

Social Perceptions and Representations of Climate Change in Niger Republic: A Social Phenomenon with Multiple and Varied Interpretations

Elhadji Idi Issoufou Adamou

Abstract: *This article analyzes the local perceptions and representations of climate change in the republic of Niger. Commonly, the scholars indicate that anthropogenic activities are the basis of greenhouse gas emissions which favors the triggering of climate change. Though the repetitive climatic hazards degrade the natural resources, increase the vulnerability of the population socio-economic conditions and therefore represent a threat for the survival of the population especially in developing countries. In Niger republic most of the populations are rural and have their own social perceptions and representations about this social phenomenon. The objective of this article is to explore and analyze the local perceptions and social representations in the form of statements of climate change. These perceptions and representations are structured around numerous climate change manifestations such as changes in precipitation, temperature in wind prediction of the quality of the rainy seasons and strong occurrence of floods. This analysis finds its originality in the context of rainfall deficit, degradation of agricultural and pastoral lands as well as other climatic manifestations. An 87% rural and agro-pastoral population naturally present perceptions and representations of a phenomenon that is destructive and disruptive to their survival. These perceptions and representations are analyzed to understand climate change in all its facets.*

Keywords: *Perceptions, Social Representations, Climate Change, Niger Republic, Social Phenomenon.*

I. Introduction*

Climate change is the fundamental problem facing the world today. Thus, African countries, especially those in the Sahelo-Saharan strip, including Niger, are faced with a persistent rainfall deficit combined with the harmful effects of human actions. This climatic situation has seriously affected the major ecological balances of the area, thus leading to the degradation of natural resources, the decline in agricultural, pastoral, forestry and fishery production, all of which keep populations in food insecurity and poverty. The gravity of this situation has consequences on land degradation which is becoming more and more severe for the local populations whose needs are growing and depend on these renewable natural resources. In Niger, the harmful effects of climate change and variability linked in part to the drop in rainfall and demographic pressure, jeopardize the sustainability of the ecological and economic management of certain agro-productive systems. This situation is reflected on the one hand by the extensive degradation of natural resources, the silting up of fertile basins and dwellings, the cereal deficit, the reduction in forest areas and grazing areas, and, on the other hand, by the loss of livestock and able-bodied workers through the rural exodus and the growing impoverishment of vulnerable communities (United Nations Convention to Combat Desertification, 2018).

Niger is therefore one of the most vulnerable countries in the world in the face of climate change, the repercussions of which are enormous and varied. In this Sahelo-Saharan country, almost every year devastating climatic manifestations are observed, this is a phenomenon that has tended to increase in recent decades.

Thus, climatic manifestations constitute complex and worrying events of the present generation. These disturbances caused by climate change, subject to multiple perceptions and representations, are a complex reality that currently leaves entire communities vulnerable in Niger. Very heavy material and human damage are caused every year. According to the documentation available on environmental risks, many factors must be taken into account to explain this state of affairs. In the turn of these recurring climatic phenomena, perceptions and representations are developed at the national level.

This study analyzes the local perceptions and representations of climate change in Niger as well as the different interpretations made to this phenomenon by the local populations. Based on in-depth surveys of resource persons, this research shows that populations perceive climate change through several factors in Niger. The interpretation of these changes results in diverse local perceptions and representations. These perceptions and representations vary according to the localities of the country. The main determinants of the adoption of adaptation strategies are the variables of perceptions and representations.

- **Problem Statement**

Climate change is a multidimensional phenomenon; which social impacts is often analyzed lightly. The results of this study were supposed to theoretically new knowledge provided in the field of social sciences and particularly for sociologists in terms of sociological analysis tools. Climate change is, therefore, a particularly degrading sociological phenomenon, especially in recent years for this community straddling tradition and modernity. Wanting to analyze the perceptions and representations of climate change in this country amounts to explaining the daily lives of a community exposed to multiple and multifaceted climatic hazards. In this study, it was focused on analyzing local social perceptions and representations around the phenomenon of climate change.

- **Literature review**

The Sahel is one of the most vulnerable regions to climatic events. The region is characterized by high variability of climatic parameters, especially precipitation, both in space and in time, the repercussions of which are enormous and varied. Many social scientists have developed factors that explain the manifestations of climate change in this climate zone. Among these factors, we can note the increase in the intensity of natural disasters, desertification and the advancement of sand dunes, the scarcity of drinking water resources, also called water stress, and to a certain extent galloping demographic dynamics.

Indeed, global climate variability is partly linked to how the planetary resources responsible for greenhouse gas emissions are exploited (IPCC, 2007; Gemenne, 2009; Ethemcan, 2016). For De Jouvenel (2008), how the planet's resources are used to fuel the development model weakens the balance of the ecosystem, raising an increasingly worrying question about the sustainability of this development model and the capacity of our planet to meet the needs of humanity. According to the World Bank (2010b), climate change is everywhere in the world, particularly felt in developing countries. These changes are reflected, among other things, in more frequent and severe flooding, extreme weather events, desertification and sea-level rise. These ultimately affect the availability of water, food security, and the livelihoods of millions of vulnerable people around the world.

For Hunter (2001), the physical effects of climate change, in general, can be grouped as follows: First, the increase in global average temperature; changes in precipitation; melting ice (mountain glaciers, snowpack, arctic sea ice); ocean acidification (capture of CO₂ released into the atmosphere); sea and ocean level rise (due to water expansion due to warming and melting ice); the impact of extreme weather events (heatwaves, drought, floods, cyclones, etc.). Borrowing Schwartz's remarks, Delcroix (2008) identifies three main consequences of climate change: droughts, sea-level rise, and storms. It also highlights the effect of the phenomenon on migration. According to Hunter (2001), climate change will first result in an increase in the frequency and intensity of natural disasters which include both hydro-climatic and geophysical disasters.

In Niger, perceptions and representations of climate change remain a very little explored field of research. The perceptions and representations of the Nigerien population on climate change show a downward trend in rainfall throughout the country. This sentiment is shared and is also visible in the northeast and northwest regions. We

also note the increase in the intensity of rainy events. In the regions of the southern strip, signs of rainfall trends are also decreasing but very little felt compared to the northern regions. Consistency between perceptions and recent trends is observed for rainy episodes during the dry season.

A relatively average majority (66%) believe that climate change will have only negative consequences in this country. The others think that it can have negative and positive consequences in this Sahelian country. However, almost all of the people surveyed for this research have more worrying perceptions and representations of climate change every day. 34% say they are even much more worried, especially with the scarcity of rains in recent years and the repeated floods recorded. In this country with an agro-pastoral vocation, young people who represent $\frac{3}{4}$ of the population seem to be much more worried than their elders. Finally, the populations whose concern has grown the most in recent years are those of the peasants.

- **Social perceptions of climate change**

Climate change is a complex phenomenon, both in its understanding and in its interpretation. The climatic factors considered as indicators of climate change in this area are precipitation (amount of rain, number of rainy days, geographical distribution of rain), maximum and minimum temperatures, winds, droughts, floods, etc.

- ❖ **Social perceptions of changes in precipitation**

The Nigerien population has been facing high climate variability for decades. Niger is country whose main population activities are agriculture and animal husbandry. Indeed, agriculture and livestock are the main engines of the country's economy. However, the implementation of agricultural and pastoral activities depends on rain, which is the primary climatic factor. Therefore, climatic conditions determine the practical conditions for agriculture and animal husbandry. This is why the Nigerien population maintains strong links with its environment. The Nigerian people in general have an excellent knowledge of the climate, its manifestations, and the various changes that have occurred in recent years.

"The amount of rainfall and the quality of the season determine the socio-economic conditions of the population. All of us obtains our living conditions from agriculture or animal husbandry, and both activities rely heavily on rain. This strong link between us and the environment means that the population in general and especially the elders have an excellent knowledge of the cycle of precipitation and other climatic indications. It is a science handed down from father to son so that from generation to generation. However, this wealth tends to disappear from year to year, young people attach little importance to their ancestral practices" (I.M, farmer).

There are many names associated with climate in general and rain in particular. These names refer to the different manifestations of changes in precipitation, each of which determines a particular time of the season. These proper names which designate the various rainy manifestations are among others: decrease in rains, delay of rains, irregularity of rains, early cessation of rains, heavy rains.

- **Social perceptions of drop of the precipitation**

Climate change has been a reality for several decades, affecting various climate variables, including precipitation. The decrease in rainfall has become one of the biggest problems facing the people of Niger, especially the farmers and herders. The decrease in rains also has major socio-economic consequences for the population. Food insecurity due to reduced rains has had enormous consequences, including the displacement of the population. This displacement is towards the humid zones of the south and the big cities, creating conditions of social instability which one still observes today in all the country. Thus, all the people questioned affirm that the rainy season is getting shorter. It used to be 3 to 4 months, the rainy season is now only 2 months or even 45 days.

"Every year, the decrease in rainfall deteriorates the quality and quantity of agricultural production in Niger. Farmers have to sow several times because the seedlings perish before the start of the rainy season. Often people witness the sudden and unexpected end of the rains" (M.S, expert in climate change at the Ministry of Agriculture).

Farmers are forced to abandon local varieties in favor of imported varieties. However, according to local opinion, the quality and taste of food, that is imported varieties, remains depressing.

According to all interviewees, precipitation volumes have decreased over the past thirty (30) years compared to the previous thirty years. For those questioned, the decrease in precipitation can be observed over the years, especially in real periods of heavy rains. Survey participants as a whole claimed that the number of rainy days has decreased over the past three decades compared to the previous thirty years. The rains intensify for a very short time, so crops do not take full advantage of the amount of water that falls during the rainy season. This situation also puts herders under pressure to migrate to areas more suited to pastoral activities.

- Social perceptions of the postponement and early cessation of rains

As in all Sahelian countries, the delay in the beginning of the rainy season and the early end of the rains in Niger republic constitute an obvious reality of climatic change. This delay, and the early end of the rains, have several consequences such as a gradual deterioration in the quality of pastures. This forces pastoralists to seek suitable pastoral areas. Also, it is noted that the degradation of agricultural land pushes the farmers to seek arable land.

Faced with the delay in the start of the rainy season as well as the early cessation of the rains, certain growing anxiety arises each year in the minds of the population particularly the farmers and herders.

"These concerns, while legitimate, should be alleviated. The rainy season does not start at the same time across the country. The start and end dates of the rainy season are expected to change as the rainfall variables change each year due to effects of climate change" (A. M, Technician and Environmentalist).

Everyone interviewed for this research asserts that there is a great rhythmic change during the rainy season. The rains currently start between June and July and end in early September. Thirty years ago, the rains would certainly start in March, or at most in April, and end in October or even in November. This rapid change in rainfall seasons reflects the non-functionality of the traditional agricultural calendar in Niger.

- Social perception of irregular rainfall

In Niger Republic, climate change is felt more and more through the irregularity of the rains each year. This rainfall irregularity has disastrous consequences for the population. Rural communities, which are the groups most at risk, are often the hardest hit.

"When the rains are weak, farmers, herders, and the rural population are the first victims. But in reality, the entire population is directly or indirectly affected by the irregularity of the rains. All the basic elements of the living conditions of the population are becoming expensive and scarce. This scarcity of products is a major problem that affects the population, subject to rising food prices. Animals lose weight and this affects the quality of the meat. The rains are irregular but can fall abundantly and often cause serious flooding " (A.A, Researcher specializing in climate change).

All the participants to the interview participants affirmed that the rains have been very erratic in recent years. The elder participants still have memories of regular rains and speak of this moment with nostalgia and have anxiety for years to come.

- Social perception of heavy rainfall

Niger Republic is a theatrical region where almost all climatic change signs are observed. However, climatic paradoxes continue to confuse Nigeriens population in recent years. For several decades, there has been a decrease in the length of the rainy seasons, but an increase in precipitation over a short period. The rains fall more and a shorter period. The timing of precipitation has changed dramatically in recent years. Almost all of the players are wondering what to do and what not to do. The recent floods are due to heavy rains which took everyone by surprise. Indeed, even if precipitation decreases on average, there is an increase in its intensity. Thus, the rains come in the form of extreme events, even more, and more catastrophic.

In Niger, hundreds of thousands of people have been forced to leave their homes in recent years, mainly due to flooding. The floods caused loss of life and extensive material damage.

“Climatic protests have taken their toll in Niger in recent years. The 2020 floods officially killed 45 people and affected 226,563. In addition, 20,201 homes and 64 classrooms collapsed. Additionally, about 44,295 animals and 5,306 cropping hectares were affected by the floods” (B.M, Agent local NGO).

All those questioned agree with the phenomenon of heavy rains observed in recent years. They say they are aware that these extreme events are clear signs of climate change. According to survey data, respondents say they noticed some “change or deterioration” during the rainy events compared to what they experienced in the past (thirty years ago). It should also be noted that the information obtained in all regions of Niger Republic is almost similar from one region to another.

❖ **Social perceptions of thermal and solar changes**

Niger is one of the hottest countries in the world. The Nigerien population was aware of the effects of their thermal changes. People have noticed an increase in the intensity as well as the duration of heat. In March, April, and May, the temperature in the shade can reach 45 degrees. To express the extreme heat intensity, the statement of one of the interviewees is quite explicit:

"The heat which manifests itself between March and May is inexplicable and insupportable. The air becomes heavy and hot, making the environments uninhabitable. The heat felt under the trees and in the rooms, day and night are excessive and even dangerous. During these times, people are forced to spend nights under the stars. People are exposed to various diseases. This heat is the direct consequence of climate change " (S.A Technician at the Ministry of the Environment).

❖ **Social perceptions of wind changes**

Niger Republic is a country with increased winds. Social perceptions of the wind regime change with the season. The wind is one of the climatic factors whose memories are often painful. The manifestations of the wind after the rain cause great damage to crops, pastures, and the habitat of the population, in particular their homes. People who took part in the interview claim to have noticed that the wind is showing more and more in recent years. Indeed, most of those interviewed confirmed that there are increasingly strong, destructive, and insectivorous winds. Several periods of recorded strong and destructive wind manifestations are mentioned.

- **At the beginning of the rainy season**

The beginning of the rainy season is marked by very strong wind movements. These very strong winds blow after the first fruitless rains of the season. These winds remain in a common memory because of their very strong character, causing great damage to homes and vegetation, especially trees.

During the rainy season, the winds are less strong than before the rainy season (that is early rainy season winds), but they are also harmful to crops and pastures.

- **At the end of the rainy season**

The end of the rainy season is also marked by winds. Except for strong winds, the other wind manifestations observed at this time of year remain the same for the populations, with some variations in their occurrence and duration.

❖ **Forecast of the rainy season in the local Nigerien environment**

The Nigerien population, especially the local population, has always had social representation or an ability to forecast the weather in the short or relatively long term. Indeed, this population has local knowledge of weather forecasts. In the context of these meteorological forecasts, populations are particularly inspired by observations of animals, plants, and often even of the mystical world. These weather forecasts are made by observing the movements of certain celestial bodies such as the moon, the sun, the phenology of certain plants, and the ethology of certain animals. To this are added physical or chemical modifications of the atmosphere (one can note here the color of the sky, the direction of the wind, etc.), as well as symbolic and often mystical systems.

"Certain categories of people, especially the elders, have this traditional knowledge. My grandfather predicts the climatic indications through signs which appear during the day or at night. He is very good at it and is seldom wrong, confirmed to us the old peasant" (L. A, Farmer).

Nigerien populations, especially the local ones, devote themselves to forming a technical committee in the various villages each year to identify the warning signs of the rainy season so that the populations can take appropriate measures.

- **Thunders throughout the rainy season:**

According to popular public opinion in Niger, the persistence of thunders throughout the rainy season means that the regularity of the rains is uncertain and an abrupt stop can occur at any time during the rainy season.

- **The frequency of rainbow appearances at the beginning of the rainy season:**

In the imagination of the Nigerien population, the frequency of appearance of rainbow confirms an uncertain nature of the rains and that the rainbow is a genius or an old demon that appears in this form to disrupt potential rains. This generation-wide belief continues to exist despite all the explanations and technological advances recorded in recent years.

- **Greening of trees (give new leaves)**

Depending on local social perceptions and representations, the greening of trees has several meanings. Indeed, when the trees start to green from below, it announces a good rainy season. On the other hand, according to the people questioned, the greening of the trees from the top announces a bad rainy season.

- **Position of ant nests (insects)**

According to social representations in Niger, the positioning of anthills at the approach of the winter season makes it possible to predict the quality of the rainy season. Indeed, if the anthills occupy the places where water passes during the rainy season, it is a sign that the rainy season will be bad. On the other hand, if the anthills still go up the slopes (climbs), it means that this season will be good. People follow the movements of these insects to predict or get an idea of what the next rainy season will be like.

- **Wind direction during the rainy season**

Wind direction is an important indicator in determining the quality of the rainy season in Niger. Wind direction is a signal by which the population can predict the quality of the rainy season. It is also a bad sign when the wind blows from south to north. This means that the harvests will not be good this year. But when the wind blows from west to east, the rain will be plentiful and the rainy season will be good in every way.

- **Wind speed**

According to local Nigerien perceptions, the wind speed during the first rains is a sign of the quality of the rainy season. If the wind blows regularly after the first rains, it is a harbinger of a beneficial rainy season for the population.

- **The sight of the mists**

According to local perceptions, the appearance of fog at a certain time of the day at the beginning of the rainy season is a significant message. Indeed, as the rainy season approaches, the appearance of fog in the early morning or at dusk is the harbinger of a good rainy season.

- **The appearance of the stars**

According to local representations, the appearance of stars can have several meanings. Indeed, the appearance of stars in the west at dusk is the sign of a good rainy season.

- **Hail at the first rain**

According to local perceptions, hailstorms are an important determinant of the rainy season. Indeed, when the first rains fall with hail, it is a harbinger of a good rainy season.

In short, these different observations represent popular perceptions in almost all regions of Niger. These indicators provide a basis for predicting the quality of the rainy season (good or bad). Farmers and pastoralists use these observations to make decisions about the organization and conduct of their activities. In Niger, these social perceptions are passed on from generation to generation. Likewise, these popular observations have proven effective for decades.

❖ **Floods**

The new climate regime in Niger has serious consequences, especially for the population. The frequency of flooding is increasing every year in all regions of the country. Flood recordings have followed one another in the Niger River in Niamey for nearly fifteen years. According to Thierry Lebel et al (2018), these deadly floods over the past decade are attributed to the combined effect of increased rainfall due to climate change and land-use changes. Galloping demography, deforestation, reduction of fallows and rapid urbanization combine to reduce the water absorption capacity of soils, especially in the Sahel region.

Those interviewed as a whole say that flooding has seen an increasing trend in recent years. The floods are repeated and cause many deaths and significant material damage. For this reason, the interviewees always evoke the intensification of precipitation, in particular the change of climatic regime. Finally, these respondents also report population growth in urban areas, sometimes accompanied by the anarchic occupation of land.

"Everything fell, even the walls and the trees are facing the worst floods in our history and all because of the consequences of climate change, the destruction of savannas, and the flooding of the Niger River. Everything changed, we never imagined such a spectacle, and especially here in the capital of the country, which experiences extreme serious natural disaster " (A.K, *Flooded Citizen*).

❖ **Consistency between perceptions and scientific data on the manifestations of climate change in Niger**

Climate change is a complex phenomenon and today constitutes one of the important dailies of the West African population in general and of Niger in particular. However, to explain the manifestations of climate change in this area, the social perceptions of the population are not sufficient, they must be correlated with analyzes of scientific data.

Indeed, given all the results concerning social perceptions of climate change, it can be said that local populations are indeed observing a constant change in their environment. They also noticed a change in the manifestations of rain, temperature, sunstroke, and wind movement, resulting in a change in the climate as a whole. However, despite the level of understanding, beliefs, and very clear explanations of populations on climate change, their perception of the phenomenon alone is not sufficient to conclude that there is climate change.

"Of course, in our societies, local knowledge is passed on from generation to generation and social structures play an important role, but the climate phenomenon is very complex. To understand them, it is necessary to combine all types of knowledge, especially scientific explanations " (K. T, *Municipal Councilor*).

It is, therefore, more than necessary to add a scientific approach to social perceptions based on the analysis of statistical data so that these social perceptions are confronted with trends revealed at the scientific level.

II. Method

This study used qualitative research method. Accordingly, qualitative information about the perceptions and social representations of Nigerien populations about climate change and its socio-economic and environmental impacts were obtained from sociological analysis approach through long and informative interviews. Also, other literature sources such as official reports and document were analyzed for a better understanding of the study aspects. In fact, the complexity of the effects of climate change and its associated social perceptions makes it compulsory to use a qualitative approach for a better analysis of the opinions of the interviewees. In this perspective, social perceptions and representations analysis of climate change was conducted.

III. Data Analysis

As part of this study, the analysis of the data collected was made based on a specified scheme. The data analysis process is based on recording using a digital voice recorder and noting during the interviews. The advanced points of view by interview participants were written down progressively and were subjected to content analysis after being proofread several times. This technique, developed as part of qualitative research, allows not only to analyze but also to code the interviews and the answers provided. This method makes also it possible to measure the responses and avoids overestimating the points of view expressed by a minority of respondents and so without impact. In addition, this technique facilitates the appearance of hidden information and makes visible all the different aspects to be described. In order to carry out a clear and comprehensible analysis, the information are coded in the form of words and groups of words.

The last step consists in grouping the information in unit of analysis, and categories. Finally, the relevant research data were reported and interpreted according to codes and groups of codes. In this perspective, direct quotes from data collected from interviewees are reported to make the analysis more understandable. The data collected was coded, entered, and processed with the RQDA software. The variables of perceptions and social representations of change indicators are dichotomous. The frequency analysis was done by considering in particular the percentage proportions. The rates of perceptions and social representations considered are the average values of the results obtained.

IV. Findings

The overwhelming majority of those interviewed remember, depending on their age, the droughts of the 1970s, 1980s, 1990, 2005, 2011, and recently in 2020, which are important climatic events, which shape perceptions and representations of climate change., since the increase in these extreme weather events, most of the people questioned to share the same opinions on the amount of rain. The amount of rains has sharply decreased over the past 30 years.

Although the quantity and the average quantity of annual precipitations are still lower compared to previous years, the Nigeriens in their absolute majority depend on the rains for the practice of their principal activities (agriculture and breeding). This dependence of the population on the rainfall regime pushes them further into degrading socio-economic and environmental situations. Breeders speak nostalgically about the quality and quantity of the grasses their animals graze on. At the same time farmers also report declining crop yields, these may explain the lower perceived quality and quantity of rainfall and thus affect perceptions and representations of climate change.

This constantly decreasing rain is also poorly distributed in space and time according to the opinion of all the interviewees. This poor distribution of precipitation, more felt in the north-eastern and north-western regions, also leads to an unfavorable socio-economic situation in this large part of the territory.

Apart from this decrease in space and time, the rains are irregular in Niger. Climate change and its impacts have disrupted the winter calendar which once spanned a long period and the rains were also regular.

In the comments of the interviewees, he also frequently returns to their perceptions and representations of climate change, the permanent and continuous advance of desertification, and the reduction in the diversity of vegetation. While regreening as well as degradation trends occur in part mainly due to human activities and practices, biodiversity and the diversity of tree species, in particular, have declined dramatically.

Climatic and environmental conditions are particularly important for the entire Nigerien population, as 87% of families depend on agriculture and animal husbandry as their main activity, source of income, and food supply. These two activities are also the main economic activities at the individual level (Zakary RHISSA, 2010).

The interviewees also speak fluently about crop pests. The majority of those interviewed attribute the spread of these crop pests to climate change. They also report a critical lack of quality seeds adaptable to the rainfall regime. The Nigerien agricultural calendar has gone from 3 to 4 months of rains to almost two months or even 45 days. At this level, it should be noted that the interviewees say that they have resorted to seeds imported from all over the world even if, moreover, this is not without consequences.

In addition, opinions on declining soil fertility due to overexploitation of soils and also general land scarcity due to population growth were named. Indeed, Niger is the country with the highest birth rate in the world (3.9) with a total fertility rate of 7.1 children per woman of reproductive age (United Nations, 2019). This situation favors the rapid increase in climate change and generates multiple and multifaceted socio-economic consequences. This rampant increase in population creates a greater need for food and other natural resources, the continued exploitation of which further exacerbates the environmental imbalance.

It should also be noted that among the parameters and indicators (signs) of climate change, temperature and wind have been cited as being the most decisive changing climatic parameters in recent years. These perceptions and representations shared by the populations can be explained by the fact that these climatic variables have a direct influence on agricultural and pastoral production and habitats. These major climatic factors determine the quality of the winter season.

Perceptions and representations are also developed around the increase in temperature and winds depending on the locality. Indeed, the increase in temperature causes bush fires, which in recent years has been a major concern of the entire population. The latter also facilitates the burning of crops and creates an atmosphere unfavorable to the development of crops. It is also at the base of certain series of the food crisis and the insufficiency of feed for cattle.

People also believe that they have witnessed in recent years an increase in the frequency and intensity of winds that are causing erosion of agricultural land, lodging of crops, the advance of the desert, and uprooting of trees. This situation has favored the loss of the number of houses in straw huts which constitute the main habitats of the population, especially in rural areas.

Conclusion

In conclusion, climate's perceptions and representations have multiple facets. Nigerien populations perceived climate change by a means of numerous factors such as reduction of the rainfall, rainfall irregularity, abrupt cessation of the rainfall, the increase of the temperature, occurrence of violent winds, repetitive floods and progression of the desert. These climatic hazards impacted severely the environment and pose serious threats on the living conditions of the population.

Indeed, Niger is one of the countries where the main activities of the population include agriculture and livestock that strongly rely on the rainfall. Given that around 87% of the country's population is engaged in rain-fed agriculture and animal husbandry the understanding of the population perceptions and representations grounded on climate change is easier. The occurrence of the extreme weather events such as drought, high temperatures, floods, winds, and erratic rains are the most manifestations of climate change that attract the attention of most of the population who often interpret them irrationally compared them to other rational ones.

This study showed that the cultural and socioeconomic characteristics of households influence the population perceptions and representations of climate change. Also, it revealed that the population perceptions and representations of climate change determine their developed strategies to respond to the adverse impacts of the climate change. Accordingly, the population strongly relied on some beliefs such as developed over the years about the phenomenon of climate change. There is an urgent need to raise the population awareness, strengthen their knowledge and capacities through climate change training to help them to apprehend its numerous impacts. These could improve their perceptions and representations of this phenomenon and help them to develop their own adaptation strategies to cope with the negative impact of the phenomena.

References

- [1.] Bambara², A. Bilgo², E. Hien², D. Masse³, A. Thiombiano⁴ et V. Hien². (2013). Perceptions paysannes des changements climatiques et leurs conséquences socio environnementales à Tougou et Donsin, climats sahélier et sahélosoudanien du Burkina Faso D.
- [2.] Banque Mondiale. (2010b). Rapport sur le développement dans le monde Développement et changement climatique.
- [3.] Convention des Nations Unies sur la Lutte Contre la Désertification. (2018). Processus de Définition des Cibles de neutralité en Matière de Dégradation des Terres: Rapport Final du Programme de Définition des Cibles de NDT
- [4.] De Jouvenel, H. (2008). « La bombe climatique » in *futuribles, analyse et prospective*, no 341.
- [5.] Delcroix, G. (2008a). « Changement climatique : enjeux géostratégiques. Un panorama critique. Des exercices de prospective récents », in *futuribles, analyse et prospective*, no 341.
- [6.] Delcroix, G. (2008b). « Changement climatique : risque géopolitique ? », in *futuribles, analyse et prospective*, no 341.
- [7.] Ethemcan, T. (2016). Kim giden, kim kalan? COP21 sonrası iklim değişikliği ve göç.
- [8.] Gemenne, F. (2009). *Géopolitiques du changement climatique*, Paris, Armand Colin.
- [9.] GIEC. (2007). Bilan 2007 des changements climatiques. Contribution des Groupes de travail I, II et III au quatrième Rapport d'évaluation du Groupe d'experts intergouvernemental sur l'évolution du climat [Équipe de rédaction principale, PACHAURI, R.K. et REISINGER, A. (publié sous la direction de)]. GIEC, Genève, Suisse.
- [10.] Hunter, L. M. (2000). *The Environmental Implications of Population Dynamics*. Santa Monica, CA : RAND Corporation.
- [11.] Hunter, L. M. (2001). *Population et Environnement : Un Rapport Complexe*. Santa Monica, CA : RAND Corporation.
- [12.] Mathieu Ouédraogo. (2010). Perceptions et stratégies d'adaptation aux changements des précipitations : cas des paysans du Burkina Faso.
- [13.] United Nation. (2019). [Department of Economic and Social Affairs Population Dynamics, World Population Prospects 2019](#).
- [14.] Zakary, R. (2010). Ministère de l'Élevage, des Pêches et des Industries Animales. Revue du secteur de élevage au Niger.