattle.

Table 1. Main reasons put forward to account for reduced herds, according to species

Item	Number of relevant households	Disease-related mortality		Drought-related mortality		Sales to meet household needs	
		Number of responses	%	Number of responses	%	Number of responses	%
Bovines	47	36	76.6	39	83,0	16	34.0
Ovines	35	30	85.7	31	88.6	13	37.1
Caprines	36	31	86.1	30	83.3	14	38.9
Camel**ines**	14	10	71,4	11	78.6	8	57.1

Similarly, droughts and animal diseases were respectively reported by 71.4% and 78.6% of responding households as the main causes of reduced number of camel herds. In addition, 57.1% of households also reported sales as one of the reasons why the number of the dromedaries decreased over the period under consideration. For sheep, 88.6% of household affirm that drought is one of the factors which led to sheep mortality within their herds. In the same vein, 85.7% of households estimate that animal diseases are also involved. Contribution

of sales to reduced number of sheep was reported by only 37.1% of respondent households. For goats, response frequencies are, by order of importance: 86.1% for animal diseases; 83.3% drought-related mortality and 38.9% for sales.
Animal disease and/or drought-related mortality was put forward in 95.8% of cases as the basis for reduced number of cattle; 94.7% of cases for goats and 88.6% of cases for sheep. All households sampled and interviewed in the Region (pastoral depressions, Komadougou and Lake Chad) estimate that drought, which generates chronic fodder deficit; remains the main cause of livestock mortality in the Region and that diseases are in fact the impacts of weal underfed livestock.

Discussion

An evaluation study on the 2009-2010 pastoral crisis revealed loss of about 24% of the livestock of Niger during this crisis (Republic of Niger, 2011). The main causes of animal mortality include: fodder deficit (38%) and diseases (35%). On this basis, it may be said that against our results, the Region of Diffa has been relatively more affected than the national average, on the one hand, and on the other hand, confirmed the occurrence of animal diseases and fodder deficits in the evolution of livestock in the Region.
Thus, between 2010 and 2012, the Regional Directorate of Livestock and anima industries (DREIA, 2010 ; 2011 ; 2012) of Diffa recorded 296 reports of suspected outbreaks of legally contagious diseases with a predominance of suspected piroplasmosis (36 % of reported outbreaks); of sheep pox (31%) and pasteurellosis (20%).

Conclusion

In summary, it seems that livestock in the region of Diffa was affected between 2007 and 2012. Camels and goats, given their diets (capacity to use aerial pastures) were less affected. Droughts, which generate fodder deficits, are the main causes of reduced livestock, both in large and small ruminants. Fodder deficit translates into under-feeding of animals which become very vulnerable to diseases..

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