

# Evaluation of gender vulnerability to climate change in N'Djamena, Chad

Technical report

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Global Center on Adaptation:  
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Groupe Huit

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### ABOUT THE GLOBAL CENTER ON ADAPTATION

The Global Center on Adaptation (GCA) is an international organization, hosted by the Netherlands, which works as a solutions broker to accelerate action and support for adaptation solutions from the international to the local, in partnership with the public and private sector, to ensure we learn from each other and work together for a climate resilient future.

## Consultants:





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# 1 Abbreviations

Acronyms	Definitions
<b>CDN</b>	Nationally Determined Contribution
<b>Cc</b>	Climate change
<b>CEDAW/CEDAW</b>	Committee on the Elimination of Discrimination against Women
<b>ECCAS</b>	Economic Community of Central African States
<b>CELIAF</b>	Liaison and Information Unit of Women's Associations
<b>CPDCRA9</b>	Standing Committee for Development and Resilience Against Hazards in the 9th Arrondissement
<b>EDS-MICS</b>	Demographic and Health Survey with Multiple Indicators
<b>FAO</b>	Food and Agriculture Organization
<b>IFAD</b>	International Fund for Agricultural Development
<b>Gca</b>	Global Center on Adaptation
<b>Gds</b>	Gestion of Déchets Solides
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>UNHCR</b>	High Commissioner for Refugees
<b>IDG</b>	Gender Development Index
<b>IGI</b>	Gender Inequality Index
<b>IPCC</b>	English IPCC
<b>MFFPE</b>	Ministry of Women, Family and Child Protection
<b>MEPDCI</b>	Ministry of Economy, Development Planning and International Cooperation
<b>MID</b>	Ministry of Infrastructure and Opening Up
<b>MAFDHU</b>	Ministry of Land Affairs, Housing Development and Urban Planning
<b>FGM</b>	Female Genital Mutilation
<b>Msf</b>	Médecins Sans Frontières
<b>OCHA</b>	UN Office for the Coordination of Humanitarian Affairs
<b>Odd</b>	Sustainable Development Goals
<b>Iom</b>	International Organization for Migrants
<b>WHO</b>	World Health Organization
<b>ONASA</b>	National Food Safety Office
<b>NGO</b>	Non-governmental organization
<b>OXFAM</b>	Global movement of people working together to fight against the inequalities and injustice of poverty
<b>PAM</b>	World Food Programme
<b>Aap</b>	African Action Plan
<b>PA-PNG</b>	Action plan for its implementation of the gender policy 2019-2023
<b>PNDS</b>	National Health Development Plan 2018-2021
<b>Pure</b>	Reference Urban Plan
<b>SNFIT</b>	National Strategy for Inclusive Finance in Chad 2017-2030

<b>SNE</b>	Public Health Service Manager
<b>SOPROFIM</b>	Land and Real Estate Development Company
<b>Tdr</b>	Terms of Reference
<b>UNICEF</b>	United Nations Children's Fund
<b>UNITAR</b>	United Nations Institute for Training and Research
<b>USAID</b>	United States Agency for International Development
<b>GBV</b>	Gender-Based Violence
<b>WASH</b>	Water, sanitation and hygiene

## 2 EXECUTIVE SUMMARY

This document is the final report for the "N'Djamena (Tchad) Gender Vulnerability Assessment - Climate Change". This report presents the main findings of a qualitative assessment of gender-related vulnerabilities in N'djamena conducted through a literature review and a series of interviews, focus groups and field workshops. It presents the main gaps and vulnerabilities of gender regarding climate change and its impacts as well as the measures identified through the study to address these gaps and vulnerabilities.

This report aims to contribute to the preparation and implementation of a new urban resilience project funded by the World Bank. This gender vulnerability assessment has been commissioned by the Global Center on Adaptation (GCA) in pursuit of its goal of accelerating adaptation to climate change. The objective of the study is to (i) assess vulnerability to climate change from a gender perspective, (ii) identify actions that can contribute to closing the gaps between these differential vulnerabilities and (iii) establish indicators on these activities that allow measuring the degree of contribution of the activity to closing the gaps.

The Global Center on Adaptation (GCA) is an international organization that works as a solutions broker to catalyse action and support for adaptation solutions for a climate resilient future. The City Adaptation Accelerator (CAA) is an initiative managed under the GCA Water-Urban Program. The development objective of the City Adaptation Accelerator (CAA) is to support cities and countries in strengthening their urban climate adaptation and resilience outcomes through enhanced (1) understanding, (2) planning, (3) investments and (4) governance and capacity building. The CAA flexibly deploys a suite of decision-support tools as well as technical and financial advisory services enabling cities to address climate-related urban challenges identified as the biggest impediments to long-term development.

This study is part of the decision-support tools that the GCA provides to local or national government projects funded by development agencies, such as the World Bank, that aim to accelerate and increase the impact of climate change adaptation.

This city-level gender vulnerability assessment is an input for the World Bank's urban resilience project to take into account gender-related vulnerabilities and integrate cross-cutting actions that contribute to reducing these gaps, catalysing the adaptive capacity of the population of N'Djamena. The study identifies and assesses the main factors of gender-related vulnerability to climate risks, particularly regarding flooding.

Given its geographical location, its climate, its topographic and hydrographic specificities, N'Djamena is a city particularly affected by fluvial and pluvial flooding. The city is located 100km from Lake Chad, at the confluence of the Chari and Lagone rivers on an alluvial plain where the soil, made up mainly of clay, silt and sand, has a low absorption capacity. N'Djamena rises at 293-298 metres above sea level, lower than the Chari waters (297 metres) that gently slope northwards to the city. This particular topography causes massive flooding during rainfalls, which normally occur between May-June and September-October.<sup>1</sup>

Concerning the city's climate, N'Djamena is affected by an important rainy season with a monsoon phenomenon (African Moonsoon) that extends over the months of July, August and September. At this time of year, extreme weather events are frequent and show significant inter-decadal variability. Due to the local geology, geomorphology and the above-mentioned hydrological regime, pluvial flooding can start to affect the city at the beginning of the rainy season. As river levels rise, a period of combined fluvial and pluvial flood risk usually follows, with the risk only decreasing as river levels fall as the dry season approaches.

Global warming has been felt since the 1970s and 1980s in the Sahel region with a period of severe drought that has significantly affected water resources, including Lake Chad, which by 1980 had declined by 90%. Since the 1990s, there has been an increase in rainfall in the region with a peak in water volume reached in 2013 in Lake Chad. Lake Chad is a strong example of the climate variability affecting the N'Djamena region in relation to climate change. Even if it is difficult to predict climate

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<sup>1</sup> Ishmael Maazaz, "Hydraulic bricolages: coexisting water supply and access regimes in N'Djamena, Chad", *EchoGeo* [Online], 57 | 2021, Online since 01 December 2021, connection on 10 August 2022. URL: <http://journals.openedition.org/echogeo/22514>; DOI: <https://doi.org/10.4000/echogeo.22514>

accurately, it is clear that rising temperatures, unpredictable weather events, increased extreme events and rainfall variability will affect people and their living conditions with more floods and intense droughts.<sup>2</sup>

To conduct this gender vulnerability assessment, we first conducted a gender survey to identify all the gaps between women and men and then analyzed (i) how climate change had a specific impact on women (sensitivity) and (ii) how gender inequalities impacted women's ability to adapt.

The identification of these gaps, as well as the opportunities identified during the surveys regarding women's adaptive capacity, allowed us to identify certain actions to be implemented within the framework of the World Bank project and the associated indicators that measure the level of reduction of these gaps.

To do so, we determined categories inspired by the IPCC analysis framework that enabled us to understand the vulnerability of women in N'Djamena, and more specifically to the risk of flooding.

Human capital	Literacy, education, life skills, access to information, health status and nutrition.
Production	This category refers to income, time use, the division of time between productive and domestic tasks and care tasks. . <sup>3</sup>
Resources	This dimension relates to ownership, access and decision-making power over productive resources such as land, livestock, agricultural equipment, consumer durables and credit and to livelihood diversification
Decision making and participation	This dimension concerns leadership in the community, measured here by membership of economic or social groups and public speaking.
GBV and public spaces	This category refers to the design of urban spaces and the place of women in the city and the circumstances that influence their safety.

This framework has allowed us to investigate the social situation and provide insights into the status, roles and responsibilities of women and men and gender gaps. The data provided permitted us to identify gender gaps and vulnerabilities that could be magnified in the face of climate hazards.

As summarized in the table below, the study highlighted the specific vulnerabilities to climate risks of women in N'Djamena, as they are mainly responsible for natural resource-related activities (childcare, agriculture), access to which is limited during extreme events (floods, heat waves) and are generally under constant pressure due to rising temperatures. In addition, they do not have the same means of adaptation due to their lower level of formal and non-formal education, have little say in community decisions (or spaces) and are more likely to be the targets of gender-based violence.

<sup>2</sup> Pham-Duc, B., Sylvestre, F., Fortune, F., Bouchez, C., Créteau, J.F (2020). « The lake Chad hydrology under current climate change." Scientific Reports **10**

<sup>3</sup> Women's contributions to their families, communities and societies are often not part of the formal economy and do not reflect monetary value. This type of work, generally described as 'care work', includes the care of community members, natural property or future generations. Genanet (2013).

Actions		Indicators	Gender-differential vulnerabilities
Adapting by reducing family burdens for women and girls: Facilitate access to water to fuels and energy	Solutions to protect access to water during floods (Water reserve at height).	→ Number and % of women who have improved access to water (time/transport) for human consumption, % women/ female-headed households → Number and % of women who have improved access to water (time/transport) for production; % female heads of household; % women/ female-headed households	<b>Production &amp; Resources</b>  Increased workloads and burden (productive, household, childcare) and Lack of access to natural resources and primary needs (water, energy, food...)
	Renaturalization of watercourses, development of riverbanks and creation of green corridors with fast timber-producing plant species for the sustainable management of wooded heritage, managed by women's cooperatives or women's enterprises.	→ Number of communities and % of women in those communities that benefit from sustainable watershed management.	
Adapting by creating income generating opportunities promoting new entrepreneurial, agroecological and agroforestry practices (women and youth)	Support the training, development of women's sustainable skills and technical capacities in market gardening and other agricultural production (market gardening, water use, natural amendment), forest maintenance (soft cuts, grafts, etc.).	→ Number of beneficiaries of training or capacity building activities, disaggregated by gender and age group.	<b>Production &amp; Resources</b>  Dependency on the agricultural sector Loss of financial resources Loss of assets under their responsibilities (housing, administrative papers...)
	Support the establishment of gender-based training programs for the skills development of SMEs. <sup>4</sup>		
	Support the implementation of training programs on appropriate recycling tools and techniques and on entrepreneurial skills in the plastic waste recycling value chain, as well as in the maintenance of latrines and green spaces (usual defecation zones);		
	Promote the exchange of practices between women and the recognition of technical successes (field schools, exchange of commercial practices, etc.)	→ Number of women's exchange meetings.	
	Support the implementation of income-generating activities for women based on the study of green value chains. e.g., nurseries and seed banks.	→ Number and % of women with increased economic resilience; including number and % of women/ female-headed households <sup>5</sup>	

<sup>4</sup> Small and medium-sized enterprises (SMEs).

<sup>5</sup> The ability to recover quickly from a shock; The ability to withstand a shock; and the ability to avoid the shock altogether.

	Support the creation of micro-enterprises for the manufacture of waterproof bags, pouches and cans that are highly resistant to flooding.		
	Facilitate and promote access to green jobs in the various components of the WB project which is expected to generate a significant number of local labor-intensive jobs	→ Number of women among the employees hired on the operations of the project (of which at least 50% of those employed must be women and 30% young people), broken down according to the nature of the position and the hierarchical levels.	
	Organize manual collection campaigns, collection and transfer of garbage to transfer centers, through local associations supporting the employment of women and youth. (7 CELIAF's member associations work on environmental issues)	→ Number of waste collection campaigns. → Number of local women's associations linked to waste collection, transfer and treatment campaigns. → Number and % of women and men who participated in waste collection campaigns.	
Adapting by promoting access to information, participation and decision-making establishing an early warning system	Dissemination of weather information and early warning for women (translated into traditional tribal dialects) through: - The radio programming of the women's house- The 3000 CELIAF member associations of a culture of climate resilience	→ Number of radio broadcasts, banners or written communications related to weather and climate risks. → Study of how women access and interpret early warning messages and lessons learned integrated into message formats and dissemination processes.	<b>Human Capital &amp; Decision-making and participation</b> Limit understanding and low access to weather information and early warning messages Limited access to community spaces

This table presents a summary of the main differential gender vulnerabilities specific to Ndjamena that are likely to be addressed in the urban resilience project funded by the World Bank. These vulnerabilities are associated with the different categories defined for the analysis of vulnerability determinants (Human Capital, Production, Resources, Decision-making power and participation, and Gender-based violence). Three adaptation activities are proposed in different measures to be taken in order to contribute to the closing of these vulnerability gaps specific to women and girls. In addition, each activity has suggested indicators to measure the degree of contribution to closing the gaps.

The three proposed activities aim to reduce women's vulnerability to floods and high temperatures in the city, particularly in the neighborhoods most affected by these weather phenomena. The activities were designed as adaptation measures, based on the existing adaptive capacities of women and the possibilities offered by the urban resilience project funded by the World Bank.

These adaptation measures aim to reduce vulnerabilities which affect women by strengthening their resilience while addressing the inherent issues of development. These actions of adjustment will reduce the impacts of climate change while creating new opportunities for women and for the overall population. Our aim is to promote long-term, incremental adaptation measures that make women more resistant to shocks and stresses they may face.

The proposed activities are not aimed at closing the gaps of all identified gender vulnerabilities. Vulnerability is a dynamic concept. Vulnerabilities can evolve over time, be cumulative and interact with each other. Given that each vulnerability is multidimensional, it is expected that the proposed actions will contribute to the direct closing of one gap and indirectly impact other adaptive capacities and sensitivities (vulnerability).

For example, in the analysis of the gender-based violence factor as a determinant of vulnerability, a correlation was established between the loss of livelihoods as a result of climate events, the stress caused by this uncertain situation and domestic violence. The proposed activity of creating income-generating opportunities is aimed at redressing the disproportionate impact on women's livelihood activities following a climate shock. However, by providing an increase in economic resilience, there are fewer sources of stress during and after disasters contributing to a decrease in domestic violence.

Gender-based violence is also linked to extreme weather events and their impacts on Ndjamena's urban environment. Higher rates of robbery and violence against women on the streets are the result of an unhealthy and dangerous environment.

Another example of the cascading effect that reducing a gap in women's vulnerability can have is the generation of income through activities that improve the urban sanitation environment. Income generation seeks above all to respond to immediate needs and contribute to reducing the increased economic burden on women generated by the impact of climate change. Women in N'Djamena, as in other developing countries, play a significant role in food security, household income and productive work. Income-generating activities thus seek to respond to this particular vulnerability based on the distribution of labour between genders. But the same activities can have positive impacts on other vulnerabilities. Unhealthy urban spaces increase the risk of morbidity due to deteriorating public hygiene, mainly affecting pregnant women and children. Maternal and reproductive health is a major challenge for women. While the fertility rate of Chadian women has decreased over the last decade, it remains among the highest in the world: 5.6 children per woman on average, in 2020. One of the proposed activities is aimed at providing a different source of income by contributing to the improvement of public space and hygiene practices, including the management of open defecation sites.

Not all identified vulnerabilities are prioritized around the proposed activities. This assessment of gender vulnerability to climate change describes the most significant gaps in the factors affecting women's vulnerability in N'Djamena. Some of them cannot be directly addressed as they do not fall within the scope of the city's urban resilience project. However, this tool can serve as a reference for the creation of other initiatives that require the identification of gaps and factors affecting the resilience and adaptive capacity of women and girls.

The review of the various social, economic and environmental aspects that we have addressed shows that women are leaving with a number of obstacles to their necessary adaptation to the effects of climate change. The elements collected during the survey indicate a series of gender gaps in family and livelihood production activities, in participation and in the power of expression and decision. These gaps, like those found at the macro level in education, employment, health and violence, determine the different ways in which men and women will be exposed to climate change and their ability to mitigate its effects through their adaptive capacities.

To reduce the risks of floods and droughts, women have developed spontaneous adaptive capacities that enable them to cope. From the fieldwork carried out, mutual aid between community members to overcome the lack of resources, to protect themselves and to rebuild, is crucial to develop adaptive capacity. The community is therefore a strong pillar of adaptation on which the deployment of the above-mentioned actions should be based. Community-based adaptation, based on traditional knowledge and strengths, is essential to implement incremental and sustainable adaptation.

To conclude, the gender gap vulnerabilities are significant and need to be reduced. Adaptation is a strong lever to drive actions that will act on these vulnerabilities in a holistic way while driving socio-economic development measures. The proposed adaptation measures will mainly affect women but we also believe that they should be largely involved in the deployment of these actions by being considered as actors of change. In fact, women represent a primary resource for adaptation through their experience, responsibilities and resilience. Therefore, we believe that gender-specific actions will allow a more sustainable, robust adaptation for a more resilient society.

# 1. INTRODUCTION

## 2.1 Why a study of gender-related vulnerabilities in N'Djamena?

In recent years, the impacts of climate change have become increasingly visible: high heat, episodes of strong and hot winds, drought and heavy rainfall. Climate change also promotes the occurrence of unpredictable extreme events and greater variability in rainfall patterns. This greater variability increases uncertainties and poses considerable risks to the most vulnerable communities.

In Chad, women represent more than half of the country's population (51% according to the results of the General Population and Housing Census, RGPH, 2009). They are a vulnerable group for many reasons: biological (pregnancy, menstruation), cultural and socio-economic (gendered division of activities). Indeed, whatever the sector of activity, in addition to productive work, women continue to assume most of the domestic and family care tasks.

In the context of climate change, women and men are affected differently. What makes women more vulnerable to these events are on the one hand their particular dependence on natural resources (water, firewood, etc.) which are directly affected by the pressures of climatic hazards and on the other hand their low capacity to adapt, linked to their lack of autonomy and limited access to economic and social resources that could address this vulnerability.

Indeed, access to natural resources and the response to basic needs (housing, food, fertile land, water and energy) pose problems for all, women and men. However, because women are responsible for the care and maintenance of the family, these difficulties are exacerbated for women. Social relations of inequality between men and women accentuate women's vulnerability by limiting their access to control of economic resources, knowledge, personal and collective decisions and places of power. The consequences of climatic hazards, in addition, tend to increase the forms of violence at the family level and in the public space.

The Global Center on Adaptation (GCA) commissioned a climate gender vulnerability gap assessment in N'Djamena. The objective is to assess vulnerability to climate change from a gender perspective in order to integrate it into adaptation measures proposed under the World Bank's N'Djamena Urban Resilience Project. This study is part of the support that the GCA provides to national government projects funded by international financial institutions, such as the World Bank, that aim to accelerate and increase the impact of climate change adaptation.

The core of the GCA's mission is to provide solutions to climate change by serving as a link between study, research, project design and funding groups. By doing this, the CGA is positioning itself as a trusted advisor to national and municipal governments, but also to development partners, who seek to innovate and accelerate and give more weight to climate adaptation actions.

As a linking body, the motivations of the GCA are different. Success is measured by the replicability of the proposed climate adaptation solutions and the potential takeovers of these solutions by other actors such as countries, financiers, ... Thus, his work focuses not only on offering qualitative solutions but also on designing project modalities that can be adapted, transferred and scaled up.

It is important to note that the GCA maximizes its ability to travel the vertical spectrum, through access to the highest level of policy makers and the most vulnerable local communities. In order to be a trusted advisor, the GCA pays particular attention to what works from an adaptation perspective but also to what brings equitable and inclusive results.

The **City Adaptation Accelerator (CAA)** is a new initiative managed under the GCA Water-Urban Program. The development objective of the City Adaptation Accelerator (CAA) is to help cities and countries strengthen their urban climate adaptation and resilience outcomes through better (1) understanding; (2) planning; (3) investments; and (4) governance and capacity building.

For the CAA program, the improved outcomes of urban climate adaptation and resilience are characterized by:

- ▶ Enhanced management of urban climate risks in cities and their suburbs;<sup>6</sup>

<sup>6</sup> Common climate risks include floods, drought, storms and fires. Risk management related to these hazards covers the full cycle of (a) prevention, (b) mitigation, (c) protection, (d) emergency response and (e) recovery.

- ▶ Better spatial planning that is more adaptive in the face of climate change at the regional and municipal levels;<sup>7</sup>
- ▶ Improved management of water resources for more equitable access to ecosystem benefits;<sup>8</sup>
- ▶ Improving the quality, coherence, inclusiveness and integration of urban drinking water, sanitation and solid waste management services; and<sup>9</sup>
- ▶ Improved livability and public health in the face of climate risks arising from heat stress and disease.

In Africa, CAA partners with international development organizations (such as the World Bank) and national and local governments to accelerate and amplify climate adaptation and high-impact resilience building efforts in cities. Specifically, CAA flexibly deploys a range of decision support tools as well as on-demand technical and financial advisory services – enabling cities to address climate-related urban challenges identified as the biggest obstacles to long-term development.

The World Bank and the Government of Chad plan to address the recurrent problem of flooding in N'Djamena through a new urban resilience project, in order to act on the physical well-being, property and livelihoods of the population and on the city's ability to be an engine of growth.

This study of gender vulnerabilities to climate change, commissioned by the GCA, aims to contribute to the preparation and implementation of this Urban Resilience Project in N'Djamena funded by the World Bank. The N'Djamena Urban Resilience Project (P177044) seeks to reduce the impact of flooding and strengthen urban services and climate resilience, while reducing the vulnerability of women and men to climate change.

## 2.2 The N'Djamena Urban Resilience Project

The N'Djamena Urban Resilience Project has a budget of US\$150 million, provided by a grant to the Government of Chad. To achieve these objectives, the N'Djamena urban resilience project is divided into three components:<sup>10</sup>

<b>1</b>	Infrastructure flood protection and drainage	<b>2</b>	Climate-resilient urban planning and services	<b>3</b>	Support management and monitoring project and
Gender-transversal actions and promotion of access to green jobs					

### **Component 1 - Flood Protection and Drainage Infrastructure**

The first component focuses on adaptation to flood hazards through green and grey infrastructure. The aim is to protect selected areas of N'Djamena against recurrent flooding of river and rainfed origin.

This component combines structural and non-structural measures, including urban drainage and associated road works, and retention basins, with a strong focus on NBS.

It is expected that the associated work will contribute significantly to the creation of local jobs through different activities and investments.

The component seeks to fund priority investments in storm and river flood risk management, which can be implemented in the first three years of project implementation to generate quick gains for targeted beneficiaries.

Where possible, the project should rely on Nature-Based Solutions (NTS) to increase the acceptability and sustainability of the project's infrastructure. Based on a preliminary study of possible options, five categories of NFS (not mutually exclusive) are being considered at this stage:

<sup>7</sup> This will include elements related to erosion protection in coastal areas, along water bodies and in upstream watersheds.

<sup>8</sup> These efforts are expected to include not only strengthening the sharing of the benefits of ecosystem services, but also improving the livelihoods of communities through improved food security, better access to land, etc.

<sup>9</sup> These urban services will be contextualized with considerations on drainage and stormwater management.

<sup>10</sup> At the time of writing, the project is in the final phase of appraisal and the activities and components are subject to change.

**green corridors** along drainage infrastructure, which can be facilitated by the low density of some parts of the city;

**the renaturation of** watercourses and the development of banks, which would considerably reduce the problems of deterioration of the banks (particular attention should be paid to the risk of erosion);

**floodplains**, which, while a seemingly obvious choice, can lead to problems related to relocation needs;

- ▶ **urban and peri-urban gardening and orchards**, as emerging initiatives have met with success and have the advantage of creating productive land use in flood-prone areas;
- large-scale afforestation in the outskirts of the city** to increase the capacity of the soil to act as a buffer during floods.

## **Component 2 - Climate-resilient urban services and planning in N'Djamena**

This second component aims to strengthen climate-resilient urban services and planning. It would include the following proposed activities:

**Improve solid waste management** to reduce flood risks with a particular focus on the plastics recycling value chain. Throughout the activities supported, the objective is to create an enabling environment for private sector investment while providing the analytical and institutional basis for the design of future dedicated and larger-scale SCM interventions.

**Strengthening flood early warning** and disaster preparedness in N'Djamena. As well as the dissemination of information and public awareness on harm reduction, based on an inclusive and gender-sensitive approach that takes into account the specific information needs of women and young people.

Promote sustainable and risk-informed urban planning and management.

- ▶ **The integration of CRM** considerations into technical and strategic aspects.

## **Component 3 - Project management and monitoring support**

This component includes support for the implementation of activities related to climate change adaptation, financial management, procurement, environmental and social management, monitoring and evaluation, communication and knowledge management.

### **Transversal actions**

The objective of the cross-cutting activities is to facilitate and promote gender and access to green jobs. This will be achieved in particular through:

**a gender-focused training programme** to develop the skills of small and medium-sized enterprises (SMEs) on relevant **recycling tools and techniques** as well as entrepreneurial skills by focusing on the most relevant recycling value chains, including plastic waste;

**manual collection**, collection and transfer of waste to intermediate sites in areas where vehicles cannot access, through local associations supporting the employment of women and young people;

training and equipment for **the citizen use of digital technologies** to collect data relevant to urban planning and services, such as mapping of landfills, clogged networks and stagnant water basins;

## 2.3 Mission Objectives

One of the objectives of the GCA's CAA City Adaptation Accelerator program is to provide technical assistance to projects aimed at improving the adaptive capacity of cities to climate change. To meet this objective, the GCA commissioned the consulting firm Groupe Huit to conduct this assessment of gender vulnerabilities to climate change, in order to gain a more accurate understanding of vulnerabilities and gender gaps and their impact on adaptive capacity to climate change.

This study is a contribution to the World Bank's Urban Resilience Project to take into account gender vulnerabilities and integrate cross-cutting actions, as part of the project's investments, that help reduce these gaps, catalyzing the adaptive capacity of the population of N'Djamena. It should make it possible to identify and assess the main gender-related vulnerabilities to climate risks and in particular with regard to floods. Similarly, the activities identified should be accompanied by indicators to measure their contribution to reducing gender differential vulnerability gaps.

## 3 METHODOLOGY FOR CARRYING OUT THE STUDY

### 3.1 Methodological framework

In the context of climate change adaptation, one of the most important definitions is that contained in the IPCC's Fifth Assessment Report, which describes the impacts of climate change in terms of exposure, sensitivity and adaptive capacity.



Figure 1: Methodology for climate risk assessment

Source: C40 Cities Climate Leadership Group based on IPCC definition

Scientific reports assume that climate change will wreak more havoc in African countries compared to other continents due to Africa's dependence on natural resources, the form of rain-fed agriculture (Dixon et al., 2003), and their limited adaptive capacity (Olsen, 2006).

According to the IPCC, vulnerability is the propensity or predisposition to be negatively affected.<sup>11</sup> Vulnerability includes a variety of concepts and elements including sensitivity or susceptibility to harm and lack of adaptive capacity (IPCC, 2014). Sensitivity is the condition of predisposition of the inherent attributes of a system, referring to a cultural, political and socio-economic dimension that allows people to cope with stress (Cutter et al, 2009; Shepard et al, 2012). Adaptive capacity represents the ability of a system to adjust to a disturbance to moderate potential damage, exploit opportunities, or cope with consequences (Gallopín 2006, IPCC 2014).

The degree of vulnerability of a community increases or reduces the risks in the face of a climatic hazard. To study the vulnerability of a specific community, especially women, to climate change, it is important to look at multiple factors that characterize this vulnerability, namely: human capital, economic capital, social capital, access and availability and also the exclusion of women from the decision-making process. It is on the study of these different factors that we focused in order to understand the vulnerability of women to climate change in N'Djamena and more particularly in the face of flood risk. The study of these categories also helps to understand women's adaptive abilities: their ability to cope and adapt to a hazard to avoid risk situations.

The city of N'Djamena has a very specific flood risk profile, which evolves throughout the rainy season from a rainfall predominance to a fluvial predominance. It is on the risk of flooding that this study of vulnerabilities focused. However, an analysis of women's vulnerabilities to other climate events such as rising temperatures and heat waves was also carried out.

The gender analysis grid used in this survey is based on the IPCC's analytical framework. The categories we have established to group gender gaps address USAID-defined areas of empowerment associated with women's vulnerability to climate change.

<sup>11</sup> IPCC, 2014: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Appendices - Glossary: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change

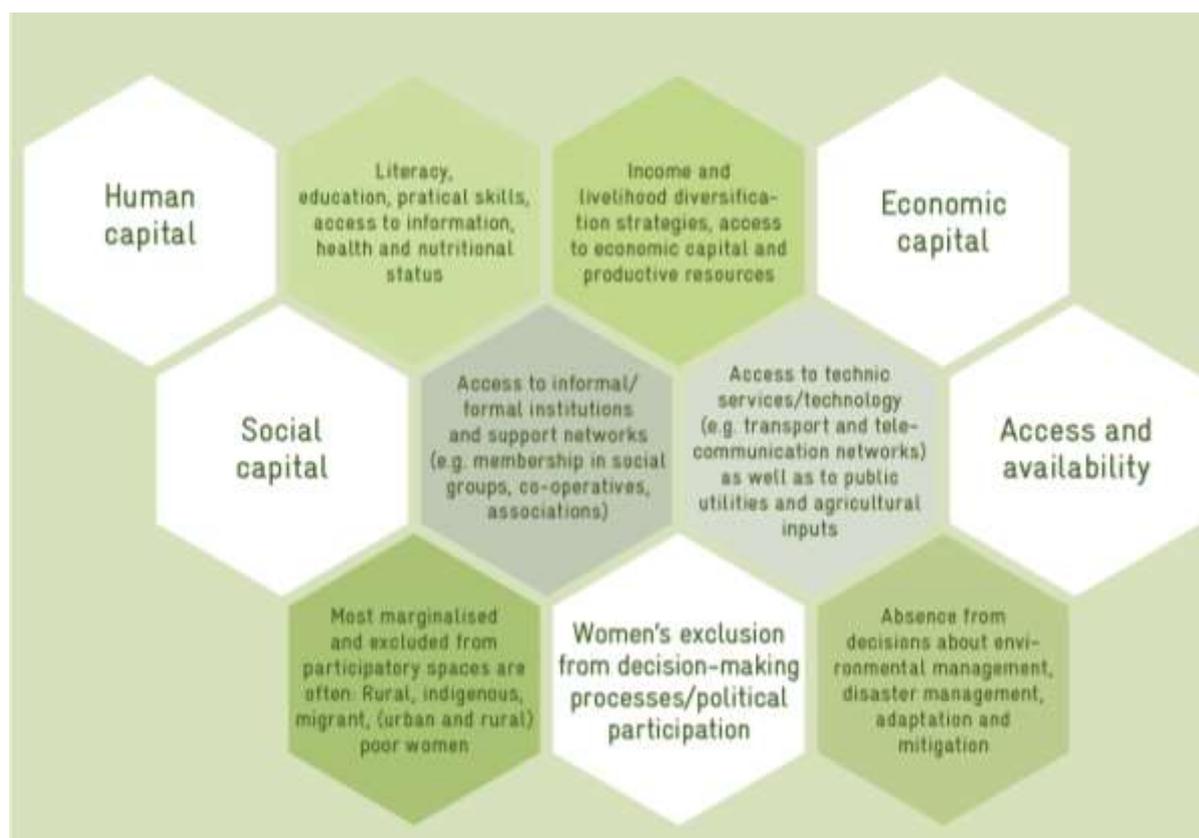


Figure 2: Five major factors affecting vulnerability and gender-specific ability to adapt to climate change.

Source: IPCC 2007,2014

This framework makes it possible to investigate the social situation and provide elements of understanding on the status, roles and responsibilities of women and men and on gender gaps . The data provided allow us to identify gender gaps and vulnerabilities that could be magnified in the face of climatic hazards.

By taking into account the geographical, socio-economic, meteorological and climatic factors of the population and its environment, and by adopting the perspective of women, this methodology makes it possible to define and assess the main risks faced by women in particular.

The work of collecting and analysing social gender relations is organised around the following categories:

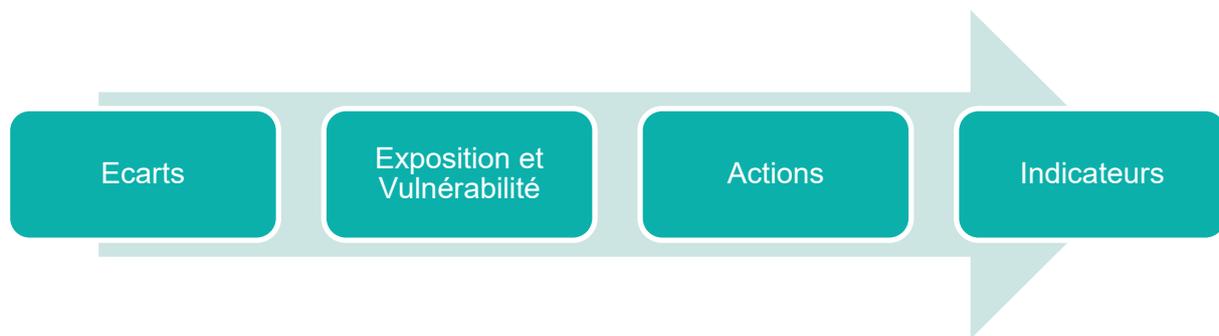
Human capital	Literacy, education, life skills, access to information, health status and nutrition.
Production	This category refers to income, time use, the distribution of time between productive and domestic tasks and care tasks <sup>12</sup> .
Resources	This dimension concerns ownership, access and decision-making power regarding productive resources such as land, livestock, agricultural equipment, consumer durables and credit and the diversification of livelihoods.

<sup>12</sup> Women's contributions to their families, communities and societies are often not part of the formal economy and do not reflect monetary value. This type of work, generally described as 'care work', includes the care of community members, natural property or future generations. Genanet (2013).

Decision-making participation	and	This dimension concerns leadership in the community, measured here by belonging to economic or social groups and public speaking.
Violence specific to women and urban spaces		This category refers to the planning of urban spaces and the place of women in the city as well as the circumstances that influence their safety.

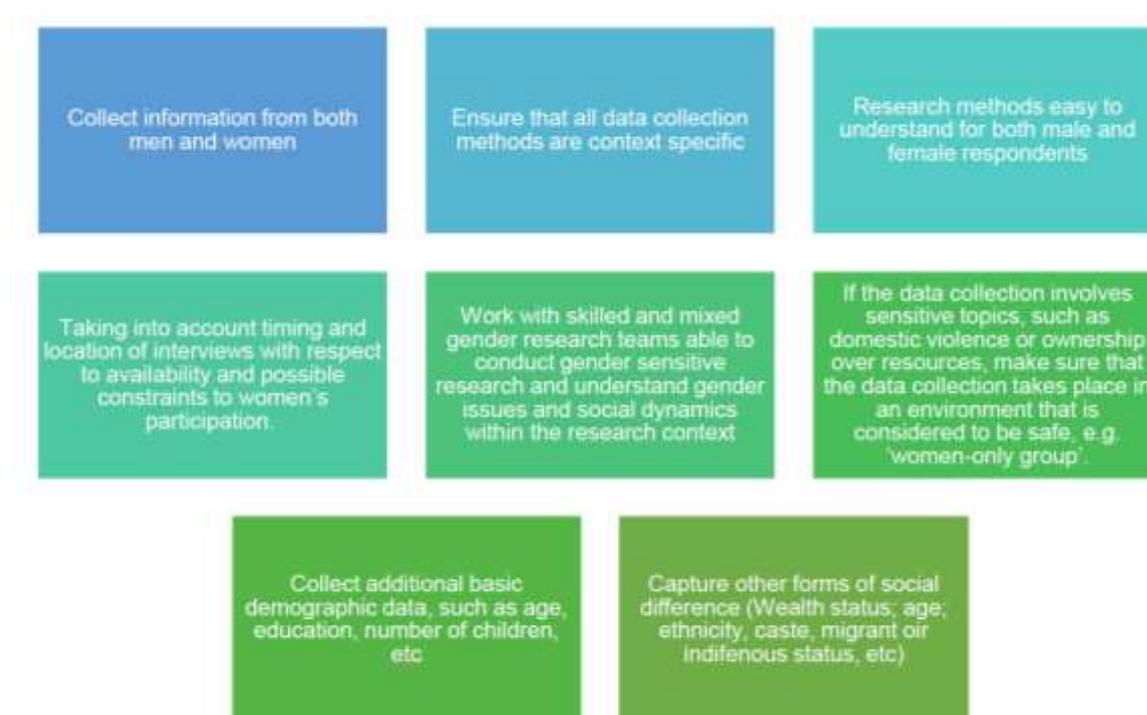
We first conducted a gender survey to identify all the gaps between women and men for each of the aforementioned categories to then analyze (i) how climate change had a specific impact on women and (ii) how gender inequalities impacted women's ability to adapt.

The identification of these gaps, as well as the opportunities identified during the surveys concerning women's adaptability, allowed us to identify certain actions to be implemented within the framework of projects and the associated indicators that measure the level of reduction of these gaps. The logic chain (gender gap - action - monitoring indicators for the project) is based on the gaps identified from macro-indicators at national level and information collected on the ground.



### 3.2 Gender-sensitive data collection strategy

The data collection and analysis strategy was guided by gender-sensitive principles:



For this diagnosis prior to the project, a work of analysis of macro data was done from the beginning (Law, policies, norms, customary rights, legal status of women, anthropological data on beliefs, gender stereotypes, gender-specific data (health, education, employment, training, violence), in order to allow a first assessment of gender gaps in the socio-cultural context of Chad and N'Djamena. This first identification allowed the construction of a survey methodology that was developed in the start-up report.<sup>13</sup>

The fieldwork aimed to clarify, in the socio-cultural context of N'Djamena, on the one hand the gender gaps and vulnerabilities and on the other hand the possible impacts of climate change and floods on gender relations.

The strategy used for this qualitative survey was initially to conduct individual interviews at the household level to collect initial data on gender gaps and social and environmental vulnerabilities.

In a second and third phase, focus groups and participatory survey exercises with field observations were organized in the different survey areas. These last two exercises, which make room for group dynamics and encourage speaking, have made it possible to explore different points of view around the themes of inquiry.

This approach has made it possible through the use of these different collection tools (interviews, observations, focus groups, participatory surveys, and document analysis) to triangulate data, analyses and interpretations for verification and confirmation of hypotheses. It has also made it possible to strengthen the collection of information and to achieve information saturation on many topics.<sup>14</sup>

At the end of the fieldwork, a team workshop allowed the collective analysis of the data and the validation of the conclusions<sup>15</sup>.

### 3.2.1 Semi-structured individual interviews at household level

These in-depth interviews involved two (2) levels of investigation:

- ▶ Data on social vulnerability related to gender: approach to inequalities (i) related to the sexual division of labor in the spheres of production, and reproduction, (ii) participation in community activities and/or local organizations, (iii) control and decision-making capacity over the use of goods, income, credits, family decisions;

<sup>13</sup> See the survey tools in the appendix 7.

<sup>14</sup> See summary table of methodologies used Annex 6.

<sup>15</sup> See Team Workshop Program in appendix 3.

- ▶ Data on environmental vulnerability and the consequences of gender inequalities: an approach on the gender impacts of floods.

At this stage, an inventory of the tasks performed by women or girls and by men or boys was being prepared; gender constraints related to these activities, such as the issue of working time; and determine the benefits (symbolic or economic). This analysis questioned the access, use, management and control of family resources as well as aspects of participation in community activities, groups, local organizations and institutions.

Twelve in-depth interviews were conducted. They concerned 7 households located in the three survey areas and 12 persons, 7 women and 5 men.

The selection of the participants was carried out by the neighbourhood delegates on the basis of criteria given and defined at the start.

### 3.2.2 Focus groups (FG)

Two types of Focus groups have been organized

- ▶ **16 focus groups with the population of the three zones (156 people).** They aimed to continue questioning social vulnerabilities and the gender-related impacts of climate change and floods.
- ▶ **3 focus with groups of individual informants (15 persons):** Heads of technical services of district communes; district delegates, imams.

The 16 focus groups with the local population were disaggregated by sex with:

- ▶ 10 FG with a total of 104 women, including 6 divided by age groups, 1 FG with organized women (organizations and informal groups of women and girls and 3 FG Marche workshop (1 per neighborhood),

FG Organized	Women	FG – 36 years old		FG over 36 years		FG Walking Workshop		Total women	
1	12	3	24	3	22	3	46	10	104

- 6 FFs with a total of 52 men, 4 of whom are divided by age groups

FG men ts ages	FG – 36 years old		FG over 36 years		Total men	
2	3	24	1	9	6	52

For the selection of participants, the team relied on the neighbourhood delegates for their knowledge of the population and especially for their ability to mobilize the groups.

The 3 focus groups with particular groups of informants brought together 15 men.

FG Heads of Services	FG neighbourhood delegates		FG imams		Total men	
1	4	1	5	1	6	15

### Exploratory observation walk

**3 exploratory walks with 43 women** were organized, a march for participatory observations in each neighborhood with the presence of 4 people for the town halls and neighborhoods.<sup>16</sup>

Walia number of participants	number of	Amtoukoui number of participants	number of	Senegalese market number of participants	Total Women	
1	15	1	17	1	11	43

The marches were organized around the following steps:

<sup>16</sup> The participation of neighbourhood delegates or officials at the level of town halls was sought. In this context, the following participated: Walia the delegate, to Amtoukoui, a representative of the delegate, Senegalese Market two employees of the town hall participated in the workshops but not in the march.

- 1- **FG Workshop exchanges and** collective analysis around the issues of climate change and flooding, around the issues of displacement, insecurity and gender-based violence in the neighborhood (counted in the FG)
- 2- **An exploratory walk with** surveys on physical characteristics in relation to:
  - ▶ Climate change and with security
  - ▶ Social dynamics and the organization of spaces
  - ▶ Local public organizations and institutions
- 3- Data analysis and recommendations workshop

The itineraries were defined in advance during a focus group with the women of the neighborhood concerned. They choose the places and stopping points according to the climate risks and the risks of insecurity that they experience on a daily basis. (Annexe 3: Maps of the routes followed during the exploratory walks. )

During these marches, a participatory mapping of climate impacts/risks and gender-based violence was done. It was then associated and superimposed on an analytical mapping presenting elements of the territory related to the issues of risk and climate change and in particular floods in order to produce a synthesis of the risk.

### 3.2.3 In-depth interviews

Twenty-one in-depth interviews were conducted, some of which were group interviews with 2 or 3 people. Those selected for the in-depth interviews did not participate in the other data collection methodologies, namely: Focus Groups and Exploratory Walks. The list of actors was proposed in the start-up report and validated by the GCA.

Interviews targeted individuals, public services and NGOs. These interlocutors were targeted for their experience in relation to the topics of gender, equality, climate, flooding. These interviews sought to collect data, experiences, comments and reflections from their experiences:

Information on public services and NGO stakeholders, their activities, projects, field experiences in the fields of climate change, floods, gender approach, analyses and experiences of flood issues

- ▶ Flood and disaster data
- ▶ Data on gender-related social vulnerability
- ▶ Data on environmental vulnerability and the consequences of gender inequalities
- ▶ Data on urban planning documents

Their approach to the sexual division of labour in families, production, community and collective participation of women and youth, initiatives in emergency situations, women's adaptation initiatives;

These interviews also made it possible to collect additional information and data for analyses related to the experiences of the populations and the experiences of the interlocutors in terms of intervention during the last floods in N'Djamena, and to obtain information on the urban plan:

- ▶ Identification of non-construction areas in N'Djamena

The existence of a planned development programme in the target areas

- ▶ Future investments planned in the target municipalities: equipment, infrastructure, etc.

The results of the latest floods in N'Djamena: Number of households affected (number of women, men and children) and types of degraded infrastructure (number and condition)

- ▶ Knowledge of sanitation service providers
- ▶ Solid waste management data in N'Djamena
- ▶ The role of civil society actors
- ▶ The local strategy to reduce flood risks
- ▶ Identification of the necessary infrastructures to be carried out
- ▶ Knowledge of sensitive points (breaking point of dikes, faulty structures, shallows, ...) to consider in the urban space

## Definition of target neighbourhoods

At the beginning of the study, an analysis of the neighborhoods was carried out based on the criteria of climate vulnerability, social and religious composition, and discussions and exchanges in order to make a selection for field work. The proposals were discussed with the World Bank and the GCA.

Three districts were selected for the following reasons;<sup>17</sup>

- ▶ **Senegalese district** located in the **4th arrondissement**: was selected because of the age of the existing works, the proximity of the district to two large markets of N'Djamena and the influence of the Canal d'Amriguébé on the surrounding neighborhoods. This district has suffered floods whose origin is linked in particular to the lack of maintenance of the structures, the incivism and the lack of maintenance of the infrastructures. Predominantly Muslim neighborhood.

**Amtoukoui district of the 7<sup>th</sup> arrondissement** : the Amtoukoui district is highly vulnerable to flooding. Administratively it comprises a total of three Amtoukoui districts: Amtoukoui I, Amtoukoui II and Amtoukoui III. As part of the mission, the consultant mainly targeted the Amtoukoui I and II districts. It is an area under-equipped with basic infrastructure, the main reason for the floods. Mixed neighborhood from the religious point of view (Christians and Muslims),

**Walia district of the 9<sup>th</sup> arrondissement** : At the confluence of the Chari and Logone rivers and sparse by wetlands and brick production quarries, Walia and its surroundings are areas exposed to water stagnation. Predominantly Christian and animist, this peri-urban district is inhabited by low-income households whose activities revolve around market gardening and home services carried out mainly in the informal sector. Several "districts" make up the large Walia district: Goumna, Gardolet and Walia.

## 4 CONTEXT OF THE STUDY AREA

The study concerns N'Djamena, the capital of Chad, inhabited by more than 1.4 million inhabitants according to INSEED estimates. Three neighbourhoods, all covered by the WB project, were selected as target areas. These are the Walia district, the Amtoukoui district and the Senegalese district and their respective surroundings.

The city is located in the center-west of the country, at the confluence of the Chari and Logone rivers, on the right bank of the Chari. Being the 23<sup>rd</sup> province of Chad, N'Djamena is headed by a governor and a mayor of the city. N'Djamena is located about 10 km from the Cameroonian border to the west, and a hundred kilometers, as the crow flies, south of Lake Chad. This lake is mainly fed by the hydrographic network of the two rivers having their confluence at N'Djamena.

Like the territories of Chad, N'Djamena is suffering the effects of climate change manifested by irregularities in rainfall, floods, rising temperatures, dust and drought. Since the 1960s, the city and its surroundings have suffered all the hazards mentioned above. For example, N'Djamena has been heavily affected by flooding in 1999, 2001, 2007, 2010, 2012 and 2020.

These risks have had significant impacts causing the displacement of people, losses of economic activities and physical degradation such as bank erosion, collapse of shelters, etc. The target neighbourhoods and boroughs are representative of the city's level of exposure according to the following criteria:



Figure 1: Location of N'Djamena, Chad

<sup>17</sup> To see map Localization neighbourhoods Annex 2.

- ▶ Proximity to rivers and wetlands;
- ▶ Vulnerability of the neighborhood to climatic hazards;
- ▶ Presence of urban areas constituting problems of sanitation and drainage of rainwater;
- ▶ Proximity to areas of socio-economic attractiveness;
- ▶ Sociological profile of households.

As for the issue of gender, there is a political goodwill on the part of the Chadian government, even if actions are slow to follow. A gender policy framework was developed in 2011 but until today the issue of gender is not sufficiently penetrated in the social milieu. The urban and social landscape of the city of N'Djamena demonstrates a clear distinction of gendered activities due to traditions and religious factors. The choice of neighborhoods in study areas also incorporates this criterion of religion.

As the country is in a phase of political transition, public institutions have seen their intervention capacities reduced due to a lack of technical and financial resources. Under these conditions, the vulnerable nature of the study areas is found at the physical, social and structural levels.

## 4.1 Population growth

The city of N'Djamena has seen its population double in 20 years and it will reach probably 2 million inhabitants. The reasons for this explosive urban growth are a high number of children per woman (5.6 children per woman at national level in 2020<sup>18</sup>), but also a strong internal migration to N'Djamena (intra-national displacement rate between 7% and 20% depending on the security situation elsewhere in the country/region), at the national level), but also a strong internal migration to N'Djamena (intra-national displacement rate between 7% and 20% depending on the security situation elsewhere in the country/region).

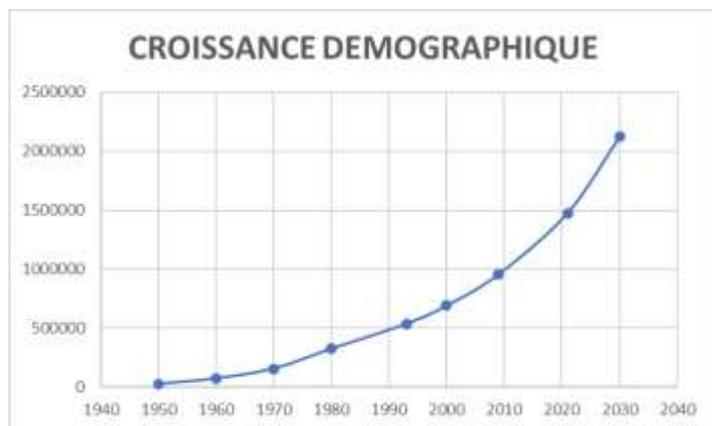


Figure 2: Population growth in N'Djamena

This growth is spatially reflected in urban sprawl not controlled by the public authorities. While the Chadian Government has made a great deal of efforts in recent decades, they are not up to the challenge of urban growth and the challenges associated with climate change: the lack of basic infrastructure (water, sanitation, drainage, energy and roads) is glaring.

## 4.2 Organization of the territory

Being the 23rd province of Chad, the city of N'Djamena is composed of 10 districts and 64 districts, <sup>19</sup>covering a total area of more than 500 Km<sup>2</sup>.

The city is headed by an elected Mayor and administered by a Governor appointed by presidential decree. They are the first representatives of the city. The governor's radius of influence extends beyond the perimeter of the city and encompasses small towns. <sup>20</sup>

The Mayors of the boroughs report to the Mayor and the Governor. At the smallest level, there are the neighborhood delegates. During the mission, the consulting team intervened at all scales according to the types of data sought.

In Chad, decentralization has been incomplete.

<sup>18</sup> <https://donnees.banquemondiale.org/indicateur/SP.DYN.TFRT.IN?locations=TD>

<sup>19</sup> To see map annex districts 2.

<sup>20</sup> The last election by popular vote dates back to 2012. Since the Mayors are either named or elected by indirect suffrage. The other mayors appointed after the 2012 election were appointed or chosen among local elected officials. Indirect suffrage at Chad: The selection of the mayor is decided in the City Council by the elected officials and not by the population.

Local authorities are not equipped or equipped to be autonomous as the texts provide. Borough municipalities do not have enough technical and financial resources to deal with urban, social and climate vulnerability issues.

Although they are close to the inhabitants, they do not have the capacity to mobilize resources to prevent risks and structure the protection capacities of citizens.

This weakness observed at the community level is found globally at the city level, particularly in the sanitation sector.

Institutional limitations are the main causes of poor management of urban services and the reasons for underinvestment in improving the living environment.

### 4.3 Urban planning and services

Today the city is under-equipped with infrastructure to meet the primary needs of the population. However, state-driven urban planning initiatives are to be highlighted. The PADUR project (Urban and Rural Development and Development Project), is an urban planning framework document that identifies priority projects in different municipalities including N'Djamena to build basic infrastructure. This document co-financed by the World Bank was developed in the 2000s. This document would have come to an end without any real result while the population in N'Djamena has almost doubled. The only planning document at the local level was the PUR (Master Urban Plan) drawn up in 1996.

Since then, various initiatives have been carried out in N'Djamena to strengthen urban policies and natural risk management frameworks, namely:

- ▶ An infrastructure mapping and prioritization exercise to increase the city's resilience to flooding was initiated by the government after the floods of the 2000s.
- ▶ An urban drainage plan for the city centre of N'Djamena was carried out in 2013 detailing studies on the necessary infrastructure.
- ▶ A detailed mapping of the urban area of N'Djamena was conducted between 2017 and 2021 with the objective of developing spatial data on the infrastructures of N'Djamena
- ▶ A project to develop the Canal des Jardiniers has been financed by the French Development Agency and aims to rehabilitate a canal within the city and the associated drainage network.

Despite these various actions, the lack of planning and intervention by local authorities leads to health risks for the population, particularly due to an almost total absence of solid waste collection. Similarly, the practice of open defecation has a high impact on increased health risks, especially during floods. It should also be noted the poor coverage of the pipe and rainwater drainage network, the lack of control of land use and buildings, etc.

All these urban anomalies weaken households which, in the event of floods, find themselves trapped resulting in human losses, losses of activities, material losses, risks of diseases and social conflicts.

Given the pace of growth, the needs are growing in terms of basic urban services but also in terms of preventive measures to protect against floods.

Based on field observations, the following gaps have been identified from the point of view of urban planning and services:

- ▶ Absence/insufficiency in terms of pipe and drainage infrastructure.
- ▶ Insufficient educational, health, cultural and community facilities, merchants, etc.,
- ▶ Insufficient urban public services: water, energy, sanitation.
- ▶ Fragility of the dike made of earth embankment.
- ▶ Institutional fragility at the level of communities and public management.
- ▶ Lack of knowledge and inappropriate practices of the populations.
- ▶ Urban insecurity.
- ▶ Social and residential precariousness.

The diagram below shows the need for infrastructure in the hygiene and sanitation water sector at the national level. The figures for the urban environment correspond to the realities of certain neighbourhoods.

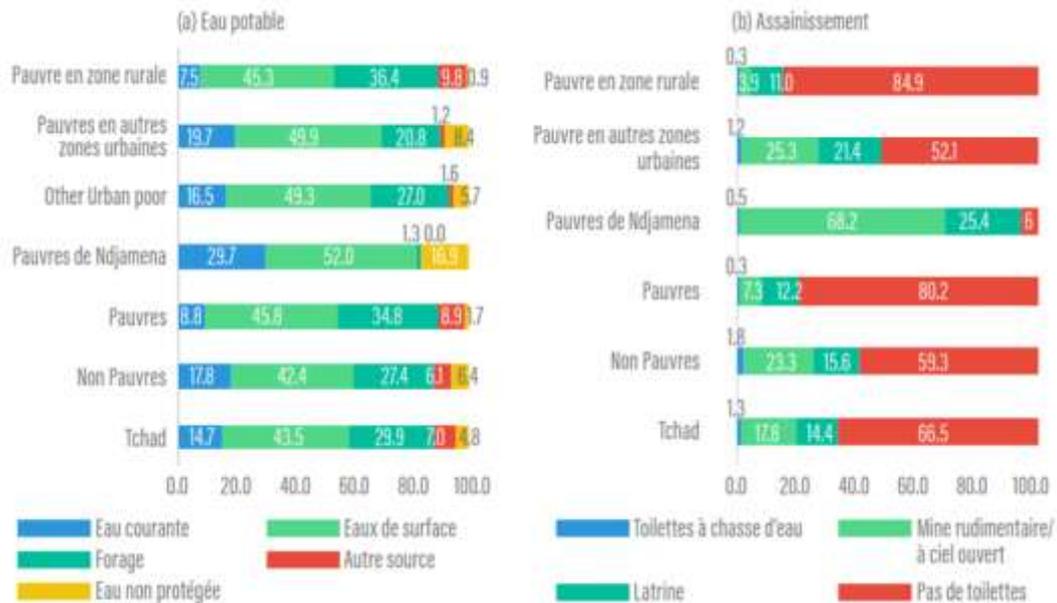


Figure 7: Access to basic services in Chad

Source: World Bank, 2021

#### 4.4 Market gardening in urban and peri-urban areas

Market gardening is an integral part of the urban landscape in Africa and ensures food security in cities marked by poverty and lack of access to resources. By creating jobs, urban market gardening is a significant source of income for some households. In N'Djamena, market gardening has become an important element and has continued to develop in connection with multiple factors related to the growth and development of the city. Today, vegetable farming occupies about 65,640 m<sup>2</sup> of land and is an important source of fresh vegetable supply for the city's population, which can be up to 90% in the dry season<sup>21</sup>.

Despite the advantages of such a practice, urban farmers mostly cultivate land over which they have no land control. In addition, the pressure of urbanization tends to limit the surfaces.<sup>22</sup>

<sup>21</sup> NdogonoudjiA. (2014), Vegetable production in the city of N'Djamena (Chad): State of play and perspectives. Revue scientifique du Tchad, CNAR, 7pages.

<sup>22</sup> Markhous N.A. Tee Has. Doungous, D.M., Amoukou, I., Abdourahamane B.. (2019). « Analysis of health risk Factors in the vegetable production Chain in the city if N'Djamena, Journal of Flood Research 8(3)



Figure 5 : Labour de la parcelle



Figure 6 : Confection des planches



Figure 7 : Laitue en pépinière à Millezi



Figure 8 : Arrosage d'une planche de roquette

Source: Markhous N.A, Tidjani A., Doungous, D.M., Amoukou, I., Abdourahamane B.. (2019). "Analysis of health risk factors in the vegetable production chain in the city of N'Djamena, Journal of Flood Research 8(3)

## 5 CLIMATIC ALEAS AND EXPOSURE

### 5.1 Regulatory framework

In addition to the Kyoto Protocol and the Paris Agreement, Chad ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1993. Unfortunately, to date, the country has no laws or decrees that govern adaptation to climate change. However, at the institutional level, the Government of Chad has set up a coordination system by Decree No. 1561/PR/MEEP/2018 of 10 September 2018 on the creation, attributions, composition and functioning of the Designated National Authority of the Green Climate Fund in Chad (AND-FVC).

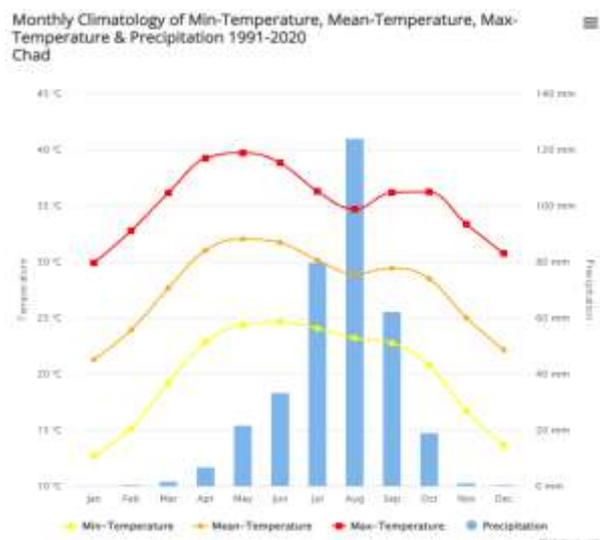
At the level of the city of N'Djamena, the situation is similar to that of the country because there is no local structure at the municipal level that is specifically responsible for climate and gender issues. The efforts made are being made by civil associations and NGOs and other international partners based locally.

### 5.2 Climatic hazards

#### 5.2.1 Projection of physical parameters

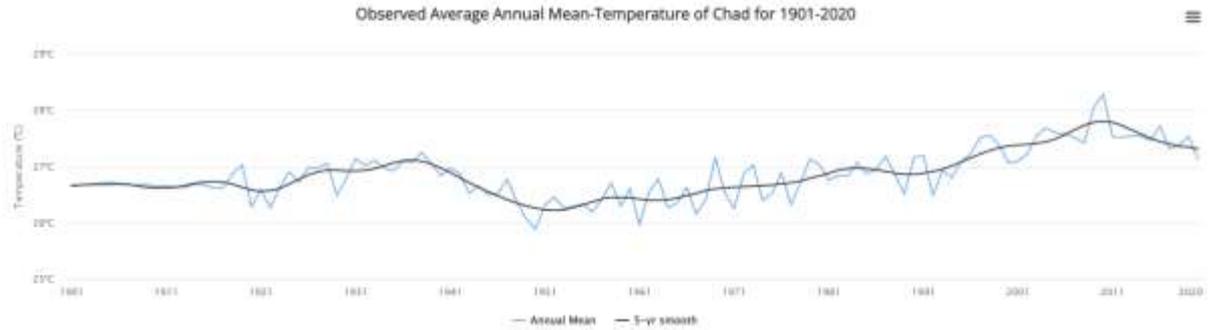
##### 5.2.1.1 Current climate

According to the World Bank's Climate Change Portal, the average temperature in Chad in 2021 was 27.7°C, with the hottest months of the year being April, May and June. Rainfall is concentrated between July and September, for an average rainfall of 1000 mm per year. About 70% of the rainfall in Chad is concentrated in the months of June-July-August.

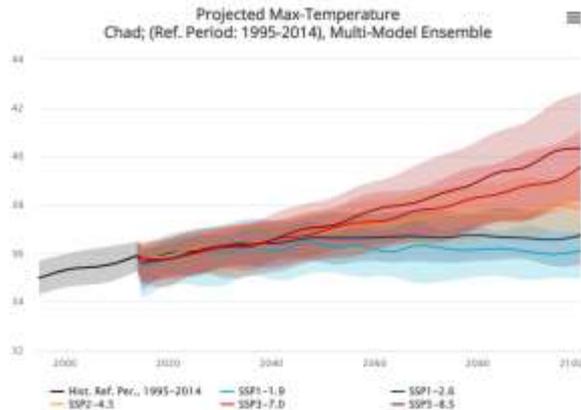
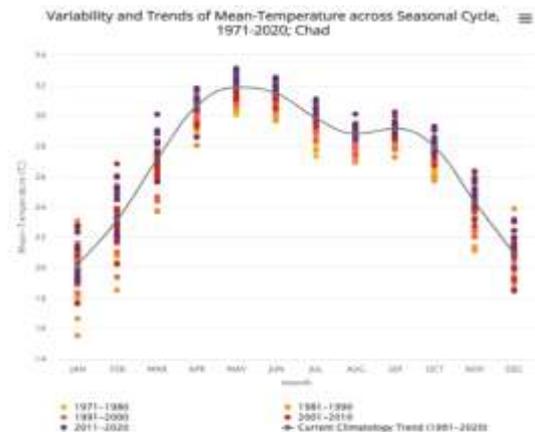


### 5.2.1.2 Evolution of temperatures

Between 1950 and 2020, the average annual temperature in Chad increased by 1°C.



However, there is a high variability in temperatures (4 to 6 degrees depending on the month) with a general warming trend over the hottest months of the year (+3°C on average between 1970 and 2020 for the months of May to September).

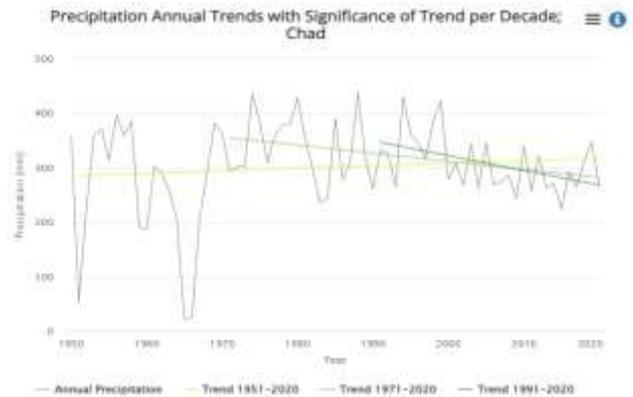
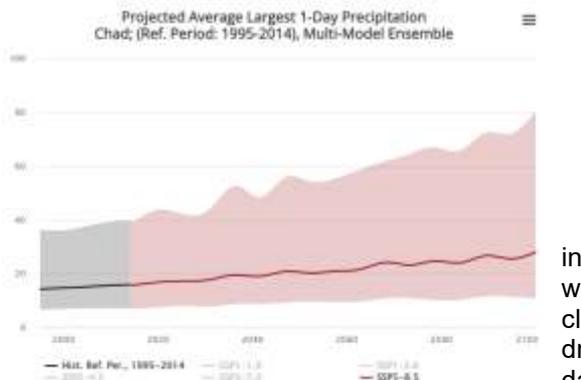


If we consider the IPCC scenario SSP5-8.5, by 2100, average temperatures will increase by 5°C compared to the period 1995-2014, and maximum temperatures could reach 43°C.

### 5.2.1.3 Evolution of precipitation

Annual trends over 1951-2020 show an increase in precipitation over the entire period. However, there is a decrease over the period 1970-2020.

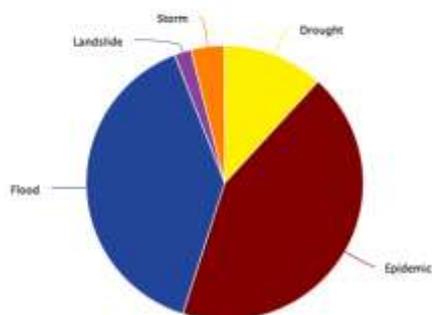
In general, it is considered that if the average annual rainfall varies little, it will be concentrated



in more intense rainfall events and more intense floods which will lead to longer dry periods. Data from the climate change portal confirm this scenario of increased drought episodes, with a decrease in the number of wet days, but an increase in volumes per rainy day.

## 5.2.2 Hazards

Average Annual Natural Hazard Occurrence for 1980-2020



Given the projections mentioned above, the following risks (identified in the proportions mentioned over the period 1980-2020) at the Chad level are likely to occur more frequently in the coming years, with higher intensities and, therefore, greater damage:

- ▶ Epidemics (43%)
- ▶ Floods (39% of hazards over the period)
- ▶ Drought (12%)
- ▶ Storms (4%)
- ▶ Landslides (2%) (nationally, not in the city of N'Dajmena)

### 5.2.2.1 Epidemics

Chad is a country affected by various diseases detailed below mainly categorized as vector-borne diseases. Changes in temperature, precipitation and humidity associated with climate change will affect the biology and ecology of vectors and intermediate hosts such as mosquitoes and will affect the risks of disease transmission<sup>23</sup>.

Illness	Origin	Additional information	Link to climate change
<b>Cholera</b>	Bacterial digestive infection that is transmitted either by ingestion of undercooked or soiled food (fruits and vegetables) or by ingestion of contaminated water.	The last epidemics in Chad date from 2011/2017/2018. Chad is estimated to have between 10,197 and 30,591 cases and a death rate of between 200 and 1020 <sup>24</sup> .	Increased pressure on water resources through longer periods of drought and greater frequency of heat waves
<b>Hepatitis E</b>	Infection due to a virus. Transmission occurs via the fecal-oral route, mainly through contaminated water	Between November 2021 and January 2022, 385 suspected cases of hepatitis E virus were identified and 12 cases of death were confirmed. Children under 10 years of age and have been particularly affected by this epidemic (about 20% of cases) <sup>25</sup>	
<b>Typhoid fever</b>	Salmonella-related bacterial disease		
<b>Malaria</b> <b>Malaria</b>	Vector transmission (Mosquito)	The incidence rate in Chad is 167.6 per 1000 people. In Chad, 1789 people died of Malaria between 2013 and 2017 <sup>26</sup> .	The increase in temperature and stagnant water caused by flooding promote the proliferation of mosquitoes.

<sup>23</sup> Githeko, A.K., Lindsay S.W., Confalonierie, E.W., Patw J.A.(2000). Climate change and vector-borne diseases: a regional analysis. Environment and Health

<sup>24</sup> Ending cholera, Global Roadmap 2030, Special Group on Cholera Control <https://www.gtfcc.org/wp-content/uploads/2020/04/gtfcc-mettre-fin-au-cholera-feuille-de-route-mondiale-pour-2030.pdf>

<sup>25</sup> <https://www.who.int/fr/emergencies/emergency-events/item/hepatitis-e-virus---chad>

<sup>26</sup> <https://www.acq.osd.mil/eie/afpmb/docs/dveps/chad.pdf>

<b>Yellow fever</b>	Vector transmission (Mosquito)	Less than 5% of the population who contracted yellow fever dies. 4 cases of yellow fever have been recorded since 2013 <sup>27</sup> .	Vector-borne diseases are the most diseases that seem to have the most link to climate change.
<b>Schistosomiasis</b>	Vector transmission (snail)	Highly endemic disease with an infection rate of 45% infected in 2015 <sup>28</sup> .	
<b>Dengue fever</b>	Vector transmission (Mosquitoes)	Between July and October 2020, 34,052 cases were reported in Chad <sup>29</sup> .	
<b>Chikungunya</b>			

Climate change through rising temperatures, pressure on water resources and floods therefore creates a fertile ground for the proliferation of diseases. However, strong regional and individual disparities are to be highlighted: the prevalence of fever is thus higher in N'Djamena than in other cities in Chad (36% against 23%) and the consequences of diseases such as malaria have a strong impact on the infant mortality rate. In this sense, malaria results in a decrease in the birth weight increasing the risk of infant mortality.<sup>30,31</sup>

### 5.2.2.2 Flooding

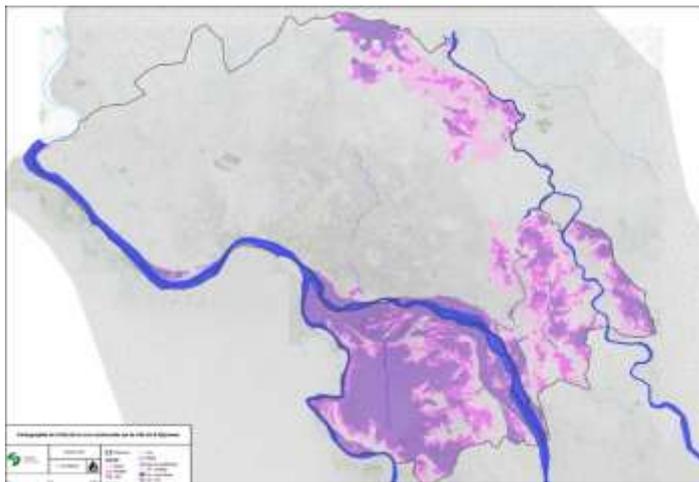


Figure 3: Map of flood zones in N'Djamena

Source: IGNFI report, 2021

Chad's capital, N'Djamena, is highly exposed to rain and river flooding. The city is located about 100 km south of Lake Chad, on the border with Cameroon, in a flat alluvial plain at the confluence of the Chari and Logone rivers. Most of the city is located on the right bank of the Chari, north of the river, with a gradient of about 4 m by 40 km, facing north rather than the natural outlet constituted by the Chari. Therefore, most of the city's buildings are located in a flood zone even though alluvium, consolidated by the retreat of Lake Chad over the centuries, has provided natural dikes used since the 1960s to protect the city from the overflow of the Chari. The city regularly suffers from rainfall (flash) floods, due to a weak drainage system and in some areas non-existent. These challenges

can also be partly attributed to the geological layouts of the city with low water absorption capacity, the poor operation and maintenance of the existing drainage infrastructure, as well as the accumulation of waste, including plastics, obstructing drainage channels.

According to field surveys, these factors of explanation are found with a higher risk of flooding in the districts of Walia Goumna, Walia Gardolet, Amtoukouï which do not have a drainage system or a waste transfer centre. On the other hand, in the S n galais and Repos districts, the floods of 2020 were able to have less impact thanks to the drainage system (existing but degraded) and better waste

<sup>27</sup> <https://www.acq.osd.mil/eie/afpmb/docs/dveps/chad.pdf>

<sup>28</sup> <https://www.acq.osd.mil/eie/afpmb/docs/dveps/chad.pdf>

<sup>29</sup> Ministry of Public Health and National Solidarity/World Health Organization (2020) file:///C:/Users/STAGE-ALL/Downloads/sitrep\_32\_chikungunya\_02\_octobre\_2020\_2.pdf

<sup>30</sup> Demographic and Health Surveys Program [https://dhsprogram.com/Countries/Country-Main.cfm?ctry\\_id=59](https://dhsprogram.com/Countries/Country-Main.cfm?ctry_id=59)

<sup>31</sup> Demographics and Health Surveys Program [https://dhsprogram.com/Countries/Country-Main.cfm?ctry\\_id=59](https://dhsprogram.com/Countries/Country-Main.cfm?ctry_id=59)

management. Integrated measures and solutions should therefore be considered to ensure that all factors of this issue are taken into account.

Neighborhoods	Drainage structure status	Waste Management Transfer Centre	Water height (m) during the 2020 floods	Duration of water stagnation (in months)	Flood risks
Walia Goumna district	Absent	0	2	2	Elevated
Walia Gardolet district	Absent	0	2	2	Elevated
Amtoukoui district	Absent	0	1	0,8	Elevated
Sénequalais and Rest districts	Insufficient and deteriorating	3	0.5	0,1	Medium

### 5.2.2.3 Drought and heat waves

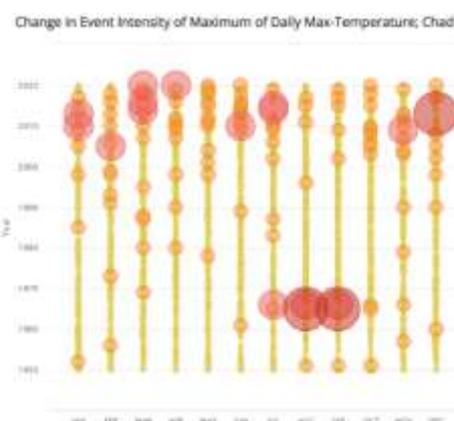
The third hazard in terms of frequency of occurrence according to the World Bank Portal is droughts. This phenomenon is a consequence of the increase in temperatures, and the disruption of rainfall regimes (lengthening of dry periods). There is also an increase in heat waves in the years from 2010 to 2020 compared to previous periods.

Bulb temperature is the temperature at which the air is saturated and retains as much moisture as it can in the form of water vapor. According to studies, the value of a wet thermometer above 35 degrees can be lethal in the long run. At this temperature, a person's sweat does not evaporate.

For the case of N'Djamena we did the exercise of calculating the bulb temperature by taking as a reference a temperature of **38.66 ° C**.

We took the current maximum temperature (36.18 ° C) in August considered to be the wettest month and added (+ 2. 48°C) maximum increase, forecast according to a scenario 8.5 by 2080. Regarding the humidity level, the more the temperature increases, the more the humidity level increases. Some studies indicate that for an additional degree, the humidity level increases by 7%. In 2080, it is expected an increase in the average temperature of about 2.59 ° C or an increase in the humidity level of about +17.5%. In August, the current humidity level can be around 75%.

Also in the event that the temperature is around 38.66 ° C in August and the humidity is 92%, **we would have a bulb temperature of 36.43 degrees**<sup>32</sup>.



## 5.3 Exhibition

In the Sahelian zone, where N'Djamena is located, floods, episodes of high heat and droughts described above affect environmental resources, infrastructure and, consequently, populations.

The environmental resources most impacted by climate change are water resources, soils and biodiversity, on which many human activities depend. The table below identifies the sectors exposed to each of the climatic hazards.

Hazards	Impacts	Exposed sectors	Factors aggravating exposure
---------	---------	-----------------	------------------------------

<sup>32</sup> <https://www.omnicalculator.com/physics/wet-bulb#what-is-the-wet-bulb-temperature>

Rising temperatures	<p>Decrease in drinking water supplies in the event of drought. Groundwater is the main source of water supply in N'Djamena and could be affected if there is no rainfall</p> <ul style="list-style-type: none"> <li>Loss of potential for agriculture and livestock, and associated income (Loss of crops, livestock)</li> <li>Loss of fishing potential and associated income</li> <li>Malnutrition</li> <li>Loss of life</li> <li>Loss of natural habitats for wildlife and avifauna</li> <li>Erosion</li> </ul>	<ul style="list-style-type: none"> <li>Livestock and Agriculture</li> <li>Water and sanitation</li> <li>Health/Nutrition, Environment</li> <li>Fishing</li> <li>Social</li> <li>Education</li> </ul> <p>Asrce</p>	<ul style="list-style-type: none"> <li>Reduction of biodiversity and degradation of productive and forest ecosystems</li> <li>Degradation of the quality of water resources, and weakening of aquatic ecosystems</li> <li>Urbanization</li> </ul>
	Disturbance of the rainfall regime	<ul style="list-style-type: none"> <li>Extension and multiplication of flood zones</li> <li>Destruction and loss of territories, habitats, community resources and associated revenues</li> <li>Disruption of certain natural and productive ecosystems, and associated revenues</li> <li>Loss of pasture</li> <li>Crop losses</li> <li>Loss of public and private infrastructure</li> <li>Diseases</li> <li>Loss of life</li> </ul>	<ul style="list-style-type: none"> <li>Water and Sanitation</li> <li>Breeding</li> <li>Agriculture</li> <li>Health/Nutrition</li> <li>Environment</li> <li>Fishing</li> <li>Social</li> <li>Trade, Infrastructure and Housing</li> <li>Transport</li> <li>Tourism</li> </ul>

Source: Group Eight

- Field surveys have made it possible to measure the exposure of populations through the number of collapsed houses and the number of displaced people per district.

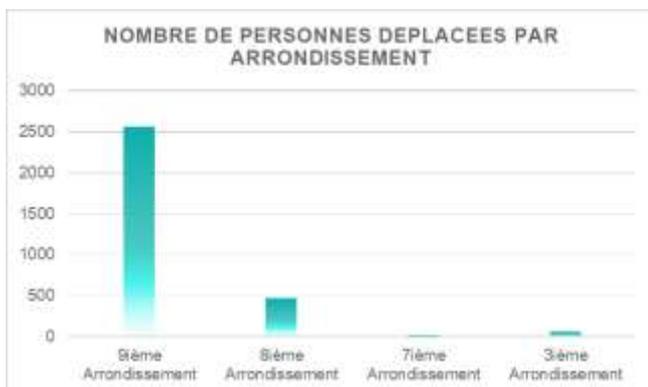


Figure 5: Number of displaced persons by district



Figure 6: Number of collapsed houses by borough

Sources: Ministry of the Interior and Office for the Coordination of Humanitarian Affairs, United Nations

According to data collected (above) from the N'Djamena City Hall, the Ministry of the Interior and *the Office for the Coordination of Humanitarian Affairs* OCHA, the most affected district is the 8<sup>th</sup> arrondissement but it is in the 9<sup>th</sup> arrondissement that there were more displaced people in 2020. In these two municipalities, the level of exposure is about the same but the ability to adapt is different. Because of the widespread precariousness observed in terms of types of construction, sources of income and a lack of infrastructure, households in the 9<sup>th</sup> arrondissement tend to systematically lose their shelters during floods. Due to lack of resources, these populations do not have the capacity to adapt while their residential areas are covered by water for 2 to 3 months. Although there are more collapsed houses in the 8<sup>th</sup> arrondissement, the populations of this commune have a capacity for adaptation that has allowed them to stay on site, and preserve their activities.

## 5.4 Institutional context

The institutional framework and governance associated with climate change in developing countries is underdeveloped and unstructured. Climate change adaptation planning is mainly at the national level with the development of the National Climate Change Adaptation Plan finalized in 2021 for Chad. This document proposes actions and adaptation measures throughout the country. In parallel, Chad has developed programmatic documents to combat climate change, namely a first National Communication on Climate Change in 2001 and a second in 2013. A third is being formalized. Finally, in 2017, Chad adopted two important strategies, namely the National Environment Policy and the National Strategy to Combat Climate Change.

In Chad, there is no specific ministry on climate change. Several ministries may be concerned by the implementation of such policies (Ministry of the Environment, Fisheries and Sustainable Development, Ministry of Land Affairs, Development of Haiti and Urban Planning, Ministry of Urban and Rural Hydraulics, etc.). . Adaptation to climate change is therefore multi-sectoral.

However, it is important to emphasize that the actions set out in the national plans are not communicated or translated at the municipal level even though adaptation is a framework for action that is mainly local and contextualized allowing greater efficiency. Indeed, the field visits showed that the documents relating to climate adaptation are not known by the technical services of the district municipalities. In addition, the overlapping of the competences of the technical services of the central municipality with those of the district municipalities, not to mention the decentralized technical directorates of the ministries, would also be at the origin of the weak institutional capacity for adaptation, in addition to the technical and financial shortcomings.

Indeed, although they are close to the inhabitants, local authorities do not have the capacity to mobilize resources to prevent risks and structure the protection capacities of citizens. This weakness observed at the community level is found overall at the city level, particularly in the sanitation sector.

<sup>33</sup>It is important to note that this institutional organization is recent and dates mainly from 2000 following the promulgation of Organic Law No. 002/PR/2000 of 16 February 2000, on the status of regions, departments and municipalities, marks the transition from deconcentration to decentralization. It adopts three levels of local government and refers the status of rural communities to another organic law, Act No. 007/PR/2002 of 5 June 2002. Act No. 009/PR/2005 of 15 July 2005 grants the city of N'Djamena special status. The city consists of a municipality and municipal boroughs, each with legal personality and financial autonomy. The city is divided into 10 districts, which include 69 districts.

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<sup>33</sup> <https://www.sng-wofi.org/country-profiles/TCHAD.pdf>

COMPÉTENCES SECTORIELLES DES COLLECTIVITÉS TERRITORIALES

	PROVINCES	DÉPARTEMENTS	MUNICIPAL LEVEL
<b>1. Administration publique générale</b>			Délivrance acte d'état civil ; Police administrative
<b>2. Ordre et sécurité publique</b>	Maintien ordre et sécurité des biens et des personnes	Maintien ordre et sécurité des biens et des personnes	Maintien ordre et sécurité des biens et des personnes ; Police administrative
<b>3. Développement économique et transports</b>	Participation à l'élaboration des plans de développement socio-économique et à l'aménagement du territoire ; Promotion commerce, industrie, artisanat et tourisme ; Contribution à l'élaboration du schéma régional des transports	Participation à l'élaboration des plans de développement socio-économique et à l'aménagement du territoire ; Promotion commerce, industrie, artisanat et tourisme ; Contribution à l'élaboration du schéma régional des transports	Participation à l'élaboration des plans de développement socio-économique et à l'aménagement du territoire ; Contribution à l'élaboration du schéma régional des transports ; Voierie urbaine, parc publics, transports urbains, tourisme local
<b>4. Protection de l'environnement</b>	Création, gestion, protection et entretien forêts, parcs et aires protégées, sites naturels ; Protection faune et flore et préservation ressources en eaux souterraine et superficielle ; Elaboration plans lutte contre feux de brousse et délivrance autorisations d'amodation de chasse	Création, gestion, protection et entretien forêts, parcs et aires protégées, sites naturels ; Protection faune et flore et préservation ressources en eaux souterraine et superficielle ; Elaboration plans lutte contre feux de brousse et délivrance autorisations d'amodation de chasse	Création, gestion, protection et entretien forêts, parcs et aires protégées, sites naturels ; Protection faune et flore et préservation ressources en eaux souterraine et superficielle ; Elaboration plans lutte contre feux de brousse et délivrance autorisations d'amodation de chasse
<b>5. Foncier, logement et services publics</b>	Avis à l'élaboration plans urbains de référence et schémas directeurs d'aménagement et d'urbanisme	Avis à l'élaboration plans urbains de référence et schémas directeurs d'aménagement et d'urbanisme	Approbation et encadrement projets de développement urbain ; Délivrance permis de construire, attribution des parcelles des autorisations d'occupation du domaine ; Appuis aux services sociaux de base (eau potable)
<b>6. Santé</b>	Gestion, entretien structures sanitaires ; Recrutement et gestion personnel d'appui, Application réglementation hygiène publique et élaboration carte sanitaire	Gestion, entretien structures sanitaires ; Recrutement et gestion personnel d'appui, Application réglementation hygiène publique et élaboration carte sanitaire	Gestion, entretien structures sanitaires ; Recrutement et gestion personnel d'appui, Application réglementation hygiène publique et élaboration carte sanitaire
<b>7. Culture et loisirs</b>	Création et gestion aires de manifestation culturelle, entretien musées, bibliothèques, équipement associations sportives et culturelles	Création et gestion aires de manifestation culturelle, entretien musées, bibliothèques, équipement associations sportives et culturelles	Création et gestion aires de manifestation culturelle, entretien musées, bibliothèques, équipement associations sportives et culturelles
<b>8. Education</b>	Education, alphabétisation promotion des langues nationales et formation	Education, alphabétisation promotion des langues nationales et formation	Education, alphabétisation promotion des langues nationales et formation
<b>9. Protection sociale</b>	Entretien et gestion structures de réinsertion sociale et d'aide aux personnes démunies	Entretien et gestion structures de réinsertion sociale et d'aide aux personnes démunies	Gestion, entretien structures réinsertion sociale et aide aux personnes démunies ; Recrutement et gestion personnel

Source: <https://www.sng-wofi.org/country-profiles/TCHAD.pdf>

## 6 ANALYSIS OF GENDER VULNERABILITY IN THE FACE OF CLIMATE CHANGE

### 6.1 Legal framework for the protection of women and gender equality

The presentation of the legal and administrative framework aims to provide information on the dynamics of the context for women's rights and the integration of gender issues into policies and programmes at the national level.

Chad relies on a number of national, regional and international instruments that affirm its commitment to reducing all forms of inequality between women and men.

These are:

#### 6.1.1 International legislation

The Convention on the Elimination of All Forms of Discrimination against Women (CEDAW);

- ▶ The Convention on the Rights of the Child;
- ▶ The African Charter on the Rights and Welfare of the Child;
- ▶ The Beijing Declaration and Platform for Action;

The African Action Plan (AAP);

- ▶ The Dakar Declaration adopted by the World Education Forum in Dakar;
- ▶ The United Nations Millennium Declaration;
- ▶ The Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa;
- ▶ The Solemn Declaration on Gender Equality of the African Union;
- ▶ The Gender Policy of the Economic Community of Central African States (ECCAS).

These international agreements and frameworks have been ratified and diplomatically assumed by the Chadian government. This implies that, even if there is a gap between these international tools and national realities, the government is to some extent aware of the priorities of the international agenda. Similarly, these and other instruments or agreements can contribute to increasing the importance that the Government of Chad attaches to the creation and operationalization of policies aimed at gender equality.

#### 6.1.2 National legislation

Article 14 of the Chadian Constitution guarantees the equality of all before the law without "distinction as to origin, race, sex, religion, political opinion or social position". It provides for "the elimination of all forms of discrimination against women and the protection of their rights in all areas of private and public life". However, the Constitution also recognizes customary law as an authorized source of law, although in some parts of the country unfavourable status is granted to women, particularly with regard to access to land and inheritance.

A National Gender Policy was published in 2011 and the Ministry of Women, Family and Child Protection is responsible for coordinating it.

The new criminal and criminal procedure codes, adopted in 2017, have strengthened the protection of the rights of certain vulnerable groups: the minimum age for marriage has been raised to 18 years; the criminalization of female genital mutilation (FGM) and trafficking in persons.

Other roadmaps or policies reflect efforts to support gender equality, women's empowerment and the inclusion of vulnerable people.

- ▶ Action Plan for its implementation of gender policy (PA-PNG 2019-2023)
- ▶ Roadmap to combat child marriage and female genital mutilation in Chad 2019-2021.
- ▶ Ratification in 2018 of the Convention on the Protection of Persons with Disabilities

The national social protection strategy of 27 July 2015, which aims to improve equitable access to basic social services.

- ▶ The National Strategy to Combat Gender-Based Violence (2014)
- ▶ The National Strategy for Inclusive Finance in Chad, SNFIT (2017-2030)

The National Health Development Plan (PNDS) 2018-2021, for an integrated, efficient and resilient health system.

While the legislative framework affirms equality between women and men, law enforcement is still lacking. The absence of a new personal and family code represents an obstacle to the protection of women against discrimination, particularly in relation to religious and customary practices, particularly in matters of inheritance rights or in the face of unequal status between legitimate and natural children.<sup>34</sup>

The national evaluation report of the 25th anniversary of Beijing states that in Chad - despite the commitment to reducing gender inequalities - "the great failures known are: (i) the non-adoption of a Code of Persons and the Family whose consequence is the difficulty of governing inheritance, matrimonial regimes and donations to allow women access to land, (ii) the persistence of harmful traditional and cultural practices that lead to violence against women and discrimination, (iii) the systematic non-application of the Parity Act. »<sup>35</sup>

### 6.1.3 Gender-specific data on gender equality gaps

The indicators known tell us about a high level of gender inequality in Chad, one of the most discriminating according to the Gender Inequality Index (GII). Chad has a GII of 0.710 which placed it 160th out of 162 countries in the 2019 index.<sup>36 37</sup>

The Gender Development Index (GDI), which ranks countries according to the absolute gender gap, places Chad with an IDG of 0.764 in Group 5 which includes countries where the level of gender equality is low with an absolute gender gap of more than 10%.<sup>38 39</sup>

These indicators indicate both discriminatory social institutions and deep inequalities between women and men, particularly in terms of access to education, opportunities for economic integration and political participation.

#### HEALTH

Maternal and reproductive health is a major issue: while the fertility rate of Chadian women has decreased over the past decade, it remains among the highest in the world: 5.6 children per woman on average, in 2020.<sup>40</sup>

Also, the adolescent fertility rate has been declining since 2008, but remains high: 161.1. That's more than 160 births per 1000 girls and women aged 15 to 19.

A maternal mortality rate of 1140, this rate places Chad as one of the 3 countries that exceed 1000 deaths per 100,000 pregnancies. The factors involved in this very high mortality rate are extreme youth, concomitant diseases (malaria or AIDS), anaemia or malnutrition, genital mutilation and economic and social factors such as poverty, poor access to care, and women's low decision-making power. The existence or absence of conflicts in the countries concerned also comes into play.<sup>41</sup>

<sup>34</sup> Colette Benoudji & Virginie Le Masson, Social norms, texts and practices: their influence on gender (in)equality and rights women in resilient development. Oxfam final report. Chad 2021.

<sup>35</sup> National Evaluation Report on the 25 Years of Implementation of the Beijing Declaration and Platform for Action, item No. 77, p.20.

<sup>36</sup> Country information note on the Human Development Report 2020 Chad.

<sup>37</sup> The Gender Inequality Index (GII) highlights gender-based inequalities in three dimensions: reproductive health, empowerment and economic activity.

<sup>38</sup> The Gender Development Index (GDI), based on the Human Development Index, is disaggregated by sex and measures gender inequalities in three fundamental dimensions of human development: health, control of economic resources.

<sup>39</sup> The Gender Development Index (GDI), based on the Human Development Index, is disaggregated by sex and measures gender inequalities in three fundamental dimensions of human development: health, control of economic resources

<sup>40</sup> <https://donnees.banquemondiale.org/indicateur/SP.DYN.TFRT.IN?locations=TD>

<sup>41</sup> Alexandra DiOrio1 & Dr. Andrea Crivelli-Kovach, The Global and Local Factors Influencing Maternal Mortality Ratios: Barriers and Recommendations for Success. In: Journal of Social Science for Policy Implications September 2014, Vol. 2, No. 3, pp. 33-60

### Female genital mutilation (FGM)

Although the law 006 of 2002 on reproductive health which condemns all forms of violence against women including Female Genital Mutilation. According to the MICS6-Chad survey, 2019, more than three out of 10 women between the ages of 15 and 49 have undergone FGM<sup>42</sup>.

### Child marriage

30% of Chadian women aged 20 to 24 were married before the age of 15.<sup>43</sup>

According to the 2014 and 2015 EDS-MICS surveys, about 3 in 10 women, or 29.9%, have been victims of physical violence at any time since the age of 15, 66.7% of them by their husbands or partners.

70% of women aged 15-49 in N'Djamena think it is justified for a man to beat his wife in at least one of the following situations: when the woman burns food, when she argues with him, when she goes out without telling him, when she neglects the children and when she refuses to have sex with him. 54% of men justify the use of spousal violence for at least one of the reasons cited.

### EDUCATION

The literacy rate is estimated among those over 15 years of age at 40.7% for men and 22.4% for women in 2016. The<sup>44</sup>proportion of uneducated women 62% was significantly higher than that of men 36%.<sup>45</sup>

The number of women and men who have at least started secondary education: 1.7% of women and 10.5% of men. In comparison for sub-Saharan Africa: 28.8 for women and 39.8 for men<sup>46</sup>.

The average duration of schooling 1.3 years for women and 3.8 for men<sup>47</sup>.

### USE, REMUNERATION AND USE OF RESOURCES

According to the 2014 and 2015 EDS-MICS surveys, 53% of women aged 15-49 in unions and 99% of men (99%) worked in the 12 months preceding the survey. 57% of women were paid only in cash compared to only 36% of men.<sup>48</sup>

71% of women, in union and who have been paid in money, decide on the use of the money they earn alone, 12% jointly with their husband or partner, 15% say that it is the spouse alone who decides on the use of their earnings.

In almost the majority of cases (82%), it is the man who decides on the use of his own earnings. In 14% of cases, the decision is made jointly with his wife.

## 6.2 Gender and vulnerability to climate change

### 6.2.1 Our methodological approach

In order to assess women's vulnerability to climate change events in N'Djamena, we start by defining the factors that determine their vulnerability. These factors have an impact on women's sensitivity and adaptability, elements of vulnerability.

According to the IPCC, vulnerability is the propensity or predisposition to be negatively affected. Vulnerability includes a variety of concepts and elements including sensitivity or susceptibility to harm and lack of adaptive capacity (IPCC, 2014). Sensitivity is the condition of predisposition of the inherent attributes of a system, referring to a cultural, political and socio-economic dimension that allows people

<sup>42</sup> MICS6-Chad, 2019, p.366.

<sup>43</sup> <https://www.td.undp.org/content/chad/fr/home/gender-equality.html>

<sup>44</sup> UNESCO/<http://uis.unesco.org/fr/country/td> data

<sup>45</sup> MICS6-Chad, 2015.

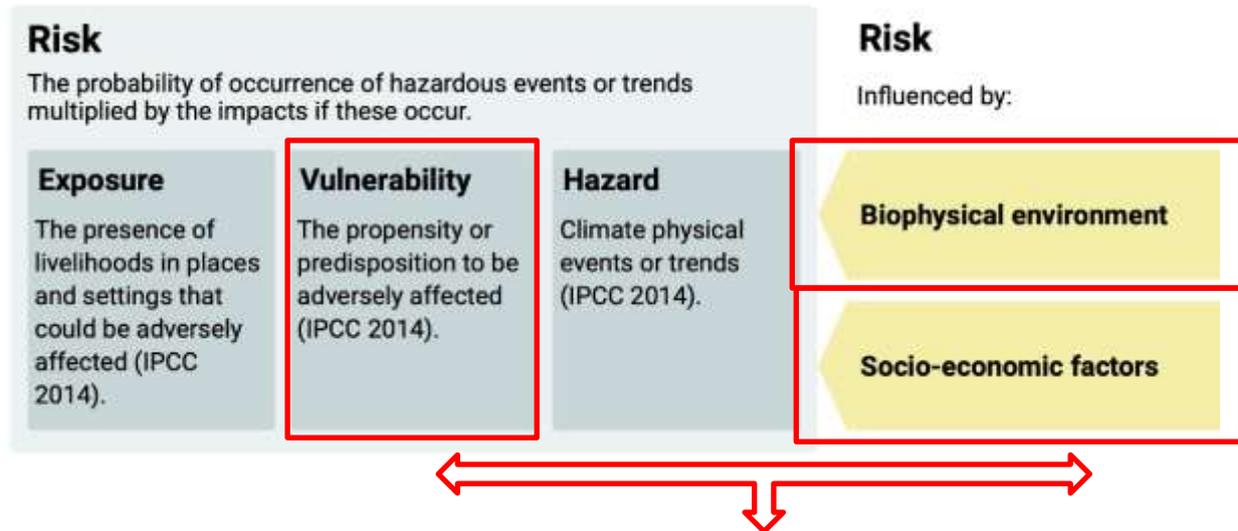
<sup>46</sup> UNDP. Information note for of countries on the Human Development Report 2020 Chad.

<sup>47</sup> UNDP: country briefing note on the Human Development Report 2020 Chad.

<sup>48</sup> Demographic and Health Survey and Multiple Indicators (EDS-MICS 2014-2015). Rockville, Maryland, USA: INSEED, MSP and ICF International

to cope with stress (Cutter et al, 2009; Shepard et al, 2012). Adaptive capacity represents the ability of a system to adjust to a disruption to moderate potential damage, exploit opportunities, or cope with consequences (Gallopin 2006, IPCC 2014).<sup>49</sup>

The degree of vulnerability of a community increases or reduces the risks in the face of a climatic hazard. To study the vulnerability of a specific community, especially women, to climate change, it is important to look at multiple factors that characterize this vulnerability. It is on the study of these different factors that we focused in order to understand the vulnerability of women to climate change in N'Djamena and more particularly in the face of flood risk.



Identification of factors particularly related to women's vulnerability: human capital, economic capital, social capital, access and availability and also the exclusion of women from the decision-making process.

Figure 2: Correlation between risk and exposure, vulnerability and extreme events (Adaptation G8)

Source: IPCC, 2014

The gender analysis grid used in this survey is based on the IPCC's analytical framework. The categories we established to group gender gaps also address USAID-defined areas of empowerment associated with women's vulnerability to climate change.

Human capital	Literacy, education, life skills, access to information, health status and nutrition.
Production	This category refers to income, time use, the distribution of time between productive and domestic tasks and care tasks. <sup>50</sup>
Resources	This dimension concerns ownership, access and decision-making power regarding productive resources such as land, livestock,

<sup>49</sup> IPCC, 2014: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Appendices - Glossary: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change

<sup>50</sup> Women's contributions to their families, communities and societies are often not part of the formal economy and do not reflect monetary value. This type of work, generally described as 'care work', includes the care of community members, natural property or future generations. Genanet 2013).

		agricultural equipment, consumer durables and credit and the diversification of livelihoods.
Decision-making participation	and	This dimension concerns leadership in the community, measured here by belonging to economic or social groups and public speaking.
Violence specific to women and urban spaces		This category refers to the planning of urban spaces and the place of women in the city as well as the circumstances that influence their safety.

This framework makes it possible to investigate the social situation and provide elements of understanding on the status, roles and responsibilities of women and men and on gender gaps. The data provided allows us to identify gender gaps and vulnerabilities that could be magnified in the face of climate hazards.

## 6.2.2 Human capital

This dimension concerns literacy and life skills levels, as well as access to information, nutrition and health status. This information is necessary to assess women's specific vulnerability as it determines both sensitivity and adaptive capacity to climate hazards. For example, the literacy rate is central because being able to read allows women to learn about the weather conditions as heavy rains approach, but also about the precautions to take during pregnancy (essential hydration during heat waves).

### 6.2.2.1 Education

At the national level, the literacy rate is estimated among those over 15 years of age at 40.7% for men and 22.4% for women in 2016. The proportion of uneducated women 62% was significantly higher than that of men 36%.<sup>51</sup>

Illiteracy rate of girls aged 15 to 24 of 77%, this rate is 86% for women over 15 years (3.3 million) and 70% among young people, representing (more than 2 million young people).<sup>52</sup>

The percentage of women and men who have at least started secondary education is also indicative of the gender difference: 1.7% for women and 10.5% for men. The average length of schooling is 1.3 years for women and 3.8 years for men.

#### **Main vulnerability identified: low level of education and training**

Climate change and associated natural disasters Put pressure on the natural and financial resources on which women are particularly dependent, and this pressure is all the greater after a natural disaster. Finding basic necessities and a source of income is has top priority for women and girls who must ensure the survival of the family at the expense of time spent at school. This situation therefore increases inequalities in terms of time devoted to education for women.

Education is an essential link in women's adaptation because it provides access to information to prevent risk and to knowledge other than traditional knowledge, while combating poor adaptation.

<sup>51</sup> MICS6-Chad, 2015.

<sup>52</sup> National Evaluation Report on the 25 Years of Implementation of the Beijing Declaration and Platform for Action, item No. 45, p.15.

### 6.2.2.2 Health

According to the literature and national data, women are more vulnerable than men because of their specific hygiene needs (due to menstruation and the care tasks assigned to them).

- ▶ Increased susceptibility to diseases (diarrhea, malaria), especially among pregnant women and children.
- ▶ Increased incidence of mortality and morbidity among women and children.
- ▶ Decisions about women's health care are determined by men.
- ▶ Specific gender-related health risks (especially during pregnancy or childbirth before, during or after the event)
- ▶ Maternal mortality: 1,140 maternal deaths per 100,000.
- ▶ Women are more likely to contract diseases during gestation (pregnancy and lactation).

Maternal and reproductive health is a major issue for women. While the fertility rate of Chadian women has declined over the past decade, it remains among the highest in the world: 5.6 children per woman on average, in 2020.<sup>53</sup>

While the adolescent fertility rate has been declining since 2008, it is still high with more than 160 births per 1,000 girls and women aged 15 to 19.

A maternal mortality rate places Chad as one of the 3 countries that exceed 1000 deaths per 100,000 pregnancies, it is 1140 maternal deaths per 100,000 pregnancies. The factors involved in this very high mortality rate are extreme youth, concomitant diseases (malaria or AIDS), anemia or malnutrition, genital mutilation and economic and social factors such as poverty, poor access to care, and women's low decision-making power. The existence or absence of conflicts in the countries concerned also comes into play.<sup>54</sup>

Pregnant women will be more likely to suffer from malnutrition or dehydration in times of flooding or severe heat. This combined with the long distances that women have to travel on a daily basis can put at risk their health and their lives. In addition, in a context of climate change, gender barriers to accessing care or to supporters are exacerbated and have physical impacts, psychic and important emotional<sup>55</sup>.

**Main vulnerability identified: a state of health (physical and mental) sensitive to climate change (diseases, injuries, depression, etc.)**

Women have greater needs than men in terms of hygiene (menstruation, pregnancy) and a greater susceptibility to diseases when these conditions are not met. Increased flooding will compromise access to health facilities is compromised and the risks of contamination/injury increase as they are responsible for natural resources and travel lengthens after a disaster to ensure household survival. The workload that weighs on them can then cause greater physical and psychological risks.

It is also important to mention pregnant women and women with young children who have limited mobility capacities and a more fragile state of health.

### 6.2.2.3 Access to information

There is no information available on the rate of equipping women/men with mobile phones but site visits showed that there were very few sources of weather information and no early warning system. This leads to a lack of anticipation for the protection and shelter of children, and goods (papers, clothes, belongings, small animals, etc.) in the event of flooding or other severe weather events.

53 <https://donnees.banquemondiale.org/indicateur/SP.DYN.TFRT.IN?locations=TD>

54 Alexandra DiOrio1 & Dr. Andrea Crivelli-Kovach, The Global and Local Factors Influencing Maternal Mortality Ratios: Barriers and Recommendations for Success. In: Journal of Social Science for Policy Implications September 2014, Vol. 2, No. 3, pp. 33-60

55 GIZ (2021), Diving into the Gap: Gender dimensions of Climate Risk Management

However, the literacy rate of women represents a general limit to access to information. This has a particular impact on women as they are in charge of monitoring and protecting children and household property.

There are a difficulty access to weather information and alert messages Generalized for the men and the wives, who do not have regular access to radio, for example. The literacy rate (cf the evaluation of the vulnerability related to education) is therefore the main discriminating factor for access some women in information.

**Key vulnerability identified: poor access to weather reports and alert messages**

Women are more easily cut off from communication channels that limit their ability to adapt. Their lack of access to education is also a major obstacle.

### 6.2.3 Production

In most developing countries, women are a particularly vulnerable group due to limited access, control and ownership of resources, unequal participation in decision-making and policy-making, lower incomes and levels of formal education, and an extraordinarily high workload. This economic and social burden on women includes, among other things, taking care of the household, caring for children and generating and managing household income.

#### Sexual division of labour in family activities

This category refers to income, time use, the distribution of time between productive and domestic tasks and care tasks<sup>56</sup>.

In Chad and in the survey areas, the activities of women and men in the reproductive sphere are highly codified. Each task is defined as a female or male activity. This distribution also affects children, although at their level it is less rigid<sup>57</sup>.

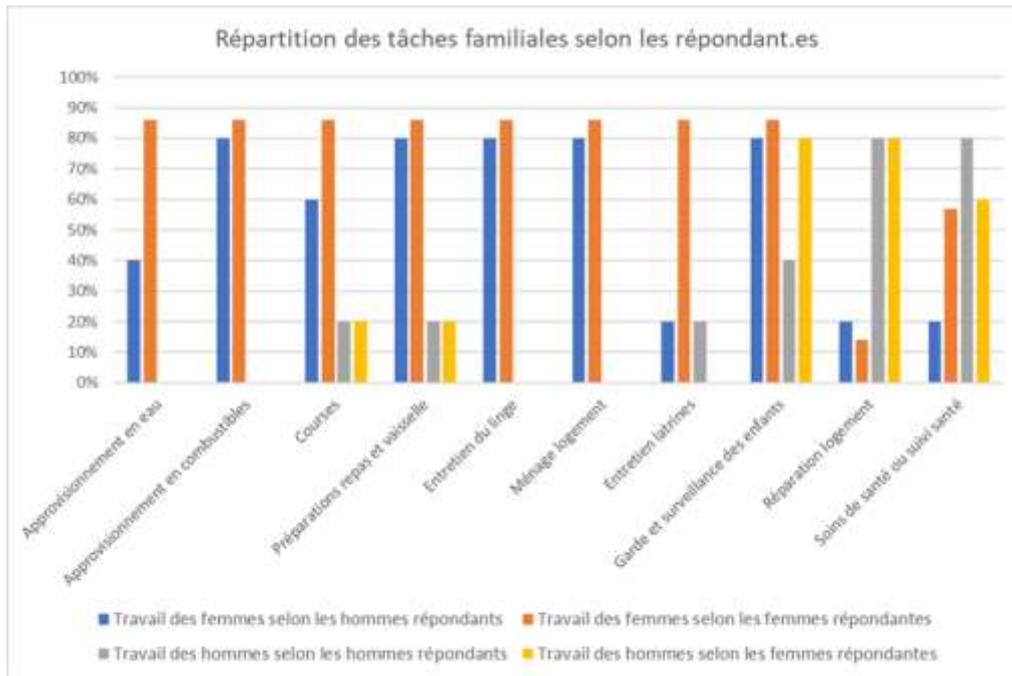
The sexual division of labour, as it appears in the survey areas, is presented as fixed or even immutable. Men and women agree, at the family level, on this distribution of burdens, which is described as self-evident.

We can note, in the graph below, that men and women agree on the differential attachment of task categories. <sup>58</sup>Women have a responsibility to cultivate, cook, collect clean water and care for children.

<sup>56</sup> Women's contributions to their families, communities and societies are often not part of the formal economy and do not reflect monetary value. This type of work, generally described as 'care work', includes the care of community members, natural property or future generations. Genanet 2013).

<sup>57</sup> As a reminder, the data come from the analyses that were made from the various collection exercises (interviews, observations, focus groups, participatory surveys). When relevant to understanding the origin of data and citations is Specified.

<sup>58</sup> Diagram based on household interviews n=7 women and 5 men.



Men are primarily responsible for providing livelihoods, but they also perform specific tasks within the household. They have an important participation in the field of housing maintenance and repairs, in the health care and follow-up sector, which is often carried by women<sup>59</sup>.

Conversely, there is a total absence of men in the tasks of collection (water and fuel) and maintenance (linen and cleaning), a small contribution in shopping, meal preparation and dishes.

This graph also shows that women overestimate men's participation in the care and supervision of children, which we will see later that this is an area that tends to evolve with children increasingly left to fend for themselves. In contrast, women underestimate men's participation in health care.

For men, with the exception of housing repairs, the tendency is to underestimate women's participation, in comparison with what women express, in 9 out of 10 items. In fact, men tend to reduce women's ownership of activities and spread them more to other family members, including children and other women in the family (mother and sister).

With regard to the distribution of tasks in the family, social norms also apply to children. Girls are expected to conform to standards and help their mothers with domestic chores. Nevertheless, boys participate in many tasks: collecting water and fuel, shopping, laundry maintenance, more rarely in the household, preparing meals and dishes.

In the survey areas, and especially in the 9th and 7th arrondissements, the absence of public services: social centers, health centers, kindergartens, and the operation of schools, questioned in times of flooding, does not allow the slightest reduction in the burden and responsibility of women around care and care.<sup>60</sup>

What considerably burdens women's working day are also all the tasks around the preparation of meals: difficulties of access to water, fuels for cooking, the market for the supply of food, utensils and high-performance cooking equipment.

Dependence on natural resources and travel for water and fuel collection involves significant working time and fatigue for women, girls and children. Effects that could be mitigated by proximity access to facilities or fuel supply. Having access to a water point in the dealership and having gas can reduce

59 Is it because of the heavy expenses that diseases can entail that this burden is under the control and responsibility of men?

60 The new structure of the provincial delegation for women, early childhood protection and national solidarity for the municipality of N'Djamena, provides for the revitalization of the practical activities of social centers, including a component of the child protection and development chapter plans to initiate and ensure follow-up programs early childhood supervision. Notes from Mbaïhomem Nodjindo Séverin, Head of Resources.

working time and fatigue related to transport. It is not uncommon to find within households several types of fuel, most often gas and wood/charcoal<sup>61,62</sup>.

Here are the conclusions of our on-site study:

- ▶ Total absence of men in collection tasks (water and fuel).
- girls are expected to conform to standards and help their mothers with domestic chores.
- ▶ Women have a responsibility to care for family members, but children are increasingly left unattended.
- Men play an important role in the health-related decisions of all family members.
- ▶ Men minimize women's participation in tasks Housewives.

**Main vulnerability identified: increase in workload (productive, home, child management) mainly related to lack of access to resources and basic necessities (water, energy, food, etc.)**

Women are regularly responsible for supply and care activities. Climate change is therefore likely to increase their burden by increasing pressure on natural resources. Indeed, it will increase the workload and travel time of women and girls to fetch water, food and heating wood.

### Sexual division of labour in livelihood-generating activities

Traditionally, men were in charge of income-generating activities, but women's work has become central to household survival. Women are mainly involved in agriculture and small informal business activities, two activities that can be strongly impacted by climate change.

The survey areas show differences in employment and socio-professional categories for the population covered by the survey.

In the 9th arrondissement the population, men and women is still very involved in agricultural production and market gardening activities, it also practices the small trade of resale of basic products. For women, activities are mainly carried out in the informal sector.

In the 7th and 4th, the population, men and women, holds jobs in the tertiary sector: commerce, administration, transport, financial activities, services, administrations. Women's trade activities are mainly in the informal sector.

The women interviewed in the in-depth interviews (households) and in the focus groups work in the informal sector, either, as already specified, in the market gardening (9th) and vegetable sales sector or in the resale trade (all districts).

The poor livelihoods of the people of Walia are glaring. It is described by women in focus groups and workshops around exploratory walking. In this district, problems related to food supply are described as recurrent and aggravated in particular according to climatic hazards (floods, heavy rains and high heat).

These problems of food poverty are reported by the WB which indicates that there is greater income inequality in urban areas than in rural areas.<sup>63</sup>

In the survey areas, women stress that for them, carrying out income-generating activities are essential to supplement the husband's financial contributions and to ensure in the first place the provision of food to the family. They point out that increasingly, men tend to no longer provide the sums of money needed for daily expenses and that they increasingly rely on women's contributions. After a disaster where the financial needs are greater to "rebuild", this situation puts an additional strain on them. It is therefore no longer just a question of women seeking a supplement but of participating fully in the provision of livelihoods.

The ICRC factsheet 2021 confirms the effects felt and described by the groups met "one of the main effects of climate change in Chad is food insecurity. 38.4% of the population is below the international

61 The rapid survey did not make it possible to precisely define the time spent on these tasks, the clocks made during the interviews are too inaccurate to deliver this information. Only the recurrent testimonies of women about the time spent and the fatigue related to these chores show that access to water and fuel are central problems for them.

62 5 of the 7 households used gas, some on an ad hoc basis depending on economic availability.

63 World Bank "Reduce gender inequalities in Mali, Chad, Niger and Guinea", 2018, p.63 (MICS 2011 figures).

poverty line, and the whole country is classified by the World Health Organization (WHO) as a "low-income country with a food deficit" (...). Recently, food insecurity figures have increased, as severe insect and pest invasions as well as floods have destroyed agricultural production leading to widespread and severe food insecurity, with long-term health implications. ...). These risks are expected to intensify and become more frequent as a result of climate change. »<sup>64</sup>

This reality appears to be shared in the 7th and 9th arrondissements where household income levels are average and low. We understand that the question of employment, access to income-generating activities is important.

The trade option is often the first resort for women who will develop their business. The family workload requires a flexible and compatible activity and even if in this sector the competition is huge and does not guarantee high earnings, it remains the sector preferred by women.

In the context of climate change "In most Chadian communities, households are supplied with water, fuel and food by women. As a result, the latter are particularly impacted in situations of food shortages, fuel scarcity and distance from drinking water supplies »<sup>65</sup>. This observation is in line with those made

#### **Key vulnerabilities identified: significant dependence on the agricultural sector**

Women are particularly present in the agricultural sector, which provides additional income to the household. In the event that a flood or drought impacts agricultural activities, their financial resources would be directly impacted.

during the investigation. Women bear a disproportionate burden on harvesting the water and fuel needed for daily survival. This extra load increases their working time. The following category explains the impacts on women's vulnerability due to these disproportionate burdens.

### 6.2.3.1 Gender and working time

None of the men's clocks mention domestic tasks. Men's days are organized around salaried work, craft or market gardening activities. On average, the men in the sample work 8 to 9 hours a day, or 48-54 hours over 6 days.<sup>66</sup>

- ▶ Rising between 4 and 5 a.m. (4 a.m. for those who pray), men begin their productive activities around 4-5 a.m. for those who have a garden and at 8 a.m. for others. Between 4-5h and 6h they are in the garden and from 6-7h to 11h they go to the market to sell their production.
- ▶ Between 11am and 3-4pm rest then return to the garden until 6pm.
- ▶ For those who have a job, they work there from 8am to 4-5pm
- ▶ In the evening from 4-6 p.m. until 7 p.m., they see friends, watch football matches, television, before going to sleep between 8 p.m. and 10 p.m.

In comparison with the workload of men, the workload of women, in the contexts of the survey can be described as heavy, it is included in a range of 13h to 16h per day for all activities (productive and reproductive) combined. If we make a projection from these schedules we obtain for a week of 6 days an average of 90 and 96 hours per week for those who carry out activities outside the household and 78 hours for those who do not work outside.<sup>67,68</sup>

- ▶ Rising between 4 and 5 a.m. (4 a.m. for those who pray), women begin their domestic activities around 5 a.m. Between 5am and 8am or 9am they take care of cleaning the yard, providing water and fuel, caring for the children, preparing breakfast and other meals, washing dishes
- ▶ Those who have an income-generating activity (market gardening or sales) leave the home from 8am and work until 4-5pm.

<sup>64</sup> ICRC, Climate Centre, Country level, climate fact sheet, 2021.

<sup>65</sup> Ibid. p 55.

<sup>66</sup> This typical day was drawn up from 4 time clocks made during the household interviews, one of the 5 men was retired his clock was not taken into account. The 4 men were 2 market gardeners, 1 civil servant and 1 mechanic.

<sup>67</sup> This typical day was drawn up, based on the 7 time clocks carried out during the household interviews, and checked for validation during an in-depth interview with a young woman, geographer and market gardener living in Walia.

<sup>68</sup> As noted above, there are no accurate comparative data on the hours of work of women and men. In 2011, FAO claimed that in Africa women worked 2/3 of the hours worked, which corresponds to the results of our sample. In « Communicating gender for rural development, Project Dimitra FAO, 2011.

For those who do not work outside the house between 9am and 3-4pm they go to the market, cook, maintain the home, wash the laundry, take care of the children.

- ▶ It is between 3 p.m. and 5 p.m. that women, all productive statuses combined, meet with other women in groups, tontine, prayer group, or neighborhood.

From 5 to 8 p.m. they resume the tasks of water and fuel supply, child care (toilet), meal preparation, dishes, etc.

- ▶ Between 20-21h and 22-23h, they take a relaxing time with their children or neighbors, before bedtime.

Given the high number of children per woman, the issue of their supervision is at the heart of the problem. During the survey we were able to note that the space in the concessions is shared, sometimes with other adults (grandparents, uncles and aunts), which makes it possible to find punctual help, in particular for the care of children, the care of the elderly and the supervision of property. Nevertheless, several testimonies mentioned that the economic constraints on women make it difficult to compromise between the obligation to work outside the world and the need for supervision of children. A trend seems to be emerging to leave children more and more to their own devices. The use of domestic children is also mentioned as domestic help but without specifying the extent of this type of practice.<sup>69</sup>

What characterizes the role of women, compared to that of men, is that they have to take on productive and family tasks throughout the day, often simultaneously. It is important to support their productive activities, but above all to reduce women's domestic work.

## 6.2.4 Resources

This dimension concerns ownership, access and decision-making power regarding productive resources such as land, livestock, agricultural equipment, consumer durables and credit and the diversification of livelihoods.

### 6.2.4.1 Goods

Women are over-represented in urban agriculture, however, as climate change results in the loss of arable land and soil fertility for market gardening (floods, soil leaching and landslides). Field surveys have shown that food and vegetable production in the Walia area is essential to the household economy and that women are responsible for providing food in the household. Women sell part of their production in local markets or use it for self-consumption. The main problem that women repeatedly mention is famine due to lack of food and inability to provide food during floods.

Regarding access to land by women, it was not possible to obtain data. Land that has been handed over within the framework of the Commission for Land Allocations in Urban Areas (CATZU)<sup>70</sup>, including Walia, were to the head of household. No data on land allocations to women heads of household, or on

<sup>69</sup> They are children entrusted by poor parents or acquaintances. These children placed in families are supposed to receive education and care, but in reality they are employed from night to morning as domestic servants, often malnourished they are also victims of violence.

<sup>70</sup> The Commission for Land Allocations in Urban Areas (CATZU) has been charged from: (a) Centralize, analyse and process all land applications in urban residential and industrial areas; (b) Establish the list of successful tenderers; (c) Transmit the list of successful tenderers to the Directorate in charge of the Cadastre for competence; (d) Verify that the successful tenderers have fulfilled their obligations within the required time limits. Order in Council 08-1312 2008-10-23 PR/PM/MATUH

women's inheritance guarantees of land surrendered, in the event of the death of the spouse, are

#### Access, use and control of land

Many women live in rural or peri-urban areas, have access to land and cultivate it. However, they do not have assured control over the land and its products. Rarely owners, women are disadvantaged in terms of inheritance. It is not women's access to land that is the problem, but the lack of control and property rights.

Chad's land tenure consists of an overlap of legal spheres. Different norms, rules and sanctions combine. While official laws (Transition Charter in its Articles 7 and 8, Law 12 of 2018, etc.) generally give women the same rights as men, these laws are not applied consistently because customary law has a major influence on women's access to land.

On a practical level, this overlapping of rights exposes many women to great insecurity and places them in a very precarious situation. They risk losing the land they cultivate when their husbands die, or if men in their families or communities decide to sell the land. Women are particularly threatened by rising land prices, land scarcity and increased competition for control of this resource.

Information provided by Celiaf

available.

Finally, it is important to point out that women are responsible for the goods inside the house, which can be greatly damaged, destroyed or lost during a flood. The issue of administrative papers is also important because without paper it is difficult to initiate procedures, to access services and the question of their renewal places a significant burden on women.

#### **Key vulnerabilities identified: Key vulnerabilities identified:**

##### **Larger financial resources**

Because of their heavy reliance on flood-affected activities, women have fewer financial resources to ensure household survival.

##### **Loss and damage of property under their responsibilities** (administrative papers, house ...)

The protection of women's property, including administrative documentation, is essential to avoid a heavy mental burden and facilitate access to services.

#### 6.2.4.2 Services

If some neighborhoods have public and private health services, schools, police office or other security service. Most have a glaring lack of services. Remoteness and the lack of public services add burdens to women's work by forcing them to travel more to access them.

We have seen a lack of access to basic urban services, including access to clean water, decent sanitation, health services and educational facilities, which accentuates the precariousness of land tenure and the social fragility of the city.

Heavy floods have dramatic human and economic consequences (material damage, slowdown in economic activities, etc.). which are exacerbated by the lack of adequate public infrastructure.

It is the lack of development of markets, which is the problem most often put forward by women and then that of the absence of police (police office or community police), this in all neighborhoods.

There are some public fountains but no latrine accessible to women, except for the millet market. Green spaces, leisure, sports and relaxation areas are non-existent.

With regard to women's access to credit in the survey areas, the problems are linked on the one hand to the lack of micro-credit proposals and on the other hand to the very high and variable rates charged by lending merchants. This lack explains the use of tontines by the majority of women.<sup>71</sup>

According to the ECOSIT 3 survey, women's lack of access to financial services is explained by their lack of knowledge of the existence of credit institutions, their poor access to and/or control over resources and their low decision-making power at the family level. The results of the survey show that only 5% of women have a bank account that they manage themselves; whereas 11.8% have access to credit; and that only 19.7% know where they can get credit.<sup>72</sup>

Moreover, this limited access to credit prevents them from investing in more sustainable businesses, or from adapting more flexibly to climate change. In addition, in the survey areas, especially in the 9th and 7th arrondissements, the lack of public services such as social centres, health centres, kindergartens and schools, or their malfunction during floods, increases the burden and responsibility of women in terms of care and treatment.

#### **Main vulnerability identified:**

##### **Lack of access to main services (health, sanitation, schools, waste treatment site etc.)**

Lack of access/closure of health centres, schools, waste disposal sites, etc. during extreme weather events implies an increased burden on women as caregivers, and increased risks for pregnant women who are more vulnerable.

##### **Limited access to credit**

Their limited access to credit also prevents them from investing in more sustainable businesses to adapt to climate change and recover from disaster.

## 6.2.5 Decision-making and participation

This dimension corresponds to women's participation and decision-making power in the community and in the household. In both spheres, Chadian women found themselves marginalized because of power relations, the distribution of roles and the cultural context (religion, composition of participatory spaces, etc.). Although women play a central but disproportionate role in maintaining livelihoods and the environment, there is little evidence that specific adaptation efforts, policies, funding and institutions target them (Mitchell et al., 2007). This limited participation increases their vulnerability because the measures taken to address climate risks do not take into account their specific needs.

Similarly, decision-making power is important in terms of women's empowerment. According to information gathered on the ground, women do not have a limited public and private voice. Empowerment in decision-making builds adaptive capacity and better manages the effects of climate disasters.

### 6.2.5.1 Decision-making power

With the exception of female-headed households, which, for reasons of widowhood or divorce, are obliged to assume the role of family manager, the heads of household are exclusively men.<sup>73</sup>

In Chadian society and in the households met, men are considered to be responsible for the home and to bear a heavy responsibility: that of providing for the material and subsistence needs of the family. This position goes hand in hand with the recognition of their power and decision-making role within the household, in the community, in civil society organizations and political bodies. Nevertheless, in the

71 Information verified in household interviews, FG women and in-depth interviews.

72 FAO " National Gender Profile of the Agriculture and Rural Development Sectors, CHAD, 2018. P.52.

73 In the Family Code, the husband is designated as the head of household. The draft of the new Code on Persons and the Family aroused resistance, and its adoption and promulgation had been awaited since the transmission of its first version to the Government in February 2000 by the national commission responsible for its elaboration. In National Gender Profile of the Agriculture and Rural Development Sectors Republic of Chad 2021, FAO.

context of the survey, it can be noted that the social norms that put men in a position of power in the family do not prevent women from having a certain capacity for decision and action in several fields of intervention within the household.

Access to decisions and control in the family sphere depends on activities and goes hand in hand with the sexual division of labour. Thus, women are decision-makers on food issues and on their own productive activities. Men decide and control issues related to housing, access to health services, schooling and non-food purchases. In these areas, although women may, in some couples, be involved in decisions, it is the husband who remains the decision-maker.<sup>74</sup>

Regarding access to resources from their work, for those who live in couples, 4 out of 5 women say that they manage and decide alone the use of these resources, just as they decide alone, in the same proportions, the type of productive activities they want to carry out. This is also a trend that emerges from focus groups, there is sometimes a control of women's personal resources but this is not the general rule.<sup>7576</sup>

All men report managing their resources alone, and women confirm this fact.

#### **Main vulnerability identified: limited access to decision-making (personal and public sphere)**

Most hazard relief efforts are aimed at the entire population and often rely on existing resource distribution structures. This can become problematic when pre-existing structures reflect a patriarchal structure of society, as it can lead to the marginalization of women in their access to relief resources (PAHO 2002). Women are also marginalized in the planning and preparation of these events, which increases their vulnerability because their specific needs are not taken into account.<sup>1</sup>

## Community and organizational participation

This dimension concerns leadership in the community, measured here by belonging to economic or social groups and public speaking. The ability to assert one's interests at Community level is an important vector of adaptation to climate change. For example, if the entire neighbourhood deposits its waste near a house and this leads to flooding by blocking a drainage network, if the inhabitants concerned do not have access to local decision-making bodies, they will not be able to find collective solutions.

At the city level there is a Mayor and a Governor. Both work with borough mayors. The districts in N'Djamena are administered by Mayors. Mayors run wards that are administered by ward delegates. Some ward delegates are part of the City Council but others are not (we do not have the exact number).

All the delegates of the 7th and 9th arrondissement are men. The square chiefs who are the level below the delegates are 159 in number with 147 men square chiefs and 12 women. While delegates say they appreciate the work of women square chiefs, this fact is little reflected in the appointments since women are less than 8% to occupy this position.<sup>77</sup>

It should be remembered that community discussion spaces are in principle mixed spaces, from a gender point of view, and open to all. It should be noted, however, that in terms of community participation, while mature men have both the opportunity to access decision-making spaces and to take

74 These findings are in line with those made in the MICS 2015 survey (p.309) "Women are little involved in decision-making, especially those concerning their own health care, with men deciding mainly in 74% of cases. On the other hand, in 83% of cases, the man decides alone for his own health care"

75 The other two are widows and decide alone.

76 These figures are in line with those of the MICS 2015 survey (p. 309) which states that "Almost all women in unions and who have been paid in money for their work decide on the use of the money they earn, either alone (66% for N'Djamena) or jointly with their husband/partner (22% in N'Djamena).».

77 The FG with the delegates took place before the start of the surveys, the 4th arrondissement had not yet validated access to the area for the survey, which explains the absence of the delegates of the 4th arrondissement.

part in community decisions, this is not the case for either women or young men. These two groups can participate but their power of expression and decision is limited.

Young men point out the fact that, if the older ones are present, they cannot express themselves. Although they took the lead during the floods in the operations of water evacuation, reinforcement of dikes, protection of houses in the affected neighborhoods, they did not, however, acquire rights in terms of consultation and decision-making.

All, women and men testify to this leadership of young people "There is a collective solidarity of the young people of the neighborhood to drag the water to the canal" Whatever their involvement the power relations that operate between the age groups excluded the young people from the spaces of community decision-making. During a focus group bringing together men of all ages, a participant stressed "We must build the dikes well, because the valves are not built to the standard. It takes the participation of the population to guide before construction. We need alumni and specialists, not amateurs." This message is a reminder of what participation means and how this right is linked to a set of inseparable conditions: knowing, speaking and deciding.<sup>78</sup>

For women, the same is true, their participation in mixed community activities, i.e. outside women's self-help associations, is an indicator of power relations. Although they are sometimes called upon to mobilize in community exercises, and in particular during collective work, their capacity for expression and decision-making is as limited as that of young people.

The exclusion of women from decision-making processes at Community level is the rule. It was pointed out during the exchanges with the group of organized women. If they are invited to meetings, they do not have a say "The woman does not have the floor, she only listens" "the woman has no value". The pretexts mentioned, which they say support this lack of consultation, come from social norms that define very precisely where the place of women is. Moreover, the fact that the vast majority of them are illiterate, therefore considered "simple", reinforces the idea, among both women and men, of an inability to express themselves due to a lack of knowledge.<sup>79</sup>

This absence of the right of expression also falls within the scope of accepted norms of propriety. Thus, women can not speak in front of men, for Muslim women it is a matter of correction "no women can not express themselves and give their opinion, it is normal" "A well-educated woman does not speak in front of men", "A woman must know how to be silent", these widely disseminated precepts are all reminders to order addressed to girls and women. "For me everyone does what is supposed to be done to live together (...) the woman can attend the meetings but it is a lack of respect if she speaks"<sup>80</sup><sup>81</sup>

For educated young women, as for young men, their ability to think is not a guarantee of participation. "If a young intellectual woman speaks, she can be heard but everyone thinks she is taking the big back."<sup>83</sup>

Most women participate in associations, groups, tontines or in groups of religious practice. No woman spontaneously presents herself as a leader, even in organized women's focus groups, although it is easy to identify those who speak without difficulty and are listened to by the group, in general they are women over 50 years old. As for young men, age is a criterion for access to the right of expression and decision. Of the women interviewed during the interviews, only one presented herself as a leader in her neighbourhood, a woman over 50 years old, alone and head of household who, as a result, has all her autonomy. She testifies to having participated in mixed groups, but 3 years ago she created a group of women because "With men there are always problems, between women we are more united".<sup>84</sup>

The question of the empowerment of women and young people arises at both the individual and collective levels. Young girls and boys testify to their aspirations for greater autonomy that can enable them to make their own choices in life. Access to knowledge (school, study) and for the most disadvantaged women to literacy seem to be important elements for the acquisition of a certain power

78 FG Men Antoukoui

79 FG Women Quotes Antoukoui, WaliaMarket Senague.

80 Interview woman Senegalese market.

81 FG Women Quotes Antoukoui, Walia.

82 Interview man Senegalese market

83 FG young women Walia.

84 Interview woman head of household Walia.

of expression in collective spaces. Although, as stated above, for the moment the most educated young women testify to the contrary.<sup>8586</sup>

At the collective level, young people, girls and boys, seek and demonstrate an aspiration to develop their capacity for influence in order to move towards change and towards a just and egalitarian society, especially in the relations between men and women.<sup>87</sup>

**Key vulnerability identified: limited access to community speaking spaces**

Community participation is highly controlled and prioritized, both by gender and age. Middle-aged men control and direct the spaces for discussion and decision-making from which women and young people are excluded.

As a result, women's voices are not heard and their needs cannot be taken into account even though their vulnerabilities to flood risk are high. As a result, they are also forgotten about the programs and policies to be put in place that would reduce their vulnerabilities.

## 6.2.6 Violence specific to women and urban spaces

This category refers to the vulnerabilities associated with urban spatial planning and the place of women in the city as well as the circumstances that influence their safety.

The data collected on GBV was made during 3 exploratory walks with 43 women and 4 delegates or representatives of the neighbourhoods.<sup>88</sup> To carry out these walks, the participants chose together to explore the most used paths on a daily basis to go to the market, carry out their economic activities, go to work, to the fields, to school, to public transport.

Identifying the problems allowed the three women's groups to observe and understand on the one hand what can generate insecurity and GBV and on the other hand to understand the impact of high heat, heavy rains and floods on the issues of traffic, insecurity, violence and GBV in public spaces.<sup>89</sup>

The surveys began with workshops of reflection and exchange on the violence and fears known and felt by the inhabitants of the neighborhoods, women and girls. The first remark that can be made is that there has been a concordance in the analyses made by all groups on the violence known and observed in the neighborhoods.

Theft and violence in the streets and markets that target women and especially shopkeepers are the first violence cited and on which women insist in the 3 neighborhoods. "There are a lot of thefts, before we left the business at the market and we paid a guard but with the insecurity, we were afraid that he would be killed. We preferred to release it and we sell at home"<sup>90</sup>

Street harassment and threats (verbal violence, insults, insults and provocations) as well as assaults (rape, sexual assault, harassment) are also denounced. This type of aggression mainly affects the youngest, according to all groups.

<sup>85</sup> FG of young girls and boys in the areas.

<sup>86</sup> FG Women Walia.

<sup>87</sup> Marche Workshops Walia, Senegalese district and Amtoukoui.

<sup>88</sup> Definition of GBV: Art.1 of Declaration on the Elimination of Violence against Women, resolution 48/104 of 20 December 1993 "For the purposes of this Declaration, the term 'violence against women' means all acts of violence directed against the female sex, which cause or may cause physical, sexual or psychological harm or suffering to women, including the threat of such acts, coercion or arbitrary deprivation of liberty, whether in public or private life"

Article 2-a, b, c "(a) Violence against women is understood to include, but is not limited to, the following forms of violence: Physical, sexual and psychological violence within the family, including beatings, sexual abuse of female children in the home, dowry-related violence, marital rape, genital mutilation and other traditional practices harmful to women, non-spousal violence, and violence related to exploitation; (b) Physical, sexual and psychological violence in the community, including rape, sexual abuse, sexual harassment and intimidation at work, in educational institutions and elsewhere, procuring and forced prostitution; (c) Physical, sexual and psychological violence perpetrated or tolerated by the State, wherever it occurs. »

<sup>89</sup> Here as in MICS 2019 questions about fear, such as feelings of security and perception of crime, indicate the perceived level of security in everyday life. These perceptions limit people's freedom of movement and influence how they will use spaces to limit threats to their safety.

<sup>90</sup> FG Women + 36 years Walia;

Finally, poverty and what it causes in particular as an effect on girls' education is denounced as violence "The majority of girls do not go to school because of poverty, the distance (to be travelled)." <sup>91</sup>

It can be concluded that if violence is increasing in urban areas, it is mainly against women. The increase in violence in times of health and environmental crisis also affects women and girls more in the same pattern. <sup>1</sup>

At the end of the year, the three groups made recommendations to improve the organization of spaces, accessibility, traffic, safety on the streets, access to public services on a daily basis, social cohesion in connection with the prevention of the consequences of floods, rainy episodes and high heat.

Despite the prevalence of domestic violence in Chad (more than a third of women aged 15-49 who are not single) this violence is not mentioned at the beginning or it is described as not affecting the neighborhood or the groups present in the workshops, "Domestic violence itself does not exist" <sup>92</sup>. It is by digging into the subject in the workshops of Marche that the languages are loosened. "In rainy periods there are men who are violent towards their young people and children as they are stressed by the lack of means to secure their families." <sup>93</sup>

This subject is confirmed by the men <sup>94</sup> "Oui the violence increases in this period (flood), madame puts pressure on the father to go get money, as in Chad in rainy season everything is blocked, this one in return hits the children"

Female genital mutilation, which is also very common, is not mentioned at all.

During the floods, women first denounce the increase in thefts and assaults, which can also affect men, with fears for their belongings when families are evacuated.

Insecurity during food distributions is mentioned in Walia where a good number of women have been beneficiaries of humanitarian aid. Several testimonies speak of the threats made by unaffected men who seek to recover food "Women suffer during the floods, they travel great distances in the water in shorts and underpants to reach the places of distribution of food and it is the non-victims who receive them. It's even harder for widows (single women)." <sup>95</sup>

The economic precariousness, induced by the floods, would have the effect of increasing the prostitution of women.

Finally, brutality and lack of police protection are also stated "If you don't have money to protect yourself and you can't pay, the police do nothing" "no police intervention in case of assault". Findings also relate to violence by organized groups of men who allegedly try to seize land with a view to marketing it. <sup>97</sup>

During rainy periods, women may also be forced to make long detours in their journeys for the supply of resources and for their income-generating activities. The lack of viable paths adds to the difficulty and danger of falling or being attacked when passing through unsafe areas. In N'Djamena, 14.8 per cent of women report having been robbed, compared with 6.6 per cent of men. According to field surveys, robberies and violence in the streets and markets, which target women and especially women traders,

### **Main vulnerability identified: an increased risk of gender-based violence**

Following a disaster, women and children are at higher risk of gender-based violence (GBV), human trafficking and sexual exploitation. While domestic violence remains the highest risk, more and more assaults by strangers are reported after a disaster, especially when women and girls are separated from family, friends and other protection networks (Bradshaw & Fordham 2015). Gender-based violence also makes women less resilient.

During the field survey, it was found that in many places, women are attacked when they go to do their business - because private and public latrines cannot be used during floods.

<sup>91</sup> Exploratory walk Amtoukoui.

<sup>92</sup> Walking workshop Amtoukoui

<sup>93</sup> Quotes Fg Femmes Market Senegalese

<sup>94</sup> Quotation Fg Hommes Marcé Senegalese

<sup>95</sup> During interviews household FG to Walia and Amtoukoui

<sup>96</sup> Quotation Fg Wives Amtoukoui.

<sup>97</sup> FG Women Walia

are the first types of violence mentioned and highlighted by women in the three districts.

### 6.2.6.1 Urban spaces

A high level of violence against women in public spaces has been noted in the field, more specifically against women who engage in street vending. The presence of ruined or abandoned houses, car wrecks, fenced and empty spaces or abandoned cultivated areas that present a worrying and risky environment for women and girls. Also, women who practice street vending are all the more vulnerable to the risk during periods of heavy rain or flooding.

In general, coping strategies in the face of fear in public spaces lead to the following behaviors:

- ▶ Do not go out before or after such time;
- ▶ Going out in a group;
- ▶ Anticipate your journey;
- ▶ Take safer paths and detours even if they are longer;
- ▶ Be accompanied by a man;
- ▶ Spend the night in the place where you are and return the next day;
- ▶ Limit girls' outings.

In the Senegalese neighborhood, young girls say they do not go out without hiding their small bags, phones and other precious objects in baskets or veils so as not to attract attention.

The vulnerability of women and girls, perceived as natural, leads to the implementation of a series of preventive measures, such as the control of girls' movement, which will further reinforce gender stereotypes. While these precautionary measures may appear to be fair and compliant, they only keep girls away from free and autonomous access to public spaces. Making cities safer, more accessible, improving their quality of life and social cohesion made it possible to bring women and girls to the exercise of their right to live, work and live freely in urban space and also to participate in the dynamics of the manufacture of a new urbanity.

The women's recommendations aim at a real urban development at the service of the populations. These recommendations indicate that improvements are needed to improve their traffic conditions, but that these investments alone will not be able to lead to real social and cultural changes that can lead to a reduction in insecurity and violence in public spaces.<sup>98</sup>

For these walking groups, investing, investing in changes favorable to the security, presence and movement of women requires cultural and social transformation actions through education, support for women's groups, employment, training of women and youth, etc. These aspects are at the heart of their recommendations.

The organization of work did not allow sufficient time for work to prioritize recommendations. These are therefore presented without specifying the priorities. Nevertheless, the most recurrent topics identified by the three groups of marches concerned the development of markets, the development of AGR, and the improvement of the development and maintenance of streets with the planting of trees and the creation of a community police truly invested.

**Main vulnerability identified: public spaces promoting insecurity (lack of light, fewer people on the streets...) Main vulnerability identified: public spaces promoting insecurity and exclusion (lack of light, fewer people in the streets, etc.)**

Public spaces in normal times do not take into account the insecurity of women reinforcing their exclusion from public spaces and their lack of autonomy in their movements. In times of flooding, the feeling of insecurity and aggression in public spaces are also more important.

<sup>98</sup> See in the annexes the list of recommendations made at the end of the marches in Annex 4.

## 6.3 Adaptive capabilities and opportunities

In addition to assessing women's vulnerability to climate change and in order to identify relevant, duplicable, sustainable adaptation measures with transformational scope, it is necessary to identify:

**The capacities and spontaneous adaptive strategies** put in place by women in crisis situations to overcome the lack of government planning and intervention. In this context, it will be a question of identifying the actions of poor adaptation that increase the situations of risk for women to better correct them.

- ▶ **The opportunities to be exploited**, on which adaptation actions could be based for greater effective integration with local communities.

### 6.3.1 Adaptive abilities and poor adaptation

As part of the fieldwork carried out, we have identified a number of actions, part of spontaneous adaptation strategies, put in place by women before, during and after the climate event. It is important to emphasize that these identified strategies are mainly reactive and refer to the ability to do so while adaptation is intended to be anticipatory and installed over time to profoundly modify the functioning of a system (community) and strengthen the adaptive capacities of populations in the face of a risk.

These actions help to weigh women's vulnerability to climate change and are considered an integral part of their adaptive capacity. They are mainly based on mutual aid and social ties within the community.

- ▶ Before the event
  - Purchase of essential products (oil, salt, soap) in very small quantities,
  - Production work source of income
  - Community works (construction of dikes)
  - Investment in community spaces
- ▶ After the event:
  - Appeal to informal credit (small loans to traders in the area, indebtedness to neighbors and family members).
  - Borrowing of goods from friends for resale (sale on the run) and revival of a small business,
  - Strong community mutual aid (women's group organized to participate in the collective work of repairing the dike in Walia and to build paths, or organizations by women's groups of waste collection, cleaning of schools and health centers (4th) and to seek support and humanitarian aid. )
  - Use of natural medicine for health
- ▶ Identified actions that may be subject to poor adaptation:
  - Use of various fuels for cooking (sometimes toxic: animal droppings, plastic cans);
  - Water purification through the use of filters (fabrics), bleach
  - Use of natural medicine for health

### 6.3.2 Opportunities identified

To propose adaptation actions that are effective, easily integrated and implemented by the populations, it is important to exploit the opportunities identified in the context of this field work.

- 1) An institutional mobilization with an increasingly important presence of women: a national and local (municipal) framework favorable to the implementation of adaptation actions in the face of climate change (National Communication on Climate Change, planning of drainage infrastructures ...) with women increasingly present in the political world (assembly, neighborhood community)

- 2) Building on the strength of the community: the women's community is based on social ties and a strong support system that supports the integration of adaptation measures
- 3) Promote empowerment: women within the community itself can inspire and carry the voice of women (older women, women present in institutions). They are essential supports for adapting to climate change and acting on women's adaptive capacity.
- 4) Taking advantage of public places where the presence of women is important to convey information : even if the schooling rate of young girls decreases over time, school can be considered a strong place of transmission as well as markets where women are very present.
  - ▶ Rely on women's strength and resilience and their current ability to make decisions (even if not valued in society), ensure the survival of the household and to care for others and be part of change.

We understand that not all proposed actions can be implemented. However, they are listed in order to be integrated as much as possible into the project activities as they respond to the conclusions of the analysis. Prioritized activities are presented in the presentation accompanying the study

## General conclusions on vulnerabilities, gender gaps, and adaptive capacity

The review of the different social aspects that we discussed in the previous chapter shows that women leave with a number of obstacles to their necessary adaptation to the effects of climate change. The evidence gathered during the survey tells us a series of gender gaps in family activities and livelihood production, in participation and in the power of expression and decision-making. These gaps, like those identified at the macro level in the sectors of education, employment, health, violence, determine the different way in which men and women will be exposed to climate change and their ability to mitigate its effects by studying their adaptive capacities.

Key vulnerabilities		Vulnerabilities
<b>Production</b>	<i>Household chores</i>	Increased workload (productive, home, child management) mainly related to lack of access to resources and basic necessities (water, energy, food, etc.)
	<i>Revenue-generating activities</i>	Significant dependence on the agricultural sector
<b>Resources</b>	<i>Property</i>	Greater financial losses Loss and damage of property under their responsibilities (administrative papers, house ...)
	<i>Services</i>	Lack of access to main services (health, sanitation, schools, waste treatment site, etc.) Reduced access to credit
	<i>Health</i>	A state of health (physical and mental) sensitive to climate change (diseases, injuries, depressions, etc.)
<b>Human capital</b>	<i>Access to information and technology</i>	Poor access to weather reports and alert messages
	<i>Education</i>	Low level of education and training
	<i>Decision-making power</i>	Limited access to decision-making (personal and public sphere)
<b>Decision-making and participation</b>	<i>Participation</i>	Limited access to community speaking spaces
	<i>Gender-based violence</i>	Increased risk of gender-based violence
<b>Gender-based violence and urban space</b>	<i>Urban space</i>	Public spaces that promote insecurity and exclusion (lack of light, fewer people on the streets, etc.)

The main factors that support gender gaps are for women:

Difficult access to natural resources (water and fuels), while they are in charge of the activities that require these supplies on a daily basis,

Poorer access to care, greater susceptibility to disease in pregnancy and greater unmet hygiene needs in flooding

The long working time in the family sphere given to household chores that influences and reduces their ability to participate both in the productive field and in activities and places of collective and political decision-making

Their exclusion from the public sphere and from community spaces of speech and decision-making that prevent the implementation of specific policies for them.

Lack of access to public services and infrastructure that could ease the workload of the family and allow them time to train, participate in development initiatives, set up AGRs or find jobs

- ▶ Violence that limits both their power in the family and their ability to circulate in public spaces and causes injuries, physical and psychological trauma

Limits in access to credit that reduce their possibility of investment in their productive activities but also their ability to recover from a flood that can be the cause of a loss of income and require investments to rebuild the place of life for example.

- ▶ Lack of access to land ownership, which limits decision-making rights over agricultural and vegetable production and household real estate and is a source of insecurity
- ▶ The low levels of literacy, schooling, training that exclude them both in terms of employment, the ability to guide and develop more profitable businesses, and support the belief of a certain inability to take part in decisions, collective or family.

The low level of education that limits their access to information in the event of a flood alert that prevents any possible anticipation.

- ▶ Submission to discriminatory social norms that relegate them to the background depriving them of decision-making power over many aspects of their lives at the family, collective or production level.

These social inequalities have serious repercussions on the lives of many women.

However, we have identified adaptive strategies that directly reduce the vulnerabilities mentioned above. Taking into account these adaptive capacities has served us to develop the actions presented below. However, it is important to specify that this adaptive capacity is reactive and not sustainable while the proposed actions seek to anchor an incremental adaptation that promotes long-term change.

In addition, the adaptive capacities identified are mainly based on mutual assistance within the structuring information community.

- ▶ Purchase of essential products (oil, salt, soap) in very small quantities to avoid excessive loss of goods if a flood occurs,
- ▶ Production work source of income to prevent possible unforeseen expenses related to the destruction of property.
- ▶ Community works (construction of dikes) to protect homes from possible flooding
- ▶ Call for informal credit (small loans from traders in the area, indebtedness to neighbors and family members) to compensate for the lack of income and devote themselves fully to the search for resources essential to the survival of the family in the event of a natural event,
- ▶ Borrowing goods from friends for resale (sale on the run) and revival of a small business after a flood,
- ▶ Strong community mutual aid to repair public places, community and services (women's group organized to participate in the collective work of repairing the dike in Walia and to build paths, organizations by women's groups of waste collection, cleaning of schools and health centers (4th) and to seek support and humanitarian aid .)
- ▶ Use of natural medicine for health

Faced with these field observations, it is necessary to work through specific actions to strengthen the resilience of women by addressing the vulnerabilities identified. Adaptation does not aim to prevent a natural hazard but rather aims to reduce the risks for the population in terms of vulnerability, to increase the adaptive capacities of the populations but also to rely on the opportunities specific to N'Djamena, namely:

- ▶ An institutional mobilization with an increasingly important presence of women: a national and local (municipal) framework with women increasingly present in the political world (assembly, neighborhood community)
- ▶ Building on the strength of the community

Foster empowerment: women within the community itself can inspire and carry women's voices (Taking advantage of public places where the presence of women is important to convey information : even if the rate of schooling of young girls decreases over time, school can be considered a strong place of transmission just like markets where women are very present.

- ▶ Relying on the strength and resilience of women

Men, on the other hand, are subject to social pressures in terms of economic responsibilities. In times of environmental crisis, they face certain difficulties in carrying out productive work, in providing

livelihoods to relatives and in the face of the destruction of property (crops and crops). Gender social norms then act on them, in these moments, in a brutal way with psycho-social consequences (frustration, depression, apathy, alcohol addiction, violence) related to the impossibility of meeting their obligations as breadwinner.

If the extreme vulnerability of these populations to climate change requires adaptive measures, these must be done taking into account disparities between women and men so that gender gaps do not widen further. Climate change adaptation strategies will be more effective if they are built through a decision-making process in which all people participate.

## 7 PROPOSAL FOR ACTIONS TO REDUCE GENDER GAPS

The strategic lines of action proposed in this chapter aim to respond to gender inequalities and to put in place measures that make it possible to act to limit and reduce gender gaps in general and specifically in the face of climate change.

The preliminary analysis made on gender gaps guides the actions to be implemented around 7 axes that must be found in the three components of the project.

It is not at this stage to define a transversal action plan but to propose activities that support the reduction of gender gaps and the promotion of gender equality in an urban resilience project in N'Djamena. These proposals for strategic actions are envisaged to meet the needs and support women's expectations and capacities in terms of adaptation.

### 7.1 Levers that promote the reduction of inequalities.

Strategic actions are organized around seven levers that promote the reduction of inequalities.

These are:

- 1) Adapting by reducing **family burdens for women** and girls

Adapting to produce and market: promoting new entrepreneurial, agroecological and agroforestry practices

Recruiting: jobs and selection of women (and youth)

- 1) Participate: consultation, training, information, decision

Taking Action and Being Recognized: **Promoting Women's And Youth Groups**

- 2) Promoting gender: **training – stakeholder awareness**
- 3) Knowledge: analysis, production of gender-specific data and gender research

The following chapter identifies actions that could be implemented as part of the project led by the World Bank in N'Djamena. Among the actions that are envisaged in the project components to act on gender equality are women's access to green jobs, training and skills development, support for small and medium-sized enterprises and investments on labour-intensive activities.

These adaptation actions aim to reduce vulnerabilities that specifically affect women by building resilience while trying to address development issues. These so-called reduction adjustment actions have the impacts of climate change while creating new opportunities, both for women and for the population as a whole. The aim will be to promote a so-called long-term **incremental adaptation** that makes them more resilient to the shocks and stresses they may face.

## ACTION I - Adapting by reducing family burdens for women and girls: Facilitating access to water, fuel and energy

Adapting by reducing family burdens for women and girls: Facilitating access to water, fuel and energy	Possible solutions to protect access to water during floods (Water reserve at height).	→ Number and % of women with better access to water (time/transport) for human consumption, % of women/households headed by women → Number and % of women with better access to water (time/transport) for production; % of women heads of household; % of women/households headed by women.
	Renaturation of watercourses, development of banks and the creation of green corridors with certain plant species with rapid production of wood or other. The management of these spaces could be envisaged through support for private initiatives for the sustainable management of wooded heritage, with priority given to women's cooperatives or women's businesses.	→ Number of communities and % of women in these communities who benefit from sustainable watershed management.

Since women are responsible for collecting water and energy, activities that are heavily affected by flooding, measures to reduce the time spent on these activities will help reduce this gap.

The collection of water is not only for human consumption, it is also necessary for women's productive activities in N'Djamena, such as urban agriculture. Women are over-represented in urban agriculture, however, as climate change has resulted in the loss of arable land and soil fertility for market gardening (floods, soil leaching and landslides). Field surveys have shown that food and vegetable production in the Walia area is essential to the household economy and that women are responsible for providing food in the household. Women sell part of their production in local markets or use it for self-consumption. The main problem that women repeatedly mention is famine due to lack of food and inability to provide food during floods.

These activities address this and other vulnerabilities. As the Urban Resilience Project envisages the creation of green and grey infrastructure to ensure flood protection, these activities can be integrated into this objective.

Structural inequalities, which also reflect social norms, are also reflected in green jobs. This is why measures around employment must be combined with actions: to reduce the workload of women; strengthening women's participation in consultations and decisions; strengthening women's organizations; strengthening gender counterparts.

## 7.2 ACTION II - Adapt by creating income-generating opportunities by promoting new entrepreneurial, agroecological and agroforestry practices (women and youth)

Adapt by creating income-generating opportunities by promoting new	Support the training, development of women's sustainable skills and technical capacities in market gardening and other agricultural production (water use, natural amendment), forest maintenance (soft cuts, grafts, etc.).	→ Number of training or capacity building beneficiaries disaggregated by gender and age group.
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entrepreneurial, agroecological and agroforestry practices (women and youth)	Provide gender-based training programmes to develop skills and knowledge to facilitate the creation of small and medium-sized enterprises	
	Offer gender-based training programmes that develop knowledge and skills on recycling, its techniques, entrepreneurship in the field of waste management management, maintenance of latrines and green spaces (areas used for defecation)	
	Promote the exchange of practices between women and the recognition of innovations and technical successes (field school, exchange of commercial practices, etc.)	→ Number of women-specific exchange meetings
	Propose income-generating activities for women based on green value chain studies (e.g. nurseries, grain banks, etc.)	→ Number and percentage of women affected by increased economic resilience; including the number and % of women/
	Promote the creation of micro-enterprises for the manufacture of waterproof bags, pouches and boxes that are resistant to flooding.	Number and % of women with increased economic resilience; including number and % of women/ femmes à la tête d'une ménage.
	Facilitate and promote access to green jobs within the different components of the World Bank project, which will generate a significant number of local jobs.	→ Number of women among all employees hired on project operations (of which 50% of women must be women and 30% young people), disaggregated according to the nature of the position and hierarchical levels.
	Organization of a manual waste collection campaign and its transfer to sorting centers through associations promoting the employment of women and young people (7 members of the CELIAF association work on environmental issues)	→ Number of waste collection campaigns → Number of women's associations related to the collection, transfer and treatment of waste → Number and per cent of women and men who participated in a waste collection campaign.

The creation of green jobs and the rise of Nature-Based Solutions in N'Djamena represent an important lever to reduce gender gaps while providing significant co-benefits related to climate change. Therefore, this issue must be addressed carefully if the objective is a real opening to new job opportunities for women.

Around this topic, UN Women and the AfDB conducted a study on green job opportunities for women in Africa and on the sectors likely to offer the most opportunities. This report highlights on the one hand **that there are risks that women will be confined to low-end green jobs, so the new green jobs are a favourable opportunity for women to enter high-end jobs.**

"The transition to a green economy offers unique opportunities to reduce gender inequalities in the labour market in sub-Saharan Africa, including:

- Change perceptions about jobs that are acceptable for both men and women. Many jobs in the green economy will be in new occupations that are not yet socially attributed to men or women. Thus, there are opportunities for women to apply for new jobs as engineers, architects, energy efficiency consultants, green bus drivers or green innovators in many different fields. (...)
- Assign an economic value to women's unpaid work related to the environment. This can be achieved through economic instruments such as carbon credits and payments for environmental service programmes in tourism, forestry and other sectors. In addition, the transition to green economic activity

can be associated with upgrading and formalizing women's current activities in the informal economy in waste management and agriculture through women-led collectives and networks."<sup>99</sup>

Indeed, while women are able to access green jobs in many sectors, they are very little oriented towards green jobs with high added value where women's participation is lower (solar and wind energy, transport, and construction). In general, women are primarily oriented towards low value-added jobs such as greening conventional agriculture, forestry or waste and which experience poor working conditions, pay and stability.

However, supporting and strengthening the penetration of sectors, where women are not well represented, would have multiplier effects on future generations in terms of women's employment, for example in indirect jobs in green construction, renovations or energy efficiency.

The issue of women's employment is both long-term and short-term. It is likely that in the short term many of the green jobs for women will be low-quality jobs. That is why we must improve the conditions for the exercise of these jobs through training, equipment and remuneration and, at the same time, lay the foundations for access to better quality jobs through training, support for the transition of women into non-conventional sectors and support for women's entrepreneurship.

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<sup>99</sup> *Green Jobs for Women in Africa*, UN Women and the African Development Bank (AfDB), 2021.P.12

**FIGURE 1**  
**Potentiel des emplois verts pour les femmes dans les secteurs de l'économie d'Afrique subsaharienne**

Secteur	Potentiel de créer de emplois verts	Potentiel de créer des emplois verts à haute valeur ajoutée	Domaines de réussite rapide pour l'emploi des femmes en Afrique subsaharienne
Agriculture (écologisation ou conventionnelle)	●	●	●
Agriculture (biologique/agriculture de conservation)	●	●	●
Pêche	●	●	●
Foresterie (gestion durable des forêts et reboisement)	● → ●	●	●
Nouveaux services verts	●	● → ●	●
Tourisme (tourisme vert et nature/écotourisme)	●	●	●
Gestion des déchets/ recyclage	● → ●	●	●
Transports	●	● → ●	● → ●
Énergie solaire	●	●	● → ●
Énergie de la biomasse	●	●	●
Énergie éolienne	●	●	●
Construction	●	●	●

Note : Ce tableau présente un résumé visuel des résultats de l'exercice de cartographie visant à identifier des opportunités d'emploi vert pour les femmes en Afrique subsaharienne. Une analyse détaillée figure à la section 3 de ce rapport ainsi qu'à l'Annexe I. La deuxième colonne de ce tableau classe les secteurs selon leur potentiel de créer des emplois verts. La troisième colonne présente des informations relatives à la qualité des emplois verts susceptibles d'être créés dans chaque secteur. La dernière colonne classe les secteurs selon leur potentiel comme gain rapide pour la participation des femmes dans les emplois verts dans le futur, sur la base des niveaux actuels de participation des femmes au marché du travail dans le secteur en Afrique subsaharienne.

● Faible ● Intermédiaire ● Élevé

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## ACTION III - Adapt by promoting access to information, participation and decision-making

<p>Adapt by promoting access to information, participation and decision-making</p>	<p>Dissemination of meteorological information and early warnings for women (translated into language dialects) through:</p> <ul style="list-style-type: none"> <li>- The radio programming of the women's house</li> <li>- The 3000 member associations of CELIAF of a culture of climate resilience</li> </ul>	<ul style="list-style-type: none"> <li>→ Number of radio programs, signs or written communications related to weather and climate hazards.</li> <li>→ Study of how women access and interpret early warning messages, and lessons learned integrated into message formats and dissemination processes.</li> </ul>
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Community participation is highly controlled and prioritized, both by gender and age. Middle-aged men control and direct the spaces for discussion and decision-making from which women and young people are excluded.

As a result, women's voices are not heard and their needs cannot be taken into account even though their vulnerabilities to flood risk are high. As a result, they are also forgotten about the programs and policies to be put in place that would reduce their vulnerabilities.

This activity aims to start integrating women into climate issues by transferring a minimum of information. On the one hand, it will make it possible to prepare for the effects of floods or high temperatures, and on the other hand, it will contribute to the strengthening of women's associations involved in environmental issues. This strengthening can lead to a more active participation of women in Community decision-making.

### 7.3 Other complementary activities

#### Promoting gender and climate actions : Partenaires

The network of CELIA women's associations, which is recognised in Chad, can be a facilitating actor in the implementation of these actions. The work articulated with this network in all the proposed activities will allow a multiplier effect of the expected impacts.

It is also possible to strengthen the gender and climate promotion actions already initiated by the network. For example, the week of the tree, or around waste management, composting, the promotion of Ecosan latrines<sup>100</sup>

The "women's house" may also be involved in activities aimed at strengthening its skills and encouraging women's participation in civilian life. It can contribute to the establishment and monitoring of gender and climate activities.

#### 7.3.1 Knowledge: analysis, gender data production and gender research

One of the levers to ensure the continuation of efforts for women's resilience to climate change is the systematic collection of gender-specific data on all World Bank projects in Ndjamena and the monitoring of indicators based on this data.

Our recommendations will be:

- ▶ systematically integrate gender-specific data collection into the terms of reference of design offices
- ▶ insert gender action plans into project studies

to carry out a precise monitoring of gender-specific indicators vis-à-vis the objectives set by the project.

<sup>100</sup> Project conducted with OXFAM.

## 8 ANNEXES

### Annexe 1. Bibliography

- Afd. 2016. *Gender profile of Chad*. <https://www.afd.fr/fr/ressources/profil-genre-afrique>
- Afd. 2017. Flood Risk and Cities in Developing Countries, Technical Note No. 35
- Afd. 2020. *Floods, better to prevent*, Technical Reports No. 62
- Alexandra DiOrio<sup>1</sup> & Dr. Andrea Crivelli-Kovach, *The Global and Local Factors Influencing Maternal Mortality Ratios: Barriers and Recommendations for Success*. In: Journal of Social Science for Policy Implications, September 2014.
- Andrew Norton, Virginie Le Masson, Emily Wilkinson. 2016. *Gender and Resilience*. BRACED
- CARE. 2019. Vulnerability Analysis and Climate Change Adaptive Capacity. Resilience and gender equality. Version 2.0
- CARE. 2016. Gender Dynamics in a Changing Climate: How Gender and Adaptive Capacity Affect Resilience
- Caruso, B.A., Conrad, A., Salinger, A., Patrick, M., Youm, A., & Sinharoy, S. 2021. *A Conceptual Framework to Inform National and Global Monitoring of Gender Equality in WASH*. Emory University/WHO/UNICEF JMP team
- Cea. 2009. *Gender and Climate Change. Women Matter*. United Nations Economic Commission for Africa
- Chad Hydromet Services – Gender Analysis and Gender Action Plan
- South Coordination. 2021. Capitalization: how to integrate a gender approach into climate projects?
- Colette Benoudji & Virginie Le Masson, Social norms, texts and practices: their influence on gender (in)equality and women's rights in resilient development. Oxfam final report. Chad 2021
- Colette Benoudji, Virginie Le Masson, Erlande Fanord. Study on Gender and Resilience Final report for the RESTE/Trust Fund project in Chad 2018.
- Colette Benoudji, Virginie Le Masson, Sandra Sotelo Reyes, Giselle Bernard. *violence against women and girls and the resilience :p perspective of the Chadian context*. Working papers. BRACED edition. 2018
- Red Cross. Jefson Damey. 2021. Report on the coordination of flood response activities in Ndjamenachad
- Eric Neumayer & Thomas Plümpner, The Gendered Nature of Natural Disasters: The Impact of Catastrophic Events on the Gender Gap in Life Expectancy, 1981–2002, Annals of the Association of American Geographers, 2007.
- FAO ECCAS. 2018. National Gender Profile of the Agriculture and Rural Development Sectors, CHAD.
- FAO and ECCAS. 2021. National Gender Profile of the Agriculture and Rural Development Sectors – Chad. N' Djamena. <https://doi.org/10.4060/cb3046en>
- Gallopín, G (2006). "Linkages between vulnerability, resilience, and adaptive capacity." Global Environmental Change 16(3): 293-303
- Gca. 2021. State and Trends in adaptation Report 2021
- GCA.2021. Green Bonds for Climate Resilience: A guide for issuers
- Gem. 2016. *Gender and Emergency Management guidelines:a literature review* <https://www.genderanddisaster.com.au/wp-content/uploads/2016/08/GEM-Literature-review.pdf>
- Githeko, A.K., Lindsay S.W., Confalonierie, E.W., Patw J.A. (2000). Climate change and vector-borne diseases: a regional analysis. Environment and Health

- GIZ, 2016. Integrate climate change adaptation into development planning. Germany
- Green Climate Fund.2019. Country programme for Chad's Green Climate Fund.
- ICRC, Climate Centre, Country level, climate fact sheet, 2021.
- IPCC (2014). Summary for policymakers. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA: 1-32.
- Ismaël Maazaz, "Hydraulic bricolages: coexisting water supply and access regimes in N'Djamena, Chad", *EchoGéo* [Online], 57 | 2021, Online since 01 December 2021, connection on 10 August 2022. URL: <http://journals.openedition.org/echogeo/22514>; DOI: <https://doi.org/10.4000/echogeo.22514>
- Javier HERRERA, Constance TORELLI. 2017. Domestic work and employment: what trade-off for women? In urban labour markets in sub-Saharan Africa. Edition ADF & URD
- María Nieves Rico, Olga Segovia. 2017. *Quién cuida en la ciudad? Aportes para políticas urbanas de igualdad*. Comisión Económica para América Latina y el Caribe (CEPAL), Chile.
- Markhous N.A, Tidjani A., Doungous, D.M., Amoukou, I., Abdourahamane B.. (2019). "Analysis of health risk factors in the vegetable production chain in the city of N'Djamena, Journal of Flood Research 8(3)
- Marylène Lieber. 2008. Gender, violence and public spaces: the vulnerability of women in question. Ed. SciencesPo Press.
- MICS 2015, Demographic and Health Survey and Multiple Indicators (EDS-MICS 2014-2015), Rockville, Maryland, USA: INSEED, MSP and ICF International
- MICS6-2019, Demographic and Health Survey and Multiple Indicators, MICS6-Chad, 2019. INSEED and
- Ndogonoudji A. (2014), Vegetable production in the city of N'Djamena (Chad): State of play and prospects. *Revue scientifique du Tchad*, CNAR, 7pages.
- OCHA. 2020. CHAD *Status report: 6/11/2020*. <https://reports.unocha.org/fr/country/chad/card/2v8Nd7kiUR/>
- OCHA. 2021. CHAD Flood Overview. Status report: 24/09/2021. [www.unocha.org/tchad](http://www.unocha.org/tchad)
- OCHA. 2022. *CHAD Status Report: March 17, 2022*. <https://reports.unocha.org/fr/country/chad/>
- WHO. 2017. Climate Change, Gender and Health, 2016
- UN. 1993. Declaration on the Elimination of Violence against Women. Resolution 48/104 of 20 December 1993
- UN. 2017. *Gender issues and climate change*. Framework Convention on Climate Change. Forty-seventh session Bonn, 6-15 November 2017. Agenda item 20.
- UN. 2021. *Annual technical activity report of the Paris Committee on Capacity Building*. Framework Convention on Climate Change. Fifty-second to fifty-fifth session Glasgow, 31 October-6 November 2021
- UN Women.2016. Leveraging co-benefits between gender Equality and Climate Action for Sustainable. New York, UN WOMEN
- UN Women.2016. Gender capacity diagnostic tool. New York, UN WOMEN
- UN Women.2019. Safe Cities and Safe Public Spaces for Women and Girls Global Flagship Initiative: International. Compendium of Practices. New York, UN WOMEN
- UN Women 2020. Safe Cities Report 2017-2020 <https://www.unwomen.org/sites/default/files/2021-12/Safe-Cities-and-Safe-Public-Spaces-global-results-report-2017-2020-fr.pdf>
- UN Women - AfDB. 2021. *Green jobs for women in Africa*. New York, UN WOMEN

- OXFAM. 2002. BAÏWONG DJIBERGUI AMANE Rosine. Documentary Study and Analysis of Violence Suffered by Women in Chad
- WFP-USAID. 2017. Cash Transfers, Empowerment and Gender in Chad.
- PASEC. 2016 -2014. Performance of the Chadian education system: Skills and success factors at the primary level. PASEC, CONFEMEN, Dakar.
- UNDP. 2009. Training Manual on gender and Climate Change, Ed. UNDP, IUCN, UNEP, WEDO. /
- UNDP. 2010. Gender, Climate Change and Community - based adaptation, a guide book.
- UNDP. 2016. Accelerating progress towards gender equality and women's empowerment in Africa. Human Development Report 2016.
- UNDP. 2019 Human Development Report 2019 Beyond Incomes, Averages and the Present Time: Inequalities in Human Development in the Twenty-first Century
- UNDP. 2020. *Broadening the horizon of people and the planet: human development and the Anthropocene*. Country information note on the Human Development Report 2020 Chad.
- Republic of Chad. 2011. *National Gender Policy*.
- Republic of Chad. 2019. Five-Year Action Plan 2019-2023 of THE -PNG – Chad
- Republic of Chad. 2019. National evaluation report on the 25 years of implementation of the Beijing Declaration and Platform for Action.
- Republic of Chad. 2019. Roadmap to address child marriage and female genital mutilation in Chad, 2019 2021
- Republic of Chad. 2020. Chad's Third National Communication (TCN) on Climate Change
- Republic of Chad. 2021. First national climate change adaptation plan of the Republic of Chad
- Republic of Chad. 2021. *Update of the Nationally Determined Contribution (NDC)*. Update document of the Republic of Chad for the period 2021-2030 of the Paris Agreement.
- Republic of Chad. 2021. Knowledge, attitudes and behaviours related to gender and climate change in Chad: Avenues for reflection to inform the National Adaptation Plan (NAP) process
- Republic of Chad. 2021. SMART National Retrospective Nutrition and Mortality Survey 2021. UNICEF. 2020
- Shepard, C.C., Agostini V.N., Gilmer, B., Allen, T., Stone, J., Brooks, W., Beck M.W (2012). " Assessing future risk: quantifying the effects of sea level rise on storm surge risk for the southern shores of Long Island, New York". *Natural Hazards* 60:727-745
- ThinkHazard! 2020. Identify natural hazards in your project area and understand how to reduce their impact Chad. Report from <https://thinkhazard.org/en/report/50-chad>
- UNESCO. 2022. *Groundwater: making the invisible visible*. United Nations World Water Development Report. UNESCO, Paris.
- WECF. 2016. *Gender and Climate Solutions*. Women Engage for a Common Future (WECF)
- World Bank. 2006. *Gender, Time Usen and Poverty in Sub-Saharan Africa*, Edited by C. Mark Blackden and Quentin Working paper N°. 73
- World Bank, 2006. Domestic work and employment: what trade-off for women?
- World Bank. 2016. World Bank Environmental and Social Framework.
- World Bank. 2017. Nature-Based Flood Protection Devices: Principle and Recommendations for Implementation. Washington, D.C.
- World Bank. 2018. Reducing gender inequalities in Mali, Chad, Niger and Guinea.
- World Bank. 2019. *The Benefits of Parity: Unleashing the Potential of Women's Entrepreneurship in Africa*. Innovation Lab for Gender Equality in Africa, World Bank Group, 2019.
- World Bank. 2020. Chad: the economic benefits of a post-COVID-19 society that cares about gender equality.

World Bank, 2021. Chad: Poverty Assessment: Investing in increasing rural incomes, human capital and resilience to support sustainable poverty reduction. Washington, D.C.

World Bank, 2021. Chad: Note on the economic situation: recovering from shocks.

World Bank. 2021. Climate Change Action Plan 2021-2025: Supporting Green, Resilient, and Inclusive Development. Washington, D.C.

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