An Overview of Niger's Food System: Outcomes, Drivers & Activities

Foresight4Food

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Key messages

Located at the heart of the Sahel with a population of over 25 million, Niger is the largest country in West Africa. With over two-thirds of the country situated in the Sahara desert, Niger's food system is subject to harsh environmental conditions with degrading natural resources and intensifying desertification. The extensive agricultural zones in the Soudano-Sahel regions are undergoing widespread population and economic growth, causing agricultural expansion to encroach into the pastoral livestock areas. This has occurred to the extent that agroclimatic conditions are no longer conducive to farming. Consequently, frequent outbursts of conflict occur amongst different farming systems as a result of competition over limited resources, and this is further aggravated by complex land tenure systems. Niger faces an influx of refugees fleeing conflicts in Nigeria and Mali, as well as increasing numbers of internally displaced people. Driven by climatic and governmental crises, and accompanying economic difficulties, Niger has experienced decades of political instability, including the recent coup d'état in July 2023. The coup will have widespread implications for Niger, with the country's future uncertain.

Niger's food system employs more than 75% of its population. Livestock and agriculture make up 42% of the GDP *and is one of the main contributors to the country's economy alongside mining.* The food system has contributed to decreasing poverty and has gradually reduced the national prevalence of undernourishment. Despite this, a significant proportion of the population are affected by malnutrition, leading to inadequate diets resulting from fluctuations in domestic food production and price volatility of imported foods. Climate change aggravates the food system, leading to frequent food shortages. In response to recurrent crisis and these food shortages, Niger has committed to improving food security and established the '3N' Initiative to eradicate extreme poverty and hunger and to ensure environmental sustainability. However, the 2023 military coup will have significant consequences.

This overview is intended to build a collective understanding of key dynamics in food system outcomes, drivers and activities. It will help to identify trends and uncertainties that will shape the future of the food system, in addition to providing the foundation for a comprehensive and participatory process that draws upon foresight and scenario analyses that support food systems change.

Highlights of Niger's food system

- **Agricultural practices are at the heart of the economy:** With more than 75% of Niger's population relying on a combination of agricultural production and livestock ownership for food and income, agriculture, forestry and fisheries contributed to 36.5% and livestock 8.54% of the GDP in 2021 and 2018, respectively.
- **Complex land management systems:** Population growth places increasing pressure on available land, undermining customary land tenure regimes, with the commons being exposed to land acquisitions. Consequently, Niger's different farming systems have to compete for the same resources. This leads to frequent outbursts of conflict and land degradation.
- **Rising food prices:** Described as having a negative food trade balance with food imports exceeding exports, Niger is vulnerable to external shocks from the international market. Since it is dependent on imports from neighboring countries, the rising instability and outbreaks of violence have caused further price inflation.
- **Food and nutrition security challenges:** The average availability of calories in Niger remains below the vulnerability threshold for chronic malnutrition. In 2017, chronic malnutrition affected 42% of children below five years of age, with undernourishment reaching 19.8% in 2019/2021. Currently, ~20% of the population are unable to meet their food needs. Despite this, the prevalence of overweight amongst adults is on the rise, increasing from 18.2% in 2000 to 29.7% in 2016.

1 Introduction

The urgency of food systems transformation

Food systems transformation is considered an urgent issue globally. Climate change, COVID-19, the Russia-Ukraine war and price hikes of food have awakened the international community to the importance of reconsidering how we produce, handle, consume and manage food waste to ensure food security for and future generations. The challenge is working out how to bring about the transformations that will enable better nutrition, sustainability, inclusiveness and resilience.

This urgency requires a systemic approach to policy making, which is integrated with futures thinking, to assesses the longer-term requirements and consequences of alternative scenarios. Creating the political will for and societal understanding of change demands effective processes of scientifically informed stakeholder engagement. This can be achieved by integrating systems approaches with foresight and scenario analysis, supported by the effective use of data, computer modelling and visualisation.

Prioritising food systems change in Niger

In response to widespread food shortages and high poverty levels, the Niger government launched the 3N initiative in 2012 (Les Nigériens Nourrissent les Nigériens). This represents a significant national commitment to accelerating Millennium Development Goals 1 and 7: eradicating extreme poverty and hunger and ensuring environmental sustainability (HC3N, 2023). Niger has an active policy landscape that promotes national strategies and development plans across many sectors, including agriculture and livestock to promote sustainable, resilient and economic growth. Since 2005, over 42 national strategy documents have been published (RECA Niger, 2023). Several examples include the Sustainable Livestock Development Strategy (2012–2035) and the Action Plan of the 3N initiative: Strategy for food and nutrition security and sustainable agricultural development (2021–2025) (RECA Niger, 2023).

Niger has been actively engaged with the UN Food Systems Summit network and has facilitated national dialogues on the food system and its outcomes. Following the UNFSS in 2021, Niger constructed a roadmap to operationalise food system transformation pathways to create a healthy vision for 2030. This includes building on an existing pathway for change represented by the alignment between Niger's national, political and strategic frameworks with those presented by UNFSS. Niger has identified seven national priority pathways towards sustainable and nutrition-sensitive food systems by 2030 that have been incorporated into the I3N's strategic framework:

1. Improve the governance and financing of food systems.
2. Instigate administrative and legislative reforms accompanied by acts facilitating their operationalisation.
3. Promote priority value chains of food products with high nutritional and commercial potential.
4. Strengthen research and innovation for sustainable food systems.
5. Promote and strengthen agricultural extension and advisory support.
6. Support resilience building and recovery.
7. Make quality statistical data available and strengthen systems sectoral information and monitoring-evaluation.

(Republique du Niger & UNFSS, 2021)

In February 2023, Niger hosted the African Regional Preparatory Meeting for the UN Food Systems Summit and two stocktaking moments in preparation of the global event in July.

However, on 26 July 2023, a coup d'état took place, interrupting more than ten years of combined efforts by the state, its partners, and peasant and herders' organisations in the process of modernising the food system. It remains to be seen what the full impact of the coup will be on the evolution of Niger's food system. Recent sources suggest that the sociopolitical situation and consequent

ECOWAS trade sanctions have caused households' food situations to deteriorate due to insecurity (FEWS NET, 2024). Market disruptions have caused prices to rise up to 40% compared to the five-year average. In January 2024, it was reported that at least 20% of households across multiple regions face food shortages (Diffa, Tahoua, Tillabéry and Maradi) (FEWS NET, 2024).

Foresight4Food recognises the active landscape of initiatives that work together toward a common goal: promoting sustainable food system transformation in Niger. Foresight4Food aims to complement these actions and compile recent work on Niger's food system to create a comprehensive account of Niger's food system. The AgrInvest-Food Systems Project/FAO is well regarded as a result of a stakeholder-conducted scoping study of Niger's agrifood system (Karkare & Van Seters, 2021). The food systems assessment conducted by FAO, EU and Cirad (2023) is also recognised as a foundational step for working towards a national shared understanding of Niger's food system (FAO, Union Européenne & Cirad, 2023). Foresight4Food complements the World Bank's Agriculture and Livestock Transformation Project (PIMELAN) implemented between 2019 and 2025 (World Bank, 2019).

This report is intended to create a collective understanding of key dynamics in food system outcomes, drivers and activities. It will help identify trends and uncertainties that shape the future of the food system and to provide the foundation for a comprehensive and participatory process that draws on foresight and scenario analyses that support food systems change.

The report is structured as follows:

- Chapter 2 outlines the approach and methodology for this food system overview. It shows how the report builds on the concept of food system analysis and how it applies to Niger's context.
- Chapter 3 provides insights into the regional context and geography of Niger's food system, and it describes Niger's policy landscape, climate and agroecological zones.
- Chapter 4 describes the main outcomes for Niger's food system in terms of food and nutrition security, economic and social wellbeing and environmental sustainability.
- Chapter 5 provides an overview of the key drivers of Niger's food system: demographics, development, consumption, technology, markets, climate, environment, policy and geopolitics. This chapter also describes the impacts of recent shocks like the recent pandemic and the war in Ukraine.
- Chapter 6 presents an overview of the key actors in Niger's food system and their activities. It also analyses the producers, processors, traders, retailers and consumers who shape the system.
- Chapter 7 describes the dynamics between the different elements in Niger's food system, focusing on key patterns, archetypical system behaviour, trade-offs, synergies and leverage points.
- Chapter 8 provides the conclusions of this food system mapping analysis, initial policy recommendations and suggestions for the next steps for research as part of the FoSTr programme.

This report is intended for discussion. It is and open to comments, suggestions and improvements. This published version provides a snapshot of the status of the food system as of January 2024, acknowledging the limited knowledge available on the more recent implications of the coup that occurred in July 2023.

Disclaimer

This report uses data from both national and global sources. It is important to acknowledge that we have prioritised national statistics whenever available. We understand that national and global datasets may not always coincide with each other, thus requiring continuous iterations to obtain accurate and up-to-date data.

2 Using a food systems approach

To identify key trends in Niger's food system, The Foresight4Food food system framework is used (Figure 1). This framework builds on previous work, incorporating elements of the food systems frameworks developed by Ingram (2011), HLPE (2016) and van Berkum et al. (2018). We use this framework as a basis and tailor elements to Niger's context while scanning for food system-related trends and major drivers. This framework describes the main components of a food system: activities and actors, outcomes, driving forces shaping food system, the relationships and feedback in the system.

A set of food system activities are at the core of food systems. These range from primary production to processing, retail, consumption, storage and disposal. Different actors perform these actions, and food systems involve multiple interacting value chains. To function, a broad set of supporting services are necessary, including physical and market infrastructure, transport, financial services, information and technology. The incentives and operating conditions are influenced by the institutional environment of policies, rules and regulations (e.g. food safety and quality, financial, taxation), consumer preferences and social norms. These institutions create the rules that govern how food systems function.

Food systems operate within the wider context of human and natural systems, and they have multiple interactions and feedback loops between these systems. These wider systems create a set of external drivers and the trends that shape the behaviour and evolution of the food system, although each actor in the system influences, is influenced and reacts accordingly. Drivers include population, wealth, consumption preferences, technological developments, markets, environmental factors and politics. The outcomes of food systems function can be categorised into three main areas: economic and social wellbeing, food and nutrition security, and environmental sustainability.

A food systems model provides the basis for understanding and exploring the critical relations, trends and trade-offs that will underpin any desired system transformation. For example, indicators for the three outcomes enable the assessment of whether food systems function in desirable or undesirable ways relative to wider societal and environmental objectives. The drivers enable the understanding of the pressures exerted on food systems and influence how they change, with these drivers being influenced by changes in outcomes in turn.

The review process

For this report, secondary data was gathered to identify the past and present key trends that shaped and shape Niger's food system and its outcomes. The approach consisted of an exploratory review to gain a general understanding of the processes that take place throughout the Niger food system. A range of sources were included to increase the validity of the review. These pertain to journal articles, policy briefs, governmental reports, resources from the Plate-forme National d'Informations pour la Nutrition (PNiN), Reseau National des Chambres D'agriculture du Niger (RECA) and statistical databases, such as FAOSTAT and World Bank Data.

Where multiple sources are available for the same indicator, the data from the most recent source was included and governmental documents were prioritised. Importantly, not all processes within the food system are mapped due to a lack of data and, in some instances, limited data accessibility. This makes it difficult to ensure a comprehensive and coherent narrative of the food system is conducted. This requires collaborative review, reflection and validation from stakeholders across the food system.

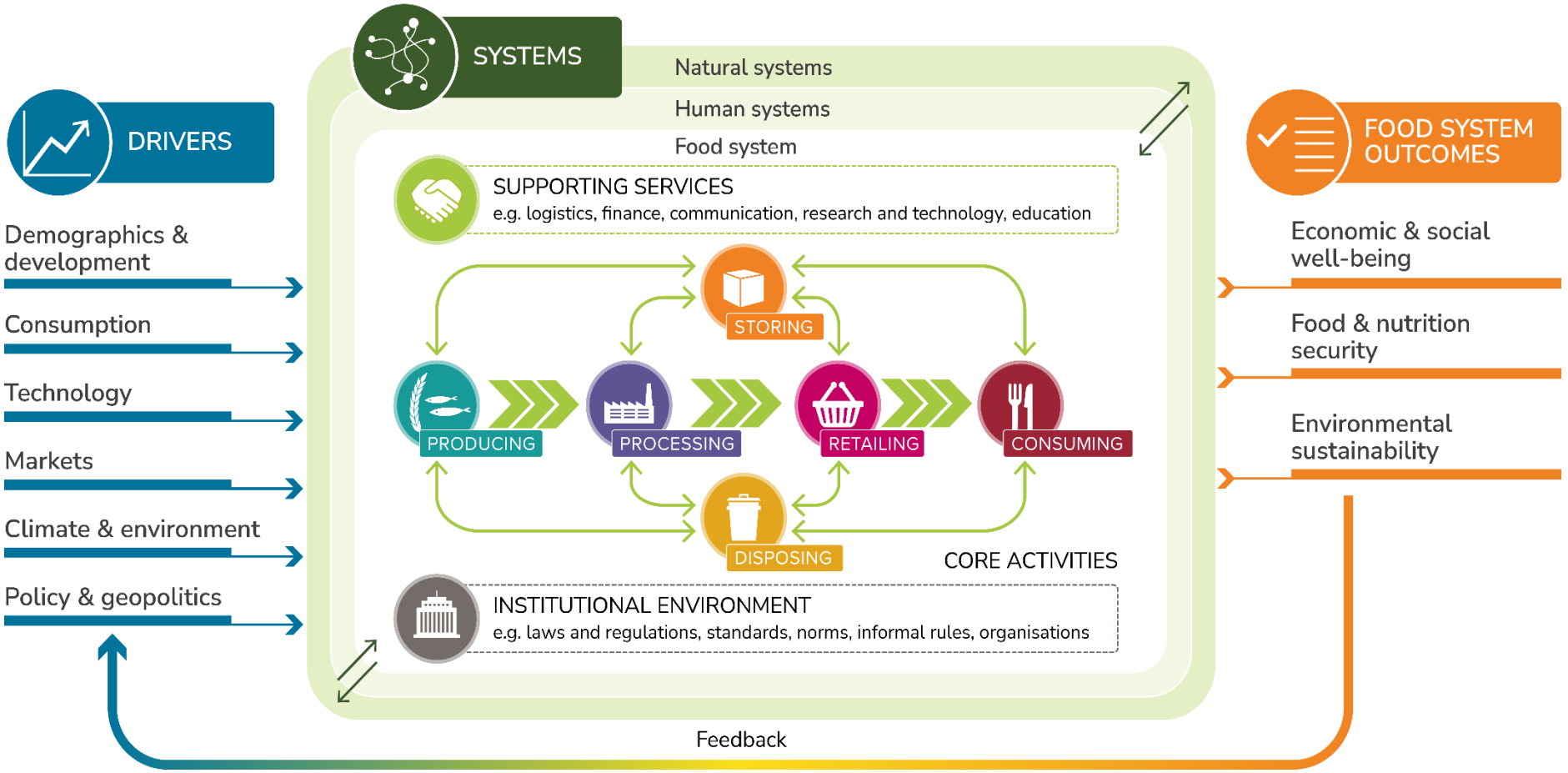

Figure 1 *The Foresight4Food food systems framework*

3 Context & geography

This chapter describes the regional context, agroecology and geography of Niger's food system.

3.1 Niger's context and history

Niger, located in the heart of the Sahel, is the largest country in West Africa at 1,267,000 km^2 and had a population of approximately 25 million as of 2021 (World Bank Data, 2021; Gagné, 2022). Niger has one of the most rapidly growing populations in West Africa at a rate of 4% per year (WFP, 2023). However, the country is ranked 189th out of 191 countries in the human development index (HDI). Two thirds of the country are located in the Sahara Desert, so agriculture is only possible in the southern part of the country. The degradation of natural resources and desertification are major issues across Niger: sandy areas increased by 24.8% between 1975 and 2016 (Gagné, 2022). Niger faces an influx of refugees. It currently hosts more than 700,000 displaced people, 64% of which are internally displaced, 36% refugees, 7% asylum and 5% are returnees; most refugees are fleeing from conflicts in Nigeria and Mali, and Burkina Faso, Sudan and Chad to a lesser extent (UNHCR, n.d.; World Bank, n.d.).

Since gaining independence from France on 3 August 1960, Niger has endured periods of authoritarian military rule (Stiftung, 2022). Niger experienced multiparty democracy for the first time in 1993. Since then, the country has seen five constitutions, four civilian governments, one period of military rule and two interim military governments. Constitutional rule was restored in 2011 following the election of Mahamadou Issoufou and his party PNDS-Tarayya. Mahamadou Issoufou remained in power until the 2020/2021 elections, when Niger witnessed its first peaceful handover of power from one civilian government to the next; Mohamed Bazoum took power. This peaceful election sparked hope for the return of democratic governance (Stiftung, 2022). However, on 26 July 2023, members of Bazoum's presidential guard dismissed him in the sixth coup in 50 years (World Bank, 2023a). In response to the 2023 coup, ECOWAS placed financial sanctions on Niger (World Bank, 2023a). The sanctions will have widespread implications for Niger as the country has been forced to reduce exports, which include crude oil and uranium (World Bank, 2023a). Niger's previous coups occurred in 1974, 1996, 1999, 2010 and 2011 (Garenne, 2021). Notably, this political instability was linked to climatic and governmental crises and accompanying economic difficulties. Being a land locked country, Niger has become dependent on other politically unstable countries; Niger faces dire socio-economic conditions that are the result of its political instability. Since the 1970s, a combination of drought and poor governance has aggravated the country's weak economic environment, leading to fluctuations in the country's GDP (Garenne, 2021).

3.2 The policy landscape

Niger has a rich and active policy environment in the sectors of agriculture, livestock, environment and economic and social development. Various national strategies and development plans have been implemented to guarantee sustainable and resilient economic growth (RECA Niger, 2023).

Niger's national strategy for food security and Sustainable Agricultural Development of the 3N Initiative was adopted in April 2012. The policy specifically aims to strengthen national capacities for food production, supply and resilience to food crises and disasters. The I3N initiative is divided into five-year action plans; the 2021–2025 year plan is currently being implemented (RECA Niger, 2021). To counter the challenges related to agricultural financing in the implementation of the 3N initiative, the Investment Fund for Food and Nutritional Security (FISAN) 2022–2026 was established to enhance/complement existing funding mechanisms (RECA Niger, 2017a). The FISAN's objective is to facilitate private and community investments in all segments of the food and agri-food value chains (see Section 5.7 for more detail).

3.3 Climate

Niger is one of the hottest and driest countries in the world, with more than 75% of the country located in a desert area. Niger has a semi-arid climate in the southern part of the country, while the centre and northern areas have an arid climate. Annual rainfall is low and mostly occurs during a wet season that lasts for about two to four months, in which the month of August usually experiences the most rainfall (République du Niger, 2020) (see Section 5.6 for more detail).

3.4 Agroecological and climate zones in Niger

Niger can largely be sub-divided into three major climatic zones based on rainfall levels and agricultural productivity (Figure 2) (République du Niger, 2020).

(i) **The Sudano-Sahelian Zone** (FEWS NET, 2014): This area corresponds to 1% (Sudan) and 2% (Sudano-Sahel) of the country and is located in the southern areas. These are sub-humid to semi-arid zones, and they receive 500–800 mm of rainfall annually. They are the most suitable areas for agricultural production, most prominently (rainfed) cereal and cash crop production. This area also harbours sedentary and transhumant livestock.

(ii) **The Sahelian Zone** (FEWS NET, 2014): This arid zone spans the central part of the country and is the most populous area, covering 15% of Niger. Receiving around 300–500 mm of rainfall annually, it is most favourable for mobile livestock production. Although rainfall is less frequent, it allows for rain-fed agricultural production. Agriculture and livestock keeping are combined in different livelihoods.

(iii) **The Saharo-Sahelian and Sahara Zones** (FEWS NET, 2014): This area occupies 13% and 69% of the country respectively, and it receives 200–300 mm or less than 200 mm of rainfall annually. Nomadic and transhumant pastoralism and oasis horticulture are the most common activities.

3.5 Water

The majority of Niger's surface water potential comes from the Niger river and its tributaries, which span 550 km (République du Niger, 2020). The river flow fluctuates significantly throughout the year. It peaks in the rainy season (June–September) and dries up between December and June. Lake Chad crosses into Niger, but it is progressively drying up due to climate change, and it has lost 90% of its surface area since the 1960s. Niger has 165 permanent ponds and 69 artificial reservoirs that harbour approximately 150 million m^3 of water (République du Niger, 2020).

3.6 Land, soil, forest and pasture

Niger is a vast plateau with an average elevation of 500 meters. The southern regions have the greatest agricultural potential, providing about 98% of arable land. The Sahelian zones of the country have larger proportions of vegetation cover. The central region is dominated by extensive pastoral zones that have short grass and sparsely scattered tree cover. The Niger river, which flows through the western part of the country, is the main source of freshwater, and it plays a prominent role in the country's transportation and irrigation (Sule & Odekunle, 2016). The farming and livestock production systems have traditionally been able to deal with climate variability and natural conditions (e.g. low soil fertility levels). Pastoralism in the Saharo-Sahel and the mixed farming systems in the southern Sudano-Sahel exemplify this. In principle, national production levels have been sufficient to keep pace with staple food demands (see FEWS NET reports). These potentials do not consider food supply-demand asymmetries between areas, different shocks or the concern that there is little room for expanding the agricultural system.

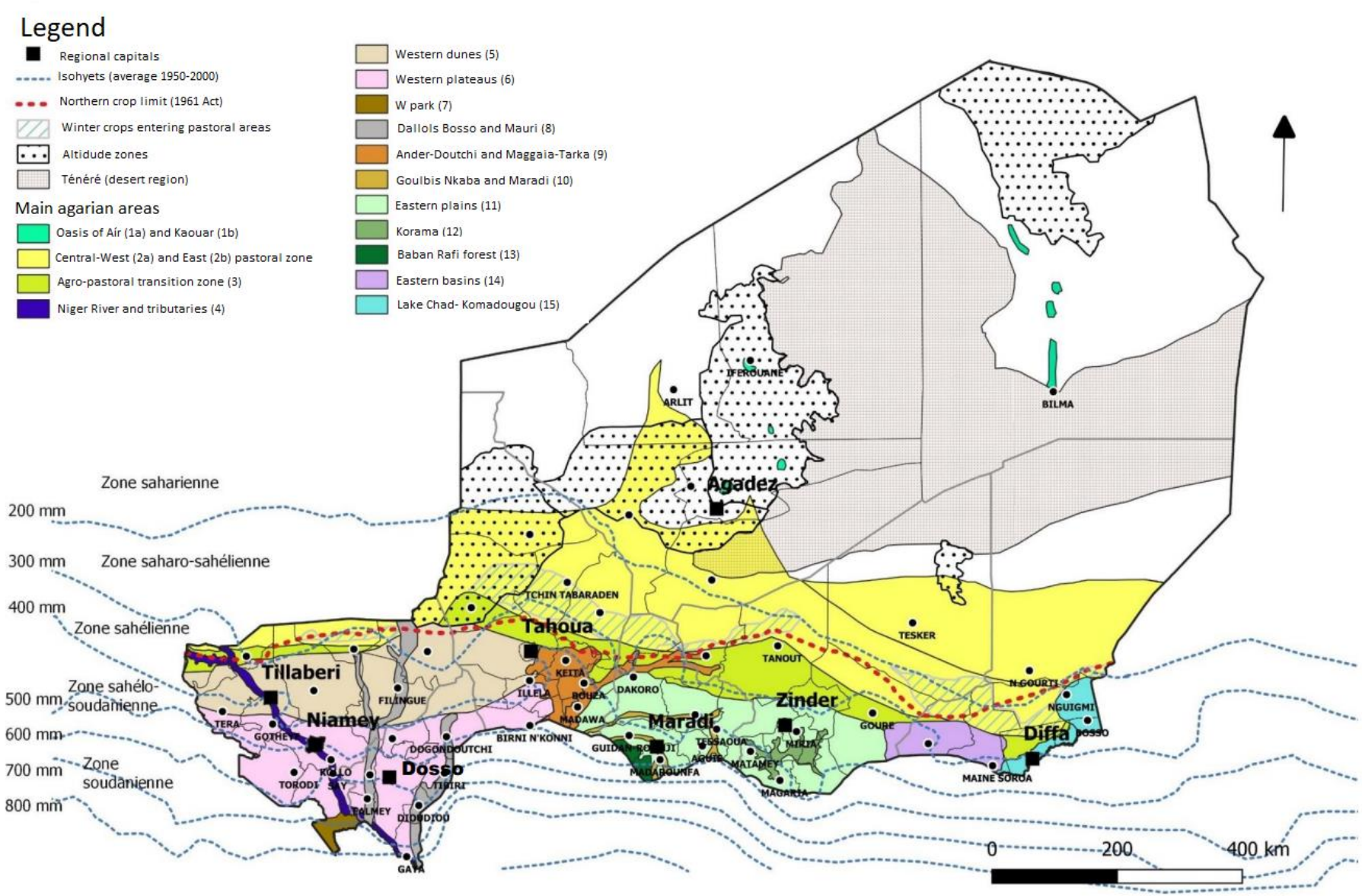

Figure 2 *Agroecological and climatic zones in Niger*
Source: République du Niger, 2020.

3.7 Livelihoods and agri-food systems

According to FEWS NET studies (2011), Niger has 13 rural livelihoods zones. These are broadly covered by three agri-food systems: (rainfed) grains and legumes-based, agro-pastoralist and pastoralist based, and irrigated (horticulture), see Figure 3 (cf. De Steenhuijsen-Piters & Nelen, 2021). The latter is related to specific systems scattered all over Niger, which combine crops or livestock with vegetables and fruits; Niger is a major producer of onions. Irrigated rice is emerging. Despite big investments, Niger has limited potential for rice compared to other products. Livestock, millet and sorghum, legumes and vegetables are its key agricultural products (also see Chapter 6).

3.8 Land management in Niger

Demographic pressure, urbanisation and soil degradation have begun to affect suitable farmland in Niger. Being a core requirement for agriculture, land management is at the heart of agropastoral discussions in Niger. However, access to land is a fundamental challenge. In Niger, males head the households and own 95% of the land. Family members work on collective plots, however, these 'gandus' are reaching their maximum size in many localities, and they can no longer expand without encroaching on neighbouring fields. Land tenure is therefore in a state of flux due to the gradual decrease in land availability and the population is growing (FAO, 2022).

3.9 Niger's Rural Code

The Rural Code is a key element of Niger's national policy on rural land tenure and natural resource management. The code is built on a legal and institutionalised system, which applies at different geographical scales (RECA, 2012). The Rural Code recognises different rights, common resource pools and livestock mobility. However, practices do not often adhere to legislation (Posthumus et al., 2019). Due to the co-existence of multiple land tenure systems, national laws and customary land practices, frequent confusion and tensions over rights and responsibilities are experienced. This also hampers access to funding. Moreover, land pressure has led to increased competition and conflict between actors for control and land use, especially in pastoral lands that never received the same protection as agricultural lands (Posthumus et al., 2019).

3.10 Conflict

Niger's three main agri-food systems are increasingly competing for the same land and water resources, and this has contributed to local outbursts of violence (Posthumus et al., 2019). The source of conflict lies in uneven demographic-economic growth and agriculture-biased policy enforcement, leading to the blockage or narrowing of range lands and transhumant routes by farmers in agro-pastoral areas (UNOWAS, 2018). This encroachment is exacerbated by large private land and water acquisitions, mostly by urban elites (Hilhorst and Nelen, 2011). Moreover, in periods of even greater scarcity, in the northern areas of Niger, due to climate events or insecurity, pastoralists tend to migrate southwards into agricultural areas before harvest periods. In some instances, this leads to crop destruction when transhumance routes or grazing lands are insufficient (UNOWAS, 2018).

Violent conflict is usually at a low level throughout Niger. However, following the Libyan war in 2011, the military coup in 2023 and terrorism in Mali and Nigeria, spillover effects and civil insecurity are common along Niger's borders (UNOWAS, 2018; World Bank, 2023a). Militant groups in these areas have drawn on local support, and this has created two major zones of insurgent violence that affect pastoralists: the south-western and south-east parts of Niger, and around the Lake Chad Basin. The lake is a vital area for pastoralism, farming and fishing but the combination of insurgency and governmental restrictions has severely affected food security in the area (UNOWAS, 2018).

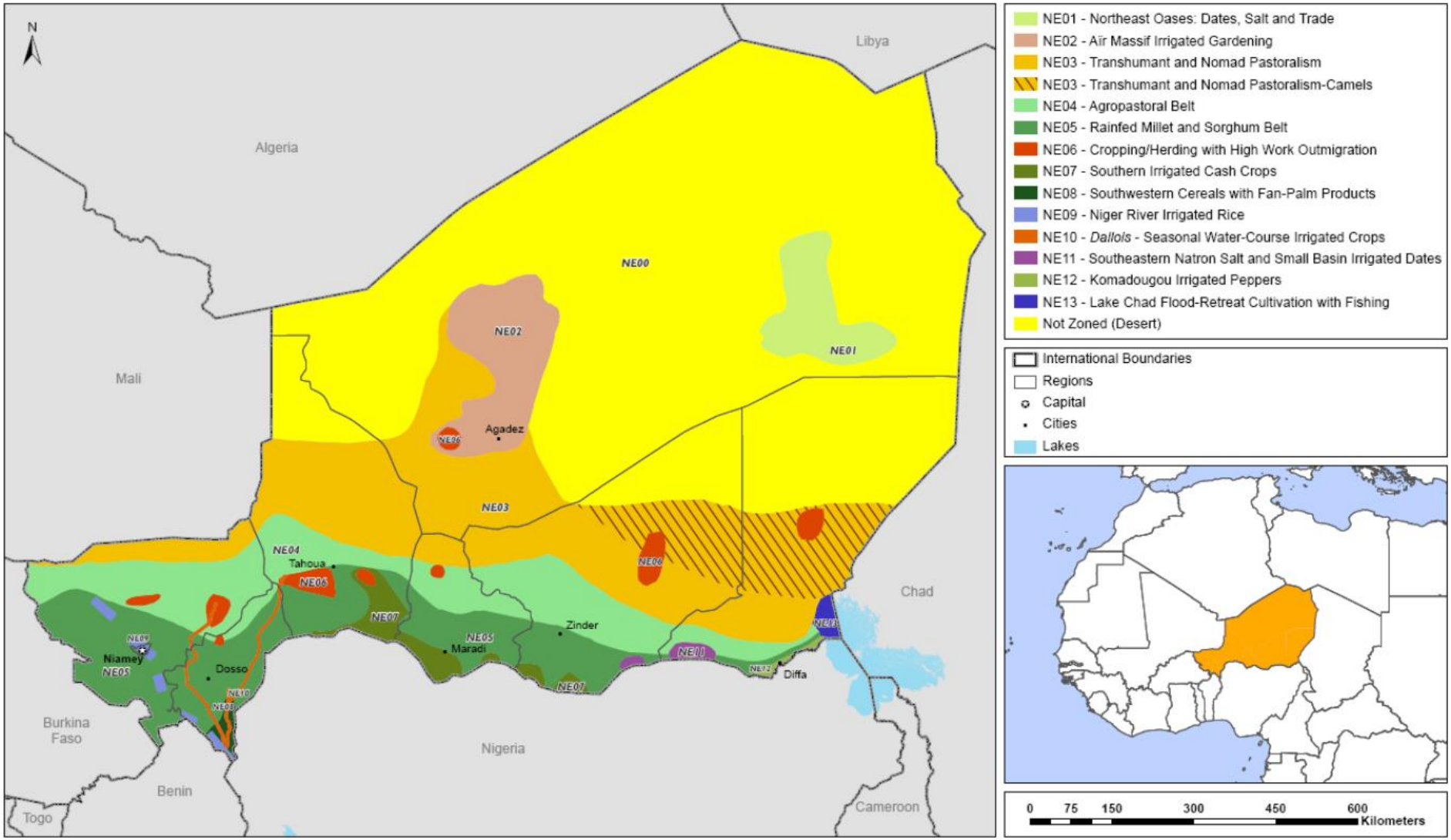

Figure 3 *Map of Niger's national livelihood zones*
Source: FEWS NET, 2011.

4 Food system outcomes

To obtain an overview of the current state of the food system, it is important to understand what the food system currently delivers. Food systems produce a variety of results, which we refer to as 'outcomes'. Food system outcomes can be classified into three main areas: ensuring food security and optimal nutrition for everyone; meeting socio-economic goals, particularly with regard to reducing poverty and inequalities; and making it possible to meet food needs within the boundaries of the planetary environment and climate. Overall, it is recognised that food systems need to function while being resilient to shocks, sustainable over the long-term and equitable in terms of their costs and benefits to different groups in society. Of these food system outcomes and properties, there are inevitable trade-offs and synergies. These create the potential for both conflict and collaboration between different interest groups. This chapter provides an overview of the status of Nigerien food systems outcomes.

4.1 Food and nutrition security

The Sahel region has steadily improved its ability to handle severe food shortages by improving its monitoring and collaboration. Nevertheless, chronic food insecurity prevails in Niger. While Niger produces enough grain overall, this does not reflect how food is distributed within households. For example, imbalances in favour of older men can occur, as can impeding factors such as local availability of food, affordability and market access. Consequently, Niger heavily relies on food imports.

In Niger, the various livelihood zones can be affiliated with high risk for food insecurity (see Figure 3 in the previous chapter). High risk zones lack diverse livelihood options and face unpredictable rainfall. Medium risk areas have better access to irrigation and water sources, allowing for diversification and year-round farming. Low risk zones benefit from trade routes, consistent rainfall and profitable crops. (FEWS NET, 2014).

Despite improvements in socio-economic development, Niger faces many nutritional challenges, especially amongst young children. In 2017, 42% of children under the age of five suffered from chronic malnutrition, and 10.3% were acutely malnourished (WFP, 2023). While undernourishment decreased from 22.5% in 2000/2002 to 11% in 2017/2019, it rose to 19.8% in 2019/2021, (Figure 4) (PNIN, 2022). This increase can be attributed to several drivers, including increased political instability, increased climatic shocks and decreased intensity of humanitarian programmes (e.g. the Poverty Reduction Strategy) (PNIN, 2022). The annual costs associated with child undernutrition in Niger have been estimated at 289.7 billion CFA Francs, 7.1% of Niger's GDP (COHA, Niger 2018).

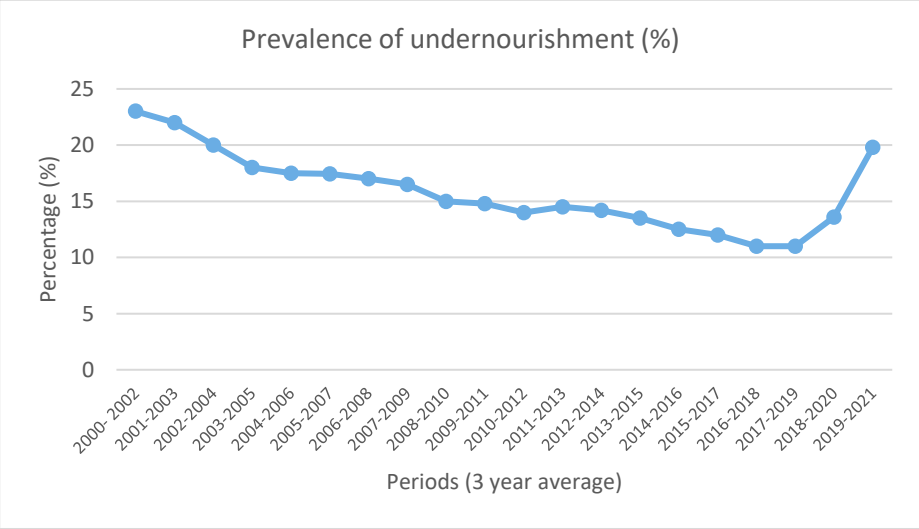

Figure 4 *National evolution of the prevalence of undernourishment from 2000–2002 to 2019–2021*
Source: PNIN, 2022.

In 2017, over half of Niger's rural population (53.1%) faced food insecurity, with 2.6% experiencing severe food insecurity, up from 1.1% in 2015 (RECA Niger, 2017b). The proportion of people at risk of food insecurity also increased, from 25.8% in 2015 to 32.4% in 2017 (Figure 5) (RECA Niger, 2017b). Overweight and obesity are also on the rise, increasing from 18.2% in 2000 to 29.7% in 2016, with females having higher obesity rates than males (Global Nutrition Report, 2018).

The prevalence of stunting amongst children under five has fluctuated over the last decades, but it has remained fairly constant, hovering around 47% in 2022 (Figure 6). In comparison, wasting levels have significantly decreased, from 29% in the 1990s to 12% in 2021. However, these rates are higher than the average for West Africa (Food Systems dashboard, 2021; PNIN, 2022).

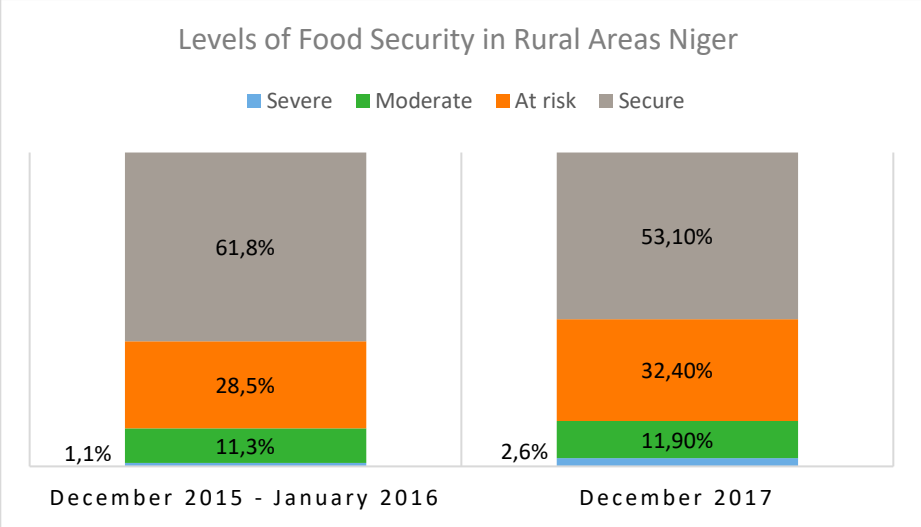

Figure 5 *Food insecurity in rural areas of Niger. January 2016 to December 2017*
Source: RECA Niger, 2017b.

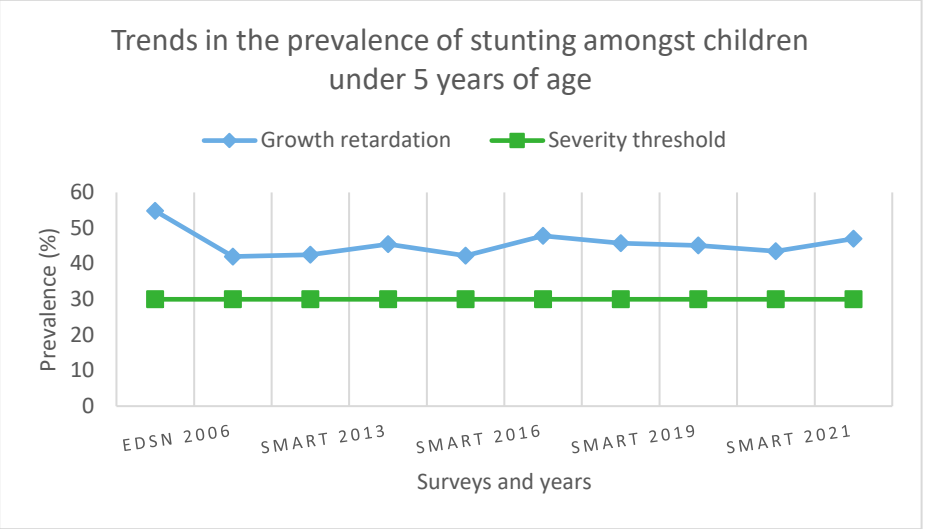

Figure 6 *Evolution of the prevalence of stunting in children under five from 2006 to 2022*
Source: PNIN, 2022.

4.1.1 Food utilisation

Niger's diet is largely based on cereals, mainly millet and sorghum, with some starchy roots. In rural areas, the diet is complemented with pulses. In urban areas, it is complemented with vegetables more often. The consumption of foods of animal origin and of fruit and vegetables, and foods that are rich in micronutrients is low (WUR, n.d.). Table 1 illustrates the general trend in the share of energy intake of food throughout Niger's population. The share of energy intake from roots and tubers, oilseeds, fruit, meat and offal, and vegetable oils have increased from 1992–2014, with roots and tubers and oilseeds seeing the largest increase. Comparatively, the share of the energy intake from cereals and pulses has decreased (FAOSTAT, 2014; PNIN, 2022).

Table 1 *Evolution (%) of the share of energy intake from food consumed by the population between 1992 and 2014*

FOOD	1992	2002	2014
Cereals (%)	74.2	66.1	60.8
Pulses (%)	2.4	1.9	1.6
Roots and tubers (%)	5.6	9.1	11.5
Nuts (%)	0.5	0.1	0
Oilseeds (%)	0.8	2.5	6.1
Vegetables (%)	1.4	2	1.6
Fruit - wine excluded (%)	0.7	0.9	1.9
Meat and offal (%)	3.9	4.5	4.4
Vegetable oils and animal fats (%)	4.2	6.1	5.6
Fish, seafood and aquatic products (%)	0	0	0.2
Milk - butter excluded (%)	3.7	3.7	3.7
Eggs (%)	0.1	0	0

Source: FAOSTAT, 2014; PNIN, 2022.

Overweight levels increased from 18.2% in 2000 to 29.7% in 2016, whereby females have higher obesity rates when compared to males (Global Nutrition Report, 2018). Prevalence of overweight is increasing due to the increased availability of cheap, processed foods with high proportions of fat and sugars. Women who live in rural areas are 3.4% less likely to be overweight than those who live in urban areas due to the lower availability of energy dense processed foods and greater physical activity (Institute national de la statistique Niger, 2020).

4.1.2 Food availability

Despite a steady increase in the availability of caloric intake per person per day (2,127 kcal/pc/d), the average availability of calories remains well below the vulnerability threshold for chronic malnutrition (2,800 kcal) (Figure 7) (FAOSTAT, 2022). If this trend continues, projections computed by the INS indicate that the threshold of vulnerability to chronic malnutrition would only be reached in 2028 (PNiN, 2022).

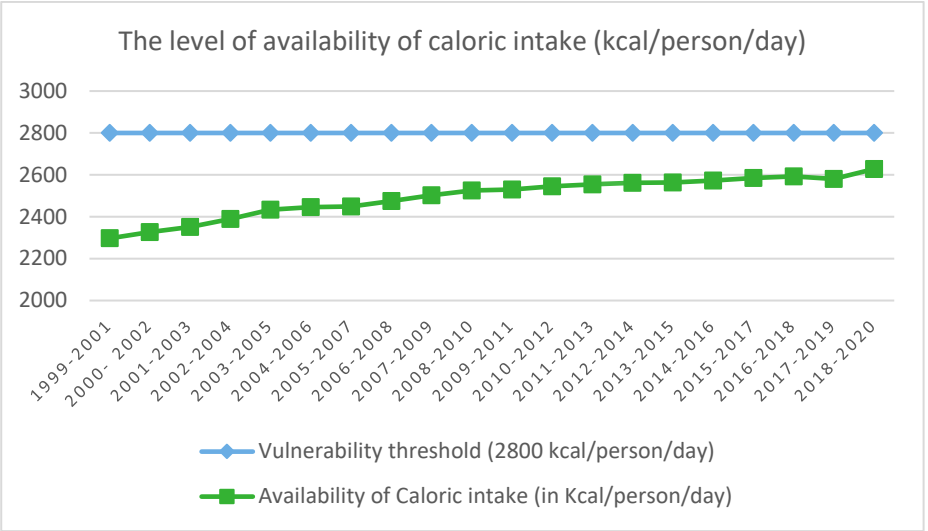

Figure 7 *Evolution of the level of availability of caloric intake (kcal/ person/ day) from 1999–2001 to 2018–2020*
Source: FAOSTAT, 2022; PNiN, 2022.

4.1.3 Food accessibility

Most Nigeriens are dependent on rain-fed agriculture for their livelihoods. Frequent droughts and low and variable rainfall reduce their access to food, leading to frequent food shortages in the country. Access to affordable and nutritious food is limited. Despite this, nearly all households have sufficient financial resources to access a diet that meets their energy consumption needs. A significant proportion of the population are unable to afford a nutritious and diverse diet, which costs twice as much as the average food expenditure (Karkare & Van Seters, 2021).

Similar to other Sahelian countries, Niger is below the 50% threshold for the share of calories obtained from foods other than staple foods, representing the least dietary diversity in the general population. This has only increased by 9% over the last 20 years (Figure 8). This trend has been accompanied by a growth in the contribution of energy from legumes (mainly cowpea), which doubled between 1992 and 2014 (PNiN, 2022).

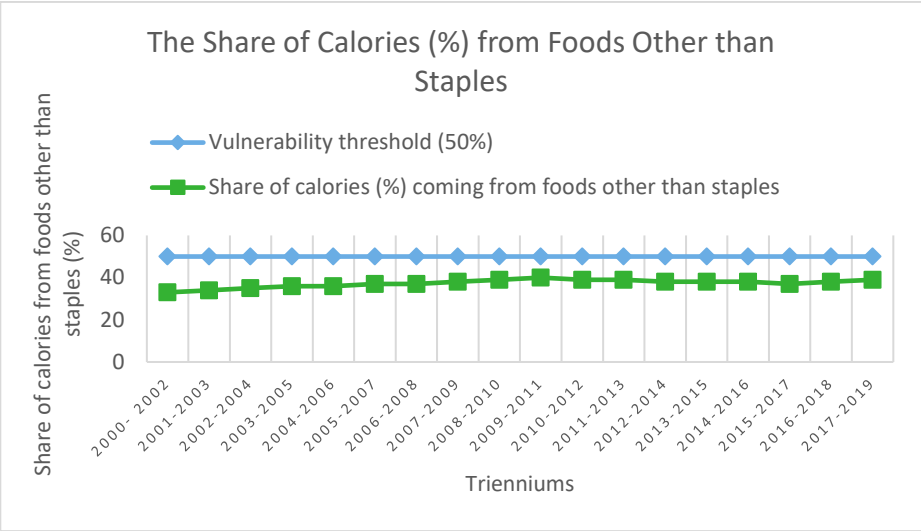

Figure 8 *Evolution of the share of calories (%) coming from foods other than staples, from 2000-2002 to 2017-2019*
Source: FAOSTAT, 2022; PNiN, 2022.

4.2 Economic and social wellbeing

The GDP growth in Niger dropped to 1.4% in 2021 (World Bank, 2022a). However, it rose to 7.2% in 2022 and was projected to reach 6.9% in 2023 thanks to agriculture and large scale oil production (Figure 9) (ADB, 2023; World Bank, 2023b). The value added to the GDP from agriculture forestry and fishing has followed a downward trend since the 1960s, dropping from 75.3% to 32.4% in 2015. Since then, however, it has increased, reaching 42% in 2022 (World Bank, 2022b). A breakdown of the structure and economic contribution of Niger's agri-food system can be seen in Figure 10. Figure 10 illustrates that, as a low-income country (LIC), Niger's on farm-component and its contribution to the national GDP are larger than other LICs, while the off-farm component is somewhat smaller in size. Interestingly, Niger's off-farm components are comparable to other LICs (Diao et al., 2023). It is important to note that the coup has significantly affected GDP growth. The ECOWAS trade sanctions and border closures will drastically reduce imports and exports. In combination with this, pauses in financing from international development are expected to reduce GDP growth to just 2.3% (World Bank, 2023b). Without political stability, Niger's future is uncertain.

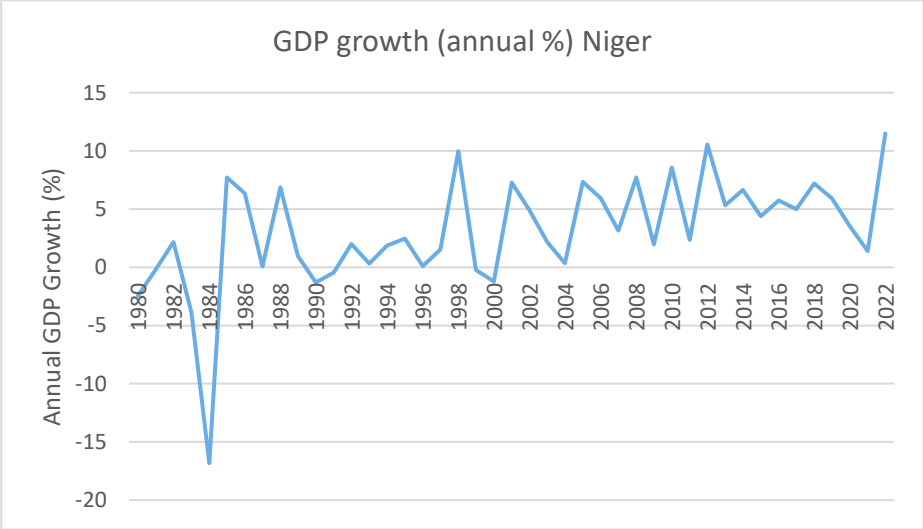

Figure 9 *Annual GDP growth Niger*
Source: World Bank, 2022a.

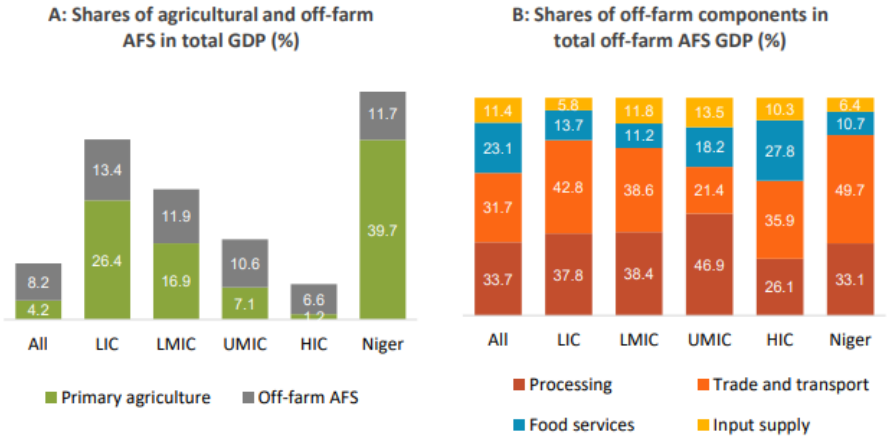

Figure 10 *Comparing Niger's agri-food system to other countries*
Note: LIC = low-income country; LMIC = lower-middle-income country; UMIC = upper-middle-income country; HIC = high-income country
Source: IFPRI's Agrifood System Database (Thurlow et al., 2023) and the 2019 Social Accounting Matrix for Niger (IFPRI 2023b), Retrieved form Diao et al., 2023.

In terms of employment, more than 20% of the population depend on the mining sector as a source of livelihood (ECA, n.d.). In comparison, employment in the agricultural sector remains at a significantly higher rate, only decreasing from 78% in 1991 to 71% of the total workforce in 2021 (World Bank, 2021c). More nuance about figures should be provided: members of rural households derive their income from several sub-sectors and in different seasons. Further, most jobs are in the informal sector. This is true for farming and livestock keeping in rural households (over 90%), and informal sector services, which employ over 70% of the off-farm workforce (Catalystas, 2019).

Although poverty rates have rapidly declined over the last decades, a significant proportion of the population still lives below the poverty line (Figure 11). Poverty rates decreased from 91.7% of the population living below US$ 3.20 a day to in 2002 to 62.7% in 2021. However the percentage of people living below US$1.90 a day followed a more rapid downwards trend, from 76.8% in 2002 to 28.7% in 2021 (Global Nutrition Report, 2021). Agriculture has been one of the main drivers in reducing poverty rates (FAO, Union Européenne & Cirad, 2023). Niger ranks 189th out of 189 countries on the UN Human Development Index (UNDP, 2020).

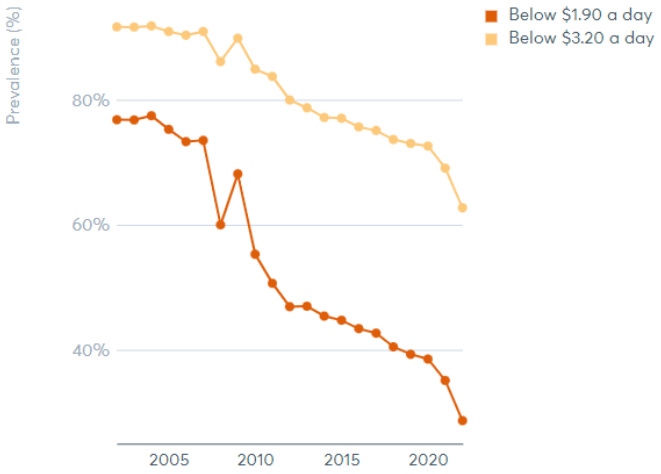

Figure 11 *Poverty rates in Niger*
Source: Global Nutrition Report, 2021.

4.3 Environmental sustainability

High population growth and the subsequent increased food demand puts pressure on land and resources in Niger. Niger's water availability is also increasingly affected by climate change. This manifests through more variable rainfall and frequent long dry spells. Land degradation is a major issue in Niger. The annual total economic value of land degradation in 2015 was 3.535 billion USD (19% of purchasing power parity GDP) (Ephraim, Yating & Edward, 2018). Crop land expansion accounted for approximately 57% of deforestation (Nkonya et al., 2016). Over the 1975–2013 period, cultivated areas increased from 12.6% in 1975 to 18.1% in 2000 and 24.5% in 2013, causing destruction of savannas and shrub (Figure 12). Agriculture expansion has mostly occurred in the Tillabéri

region, which is characterised by sandy soils, where cropland is now encroaching on traditional pastoral lands (Sule & Odekunle, 2016). In 1989, Niger's productive potential of forest was estimated at 16 million ha and the forest area at 10.5 million ha. However, 50% of forest area was lost between 1958 and 1997 due to agriculture, firewood collection and urban development (République du Niger, 2020). The exploitation of forest resources provides 87% of the population's wood energy needs.

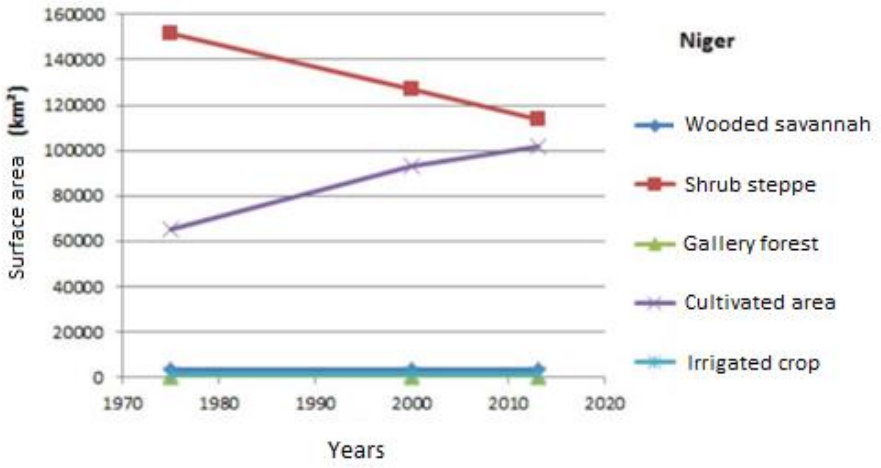

Figure 12 *Evolution of agricultural and pastoral areas in Niger from 1975 to 2013 (km²)*
Source: Sule & Odekunle, 2016.

Land resources are subject to continuous degradation due to agricultural encroachment on range and forest lands and to harsh climate. Agriculture now covers areas that are unsuitable for crop production. Consequently, deforestation and desertification are progressing quickly, reaching 75% of the national territory. This deterioration was enhanced by major droughts in the 1970s and 1980s, which put pressure on the scarce natural resources pastoralists depend upon. Between 1975 and 2013, grazing lands and rangelands decreased by 15% (UICN, 2021). This has placed additional pressure on biodiversity. The pressure on the natural resources and agri-food systems comes from a range of drivers and factors: demography and economic growth, natural resource challenges, land conflicts and climate change.

4.4 Conclusions to Niger's food system outcomes

The diets of Niger's population are mainly based on cereals and deficient in proteins and micro-nutrients. Inadequate diets are the main cause of the high occurrence of stunting among children. Increasing obesity amongst adults indicates important inequalities in terms of access to food. Inadequate diets are caused by important fluctuations in domestic food production and price volatility of imported foods. Low purchasing power makes households less resilient to these shocks, leading to deteriorating food and nutrition security. Among the root causes of food and nutrition insecurity are limitations in natural resources, increasing conflict, high dependency on international food markets and climate change, which has led to declining weather conditions. These food system outcomes will drastically change following the coup in 2023.

5 Food system drivers

Proceeding from the snapshot of what Niger's food system delivers to society provided in the previous section, we can now begin to explore the factors that shape these outcomes. This chapter describes key drivers that shape Niger's food system. Global level drivers of the food systems are described below in the following categories: demographics and development, consumption, technology, markets, climate and environment, policy and geopolitics.

5.1 Demographics and development

5.1.1 Demographics

Niger has one of the highest population growth rates in the world, reaching 3.7% annually in 2022, figure 13 (World Bank, 2022c). Niger's population has more than doubled since 1990 and is expected to triple by 2050 (WUR, 2018). As a result, Niger is witnessing a youth population explosion; more than 50% of the population is below the age of 14. The size of households in Niger has remained at a steady six people since the 1960s, with at least 93% of households having at least one person below the age of 20 years (UN, 2019). Niger has a relatively low urbanisation rate compared to other countries in the region; 18% compared to 24% in Chad and 22% in Mali (Club de Sahel, 2020). Subsequently, the majority (80%) of Niger's population lives in rural areas; Niger has a relatively low population density (< 50 habitants/km^2) with the exception of relatively populated zones (50–150 habitants/km^2) in the agricultural belts of Southern Niger. As a result, more than 75% of the population rely on farming (livestock and agriculture) as a source of livelihood (FEWS NET,2017).

5.1.2 Water infrastructure development

In relation to water and sanitation infrastructure, Niger has made several improvements. There has been an increase in the percentage of the population that use basic drinking water services at least, rising from 37% in 2000 to 47% in 2020. However, currently, 8 million people in Niger do not have access to safe water (World Bank, 2020a).

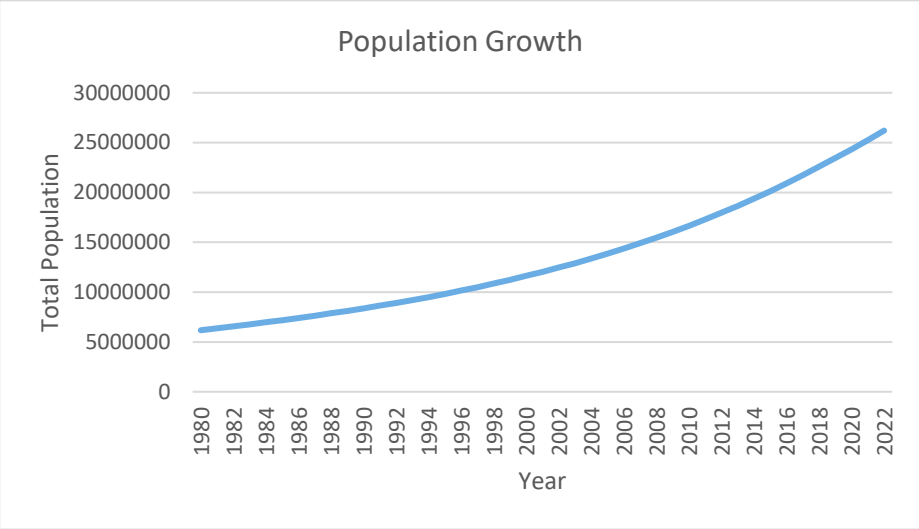

Figure 13 *Trends in population growth – Niger*
Source: World Bank, 2022c.

The percentage of the population that has limited drinking water sources increased from 4.2% in 2000 to 21.7% in 2020. Most people in rural areas rely on groundwater to meet their daily needs. However, while there is sufficient groundwater available, few people can afford to build safe and efficient systems to bring it to the surface. Constraints in ground water arise due to insufficient flow rates and high depths; this results in high exploitation costs and maintenance of infrastructure (République du Niger, 2020). The irrigable land potential of Niger

is estimated at 1.8% of the cultivated area. However, the total area actually equipped for irrigation was 0.62% of the cultivate area as of 2019 (FAO, 2019).

In 2020, only 15% of the population had at least basic sanitation services (6% in 2000) (World Bank, 2020b). The water quality in Niger thus contributes significantly to the disease burden in the country, which in turn negatively affects education and economic growth (WUR, n.d.).

5.1.3 Economic development

Niger's GDP growth has been relatively stable over the last 20 years, averaging at 5.2% between 2000 and 2020. However, due to the rising population, this has been insufficient to create the fundamental change needed to achieve sustained income growth and to reduce poverty (World Bank, n.d.). Although Niger is the fourth biggest producer of uranium, its extraction is concentrated amongst foreign based industries, so it accounts for 70% of the country's exports and only contributes to 5% of the GDP. Mining operations have caused domestic political tensions with few benefits to the national population. Academics and civil society organisations agree that Nigeriens have not benefited from the 100,000 tonnes of uranium extracted over the last 36 years (TNH, 2007). Consequently, Niger's economy has experienced little change and retains many of the same characteristics it had in 2000. Moreover, despite economic growth of 4.9% in 2017 and 7% in 2018, the economy remains poorly diversified, and hugely dependent on the rural sector; agriculture and livestock. According to The World Bank (2021b), the added value from agriculture, forestry and fishing to the GDP decreased from 75.3% in 1960 to 36.5% in 2021. Comparatively, livestock, particularly pastoral, contributed 8.54% of GDP in 2018 (République du Niger, 2020).

The food economy goes beyond strict agriculture, livestock and fishing: at least 40% of the gross value added comes from off-farm activities, mostly found in the informal sector. This figure will only rise with population growth. Despite this, there is little state-supported social security. Food diversity, quality and hygiene are crucial issues in both 'formal' and 'informal' markets. Farmers and traders cope with inefficiencies while having little working capital. There is relatively little information on nor attention being paid to the share and robustness of the informal economy.

In principle, there is free circulation of goods and people in the ECOWAS region. However, this was paused following the 2023 coup. Regional markets are functioning and, despite border tariffs and non-tariff barriers, there is intensive trade between Niger, coastal countries (Nigeria, Benin) and Algeria. The Sahel is traditionally a zone of high mobility and trade. Temporary migration and seasonal work are an important source of livelihoods (see Section 5.2). Pastoralist mobility is hampered in almost all areas. Partly due to population growth and agricultural encroachment that affects access to grazing areas and corridors (see Sections 5.5 and 5.7), but there are also 'anti-pastoralist' policies in coastal countries (Benin and Nigeria), which limit transhumance and cross-border trade. The country's economy is frequently affected by internal and external factors that include climate shocks, political unrest and the spread of violence and conflict.

5.2 Migration and conflict

There are many forms of migration in Niger. The most common are: seasonal, circular migration in rural areas and to cities, transhumance and settlement in agricultural areas, daily cross-border mobility, forced displacement and transit migration. Since the crisis in Libya and Mali in 2011, the number of migrants travelling through Niger has significantly increased (transit migration) including the smuggling network (IOM, 2020). Between 2016 and 2019, 1,055,214 people were observed travelling from (55%) to (29%) and within (16%) Niger (IOM, 2020) (Figure 14).

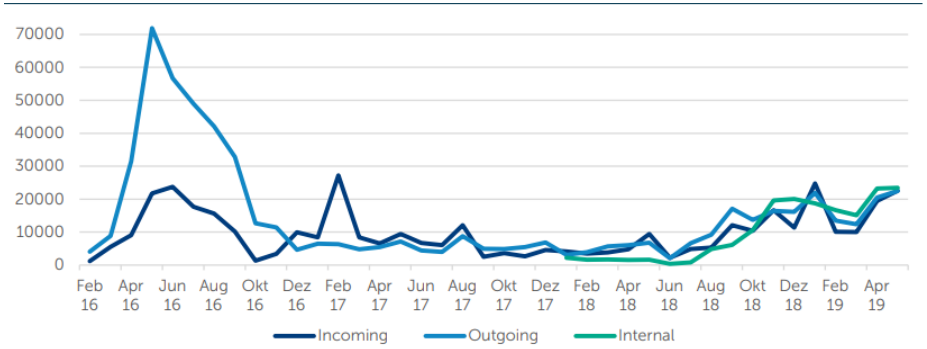

Figure 14 *Transit migration flow through Niger since 2016*
Source: IOM, 2020.

Regional labour has been a fundamental practice in Niger for decades, and it has become a resilience strategy, especially during periods of drought. Cross border movement occurs in areas home to the same communities, such as between Burkina Faso and Niger (Jegen, 2019). Cross-border transhumance is a traditional practice in Niger where herders seasonally migrate with their livestock in search of grazeland. This practice is an important livelihood adaptation strategy that increases herders' resilience to climatic vulnerabilities. However, due to climate change and environmental stress, seasonal migration, and migratory routes have shifted. This creates tensions between farmer and herder communities as both struggle to find suitable pastures or fertile agricultural land.

The Sahel has experienced an expansion and intensification of armed conflict in some areas, causing a surge in internally displaced people, which has increased by approximately 300% in the Tahoua and Tillabery regions (Karkare & Van Seters, 2021). Consequently, many vulnerable populations are unable to access their lands, wiping out livelihoods and food sources, placing communities at risk and forcing many to become dependent on external aid (CiCR, 2022).

5.3 Consumption

Diets are poorly diversified, consisting predominantly of cereals and containing little food of animal origins, fruit or vegetables. This pattern is partly due to insufficient knowledge about good dietary practices. Additionally, low food availability and the associated high price of certain foods (including fish, meat, fruit), in combination with poverty and low purchasing power further amplifies low dietary diversity (PNiN, 2020). Socio-cultural factors affect young child feeding practices as many women in Niger have low education and levels of empowerment, hindering access to land, water and agricultural input (PNiN, 2020). In some regions such as Maradi, family meals are often shared, and food is sometimes circulated within social networks to mitigate the risks of food shortages. During periods of low food availability, the water content of food increases. In Niamey, the growing population and its socio-economic development have created a growing demand for food, which is evolving from traditional consumption habits, diverging from the norm in rural areas (see *Section* 4.1.1, Table 1) (PNiN, 2020).

5.4 Technology

The research and technology infrastructure in Niger is relatively poor and dependent on donor funding (Posthumus et al., 2019). Fertiliser use in Niger (3 kg/ha/year) is far below the continental average of 12 kg/ha/year and does not enable sufficient agricultural production to adequately provide for the country's food needs. Compared to neighbouring countries, the fertiliser market in Niger is very small (30,000 metric tons per year) compared to Burkina Faso (250,000 metric tons per year). In response to this, Niger's government has committed to a process of reforming the fertiliser sector. The reform aims to improve the availability and access of quality fertilisers to producers in all regions of Niger (RECA Niger, 2018).

In terms of irrigation, surface irrigation is the most well established irrigation system in Niger. However, since the 2000s there has been an increase in solar powered drip irrigation, while sprinkler irrigation remains low (Adamou, et al., 2021). Research into drought tolerant crops is underway, especially into millet as

it accounts for 63% of the cereals planted (Adamou, et al., 2021). Land restoration and management are also practiced in Niger. There are a variety of techniques used. *Zai* (a Sahelian agricultural technique where holes are sown to naturally accumulate water from runoff) and mulching are the most effective practice for increasing productivity while simultaneously increasing resilience to climate change (Issoufou et al., 2020).

Models for the intensification of agropastoral farms have been developed that use a micro-project approach to introduce technological progress. Their implementation depends on favourable conditions to extend the models according to the potential of each of Niger's ecological zones (RECA Niger, 2010). Several initiatives contribute to the advancement of livestock practices. For example, Vétérinaires Sans Frontières have established a mobile hotline for transhumant pastoralists to search for information (VSF, n.d.).

5.5 Land use, climate and environment

The pressure on the production systems comes from a range of drivers and factors that include demographics, climate change, competition and conflicts over scarce resources. Policy and institutional conditions also determine production (e.g. adapted or non-adapted input supply, access to finance, state infrastructure). Although climate change is eminent, land use and degradation (see Chapter 3) can only be understood by emphasising the long-term, net expansion of agricultural areas.

In the Sahara and Sahel, agriculture encroaches on livestock areas, even where the agroclimatic conditions hardly allow for agriculture. The areas are also affected by land and water acquisitions for ranching. Pastoralism is under pressure: the exploitation of theoretically productive pastures in the rainy season can only take place thanks to the existence of refuge areas in the dry season (Grain de Sel, 2017; Hesse et al., 2013). Most of these areas can be found in river valleys and southern rangelands, typically coveted by farmers and land speculators.

In the Soudano-Sahel zones, large agricultural areas have become 'saturated' by demographic and economic growth. High pressure on cultivated lands shows two different pictures. First, there is a general tendency of land degradation; the felling of trees, decreasing soil fertility, degradation of grass pastures and erosion. In this, cultivation is no longer compensated by reserves (fallows, forest-rangelands) for regenerating soils, trees and grasses. The forest-rangelands have diminished or are degraded too, which affects wood and non-timber forest products. At the same time, we find areas genuine effort being put into land and water conservation – including regreening – sometimes combined with adapted inputs (new seeds, fertilisers) (Grain de Sel, 2017; Hesse et al., 2013). Fragmentation of plots into smaller units is also an issue in all areas. Finally, due to high insecurity and conflict, the use of agricultural and range-lands has recently been reduced in border zones with Burkina Faso, Mali, Nigeria and Chad.

Oases are prevalent across Niger's vast arid land areas, and they are used as hotspots for intensive cultivated agricultural production. However, in recent years, major oasis crops have begun to decline due to several factors. These include the growing popularity of small traditional family farms, limited land accessibility and minimal mechanisation and access to agricultural inputs (Chaibou & Bonnet, n.d.).

Land degradation is exacerbated by climate change. Climate projections indicate that Niger's population will have to adapt to climatic changes by 2050 as a result of a significant increase in temperatures between 1.5 and 3°C. This rise in temperatures will lead to a greater frequency of extreme climatic events that negatively affect production yields, which are expected to reduce by 10–20% (Figure 15) (République du Niger, 2020).

Niger experiences low and variable rainfall, land degradation, deforestation and desertification. Rainy seasons are shortening. However, when it does rain, it frequently occurs in the form of violent storms that result in intense run-off, which exceed the soil's infiltration capacity. The combination of these factors, in addition to increased climatic stress and the occurrence of extreme events, has led to a population who depend on agriculture to support their livelihoods becoming increasingly vulnerable. Recurrent and severe droughts (e.g. in 2001, 2005, 2009 and 2011) have had disastrous consequences on agropastoral production and created food insecurity for millions of people. Floods are also a frequent phenomenon, with at least six floods recorded between 1963 and 2012 (République du Niger, 2020). These events have historically led to poor harvests and famines dating back to the beginning of the 1900s (Garenne, 2021).

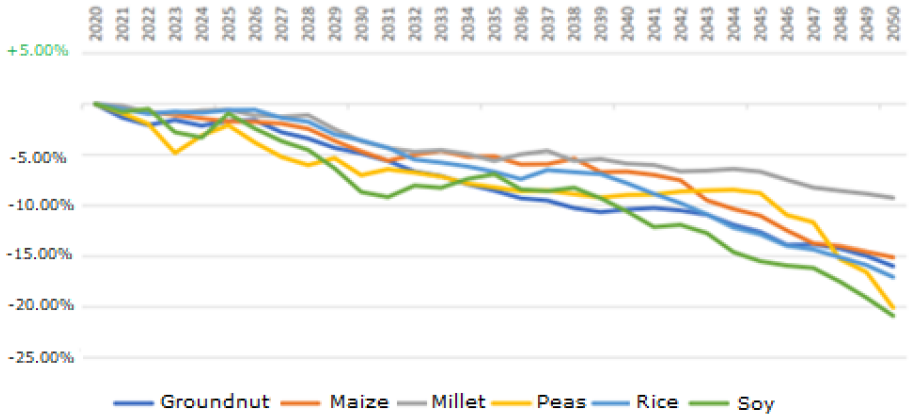

Figure 15 *Simulated impact of climate change on rainfed crop yields in Niger (base 2020)*
Source: République du Niger, 2020. IFAD.

As only 15% of the land is arable, agricultural productivity – which is already low by global standards – is anticipated to fall even further due to the effects of climate change (WUR, n.d.). Additionally, the impacts of climate change on livestock are widespread. Decreasing precipitation renders animal fodder unavailable. This causes price inflation and impacts animal health, threatening the national economy, placing pressure on pastoral ecosystems and threatening livelihoods (UNDP, 2023).

5.6 Policy and geopolitics

In response to continual fluctuations in Niger's food systems and deteriorating food security outcomes, Niger has introduced a myriad of policies that aim to stabilise agricultural production, food security and their associated drivers. Examples include the introduction of the concept Maison du Paysan by the 3N initiative. Maison du Paysan aims to improve the availability of and access to the elements needed to produce and promote the use of contextualised and innovative technology (HC3N-MAG/EL, 2019). Essentially, the Maison du Paysan anchors the I3N at the community level.

Niger has also recognised how conditions surrounding national agroecosystems are changing due to population growth and climate change. Consequently, Niger has begun a transition to climate-smart agriculture and initiated a plan of action for livestock. Accordingly, the National Strategy and Plan for Adaptation to Climate Change in the Agricultural Sector (SPN2A) and the National Adaptation Plan for Climatic Changes 2022 have been developed (Republique Du Niger, 2022; Republique Du Niger, 2020). Niger's Ministry of Planning also developed the Sustainable Development Strategy and Inclusive Growth for 2035, which includes strategic guidelines on the modernisation and revitalisation of agro-pastoral systems and the rural economy (Ministère du Plan, 2017).

In terms of geopolitics, the severe security crises faced by Niger have resulted in fragile ties with its neighbouring countries: Nigeria, Mail and Burkina Faso. This is because violent groups carry out attacks on security forces and civilians (World Bank, 2023a).

5.7 Land tenure

Due to strong demographic pressures, urbanisation and soil degradation, access to land is a fundamental issue for all livelihoods and all levels of society. Rising pressure and higher land values undermine customary tenure regimes. This poses the risk of reducing widespread access and property rights to ownership and titles. The commons (forest-range lands) face an uncertain fate. They are exposed to land acquisitions, even in pastoral areas; there are few sanctions against land speculation. Secondary rights' holders – pastoralists and migrants – risk being excluded from key resources. In Niger, 95% of the total area intended for agricultural production is owned by male heads of household, while female heads of household only account for 5%. Land tenure is changing rapidly and women are primarily affected (FAO, 2022).

The central state's struggle to manage and protect resources has been a constant factor over the past six decades. In the 1960 and 1980s the Niger state replaced customary authorities in natural resources management, mainly with forestry agencies, without having the necessary legitimacy and means. The 'Rural Code' (1990s) and decentralisation (2000s) policies offered an opportunity to give a new role to local management and customary rules. The Rural Code is a key element

of Niger's national policy on rural land tenure and natural resource management. The code rests on legal and institutionalised systems that apply at different geographical scales (RECA, 2012). The Rural Code recognises different rights, common pool resources and livestock mobility. However, practices do not often adhere to legislation (Posthumus et al., 2019).

Due to the co-existence of two land tenure systems – national laws and customary land practices – confusion and tensions over rights and responsibilities are common and access to funding is hampered. Moreover, land pressure has led to increased competition and conflict between actors for control and land use, especially in pastoral lands that never received the same protection as agricultural lands (Posthumus et al., 2019). Furthermore, customary authorities have changed; some re-created political space while others lost legitimacy. Recent events in conflict areas have undermined state authority to a degree where local militia and extremist groups intervene in civil protection and repression directly, as well in settling disputes about land and water access.

5.8 The COVID-19 pandemic

COVID-19 was another shock that led to an increase in the number food insecure people in Niger. Curfews and movement restrictions prevented poor urban households from engaging in informal work, which usually provided their main source of income to buy food (FEWS NET, 2020). Moreover, restrictions on the use of public transport and food markets caused significant reductions in terms of food accessibility, including reduced supplies of fresh vegetables to Niamey. A lack of labour and reduced access to inputs hampered the production of off-season crops (Karkare & Van Seters, 2021). Niger's national authorities implemented measures to counter the spread of the virus and to mitigate the socio-economic impacts. These were valued at 1,439.5 billion CFA Francs.

Food shortages and escalating violence drove inflation from -2.5% in 2019 to 3.4% in 2020. (World Bank, 2021). Additionally, the country experienced severe floods in August and September 2020, causing incomes to further deteriorate, falling by 20–35% in Niamey (FEWS NET, 2020). The floods in combination with the effects of COVID-19 caused significant damage, triggering a humanitarian crisis that affected around 6,000 households and led to approximately US$90 million losses within the agricultural sector (World Bank, 2021).

5.9 Markets and prices

Despite not being greatly affected greatly by the war in Ukraine, Niger faced several shocks simultaneously, including the impacts of COVID-19 and widespread flooding, which caused a 40% decrease in cereal production in 2021. Due to growing instability and violence and neighbouring countries, Niger has faced serious price inflation on the cost of living (Figure 16). However, the increase in prices coincided with the lean period in Niger, during which food prices usually increase due to seasonal food shortages (UNDP, 2022).

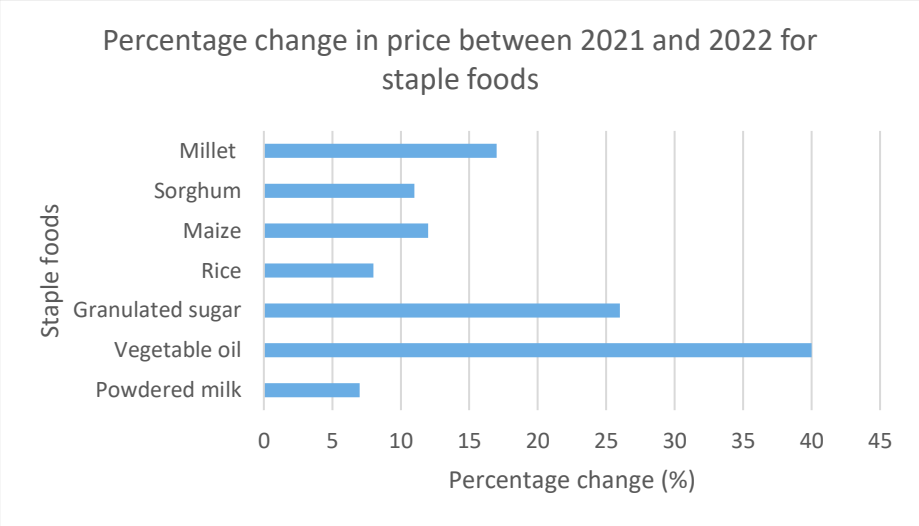

Figure 16 *Percentage change in price between 2021 and 2022 for staple foods in Niger*
Source: UNDP, 2022.

6 Food system structure, actors and activities

This chapter presents the key actors in Niger's food system, the main activities in the value chain and the environment in which they operate. With 80% of the population living in rural areas, the agricultural sector employs over 85% of the labour force and contributes to 30–40% of the national GDP. Niger is the largest producer of cowpea and second largest onion producer in West Africa. In addition to agriculture, rearing livestock is an important livelihood aspect: 63% of the population raise livestock. Niger has a negative food trade balance; food imports have doubled over the last six years, and they largely consist of cereals, which represent 57% of the monetary food import value. Low income consumers mainly consume millet, with cowpea providing the main source of protein. Middle and upper class consumers typically consume more meat. A summary of the key actors and their activities is provided in Table 2. The food system activities are put into context with a description of the enabling environment in which they take place.

Table 2 *Overview of key food-system activities and some of their main actors*

Production	Processing	Trade	Retail	Consumption
Agriculture • Three farming systems: (1) (small scale) grains-legumes, (2) pastoralism, (3) mixed horticulture/agriculture. The latter has export market production. • Niger is the largest producer of cowpea in West Africa, accounting for 40% of the region's production in 2018 (de Steenhuijsen & Nelen, 2021). **Livelihoods** • More than 75% of the population relies on a combination of agricultural production and livestock ownership for income and food (FEWS NET, 2017). • 63% of farmers raise livestock (goats [43%], poultry [31%], sheep [30%]) (FEWS NET, 2017).	• Food processing is small scale, artisanal and localised, especially for staple foods and meat and milk. • Millet and sorghum processing for flour occurs in village mills or it is converted into flour using a mortar and pestle (Ministere de L'agriculture, 2022). • 88% of rice paddies are processed by village mills (Ministere de L'agriculture, 2022). • Edible oils (groundnut and sesame) are processed using artisanal methods. • Société Oumarou Laouali Gago is the only industrial edible oil processor (for crude palm oil) (FEWS, 2017). • There are few industrial meat processing plants. Most processing is done in informal circuits (Posthumus et al., 2019).	**Marketing** Most food items are traded through informal markets **Import and exports** • Cowpeas, onions and garlic are grown for commercial export to Nigeria and other coastal countries • Export of live cattle and meat represents ≈12% of total exports • Negative food trade balance: food imports increased from 106 (in 1997) to 520 million USD in 2017 while food exports increased from 51 million USD in 1997 to 171 million USD (Karkare & Van Seters, 2021). • Food imports have doubled over the last six years: from 241 billion CFA Francs in 2014 to 492 billion CFA Francs in 2020 (PNiN, 2021). • In 2020, cereals represented 57% of the monetary value of total food imports (PniN, 2021).	• Most food is traded and purchased in informal markets. • Wholesalers and retailers concentrated in urban centers (USAID, 2016). • Food retail sales, especially fresh produce, are heavily weighted towards the traditional retail sites. • Poor cold storage infrastructure contributes to high food losses (PNiN, 2021).	**Low-income consumers** • Millet is a staple. • Cowpea is the main source of protein. • 46% of household income is spent on cereals and edible oils (Diao et al., 2022). **Middle-class and high-end consumers** • Typically consume more meat. • 21% of household income spent on cereals and edible oils (Diao et al., 2022). **Urban consumers** • Higher consumption of chicken and meat. • 6% of household income spent on cereals and edible oils (Diao et al., 2022). **Rural consumers** • Very low consumption of meat (US Departement of Commerce, 2017). • 35% of household income spent on cereals and edible oils (Diao et al., 2022).

6.1 Production

Agricultural production in Niger is dominated by three farming systems:[1]

1. Small-scale, predominantly rainfed production of grains and legumes, carried out by sedentary farmers. Cowpea can be exported to neighbouring countries.
2. Most of the production of meat and dairy is organised in pastoral production systems in which migrating pastoralists rear camels, goats, sheep and cattle, and sell them to local markets and traders.
3. The third production system is mainly located on riverbanks, in valleys and oases. It benefits from irrigation and is focused on horticulture and rice for domestic consumption, marketing and the export of vegetables like onions and peppers.

6.1.1 Crop production

The predominantly rainfed agricultural sector employs most (80–85%) of the labour force and contributes to 30–40% of the national GDP. Sorghum and millet are important staple crops grown among sedentary farmers and agro-pastoralists. They account for 94% of total cereal production in Niger (60% millet and 34% sorghum). Niger is the world's third-largest producer of millet, with produced a forecast of 3,461 tonnes in 2020. Sorghum production also constitutes a large percentage of produced cereal volumes, totalling 1,979 tonnes in 2020. This is comparable to rice production, which equalled to just 21 tonnes in the same year (FAO, 2020). Figure 17 provides an overview of the trends in agricultural production volumes and highlights the fluctuations in yields in previous decades (FAO, Union Européenne & Cirad, 2023). Irrigation is most widely practiced in the Tahoua and Maradi regions, where 20,000 ha of land are currently irrigated and produce mostly onions and tomatoes. This is followed by the Niger Valley, which mostly produces rice, followed by fruits and vegetables.

Most of Niger's crop farming is clustered in the south-centre and southwest of the country, in areas that receive between 300 mm and 600 mm rainfall annually. Consequently, low yields are consistently harvested due to poor productivity (Figure 17) (FAO, Union Européenne & Cirad, 2023).

The popularity of rice as a crop is increasing in Niger. It is currently third in the country in terms of area and production (CARD, 2021), but it still lags behind millet and sorghum. Following the 2008 food crisis, Niger implemented measures to increase rice production throughout the country. This resulted in an increase from approximately 86,000 tonnes in 2008 to 115,585 tonnes in 2018, indicating an average annual growth of 3.5% (Ministere de L'agriculture, 2022). Despite this increase, rice production is only sufficient for 1/6 of the population and constitutes only 2.3% of the average annual volume of cereals produced (Ministere de L'agriculture, 2022). Subsequently, Niger has become dependent on rice imports to feed its growing population (Figure 18) (CARD n.d.).

Although only 2% of the cultivatable area has the potential to be irrigated, current small-scale and developed irrigated agriculture contributes to the economy significantly. Developing irrigation and improving productivity are national priorities. Intercropping is widely practiced in these areas, so most of Niger's agricultural systems are mixed (cereals-legumes or cereals-cereals) (Posthumus et al., 2019).

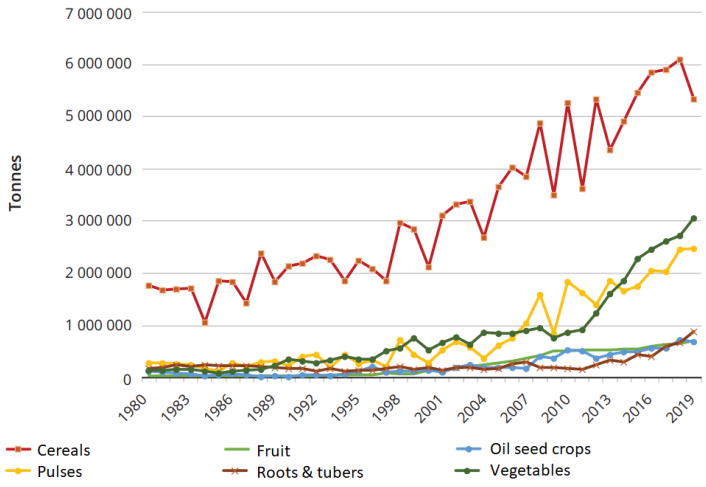

Figure 17 *Production trends for Niger's main cereals and pulses*
Source: FAO, Union Européenne & Cirad, 2023.

[1] See FAO, Union Européenne & Cirad, 2023. for further detail https://doi.org/10.4060/cc6331fr

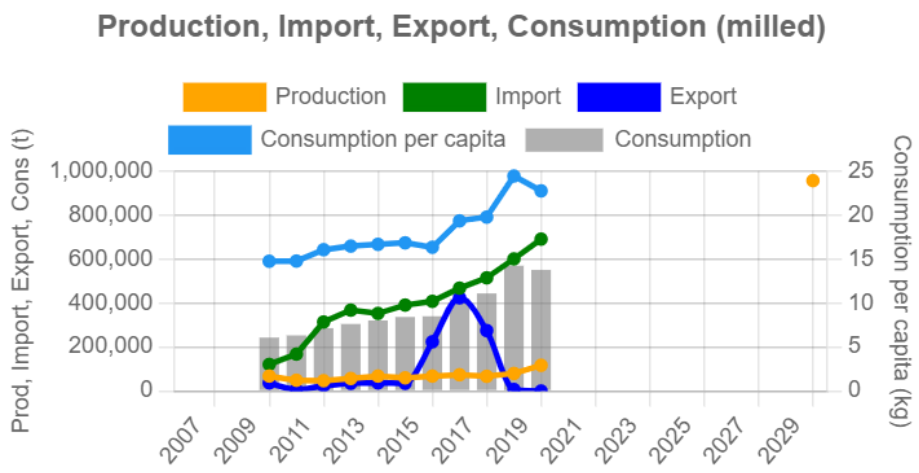

Figure 18 *Comparison of Niger's rice production, consumption, imports and exports*
Source: CARD, n.d.

6.1.2 Oases agriculture

Niger's vast arid areas contain several oases, which are intensively cultivated and use irrigation. The presence of permanent water in the oases enables livestock grazing. Agricultural activities are also carried out, although they are usually confined to fossil valleys and depressions. Examples of these can be found in the Aïr and Kawar in Niger. They are valleys with a shallow water table that receive fresh water from the mountains (Chaibou & Bonnet, n.d.). In Kawar, the wind is continuous and generally blows in the NE-SW direction from the trans-Saharan wind current. It has caused woody species to be removed, as well as the almost complete removal of productive agricultural soils, which has had consequences for the municipality (Moussa et al., 2023).

Located in the heart of Niger's Ténéré desert, 30% of the Fachi oasis is occupied by agricultural potential. However, sand encroachment and salinisation in addition to anthropogenic pressures and declining groundwater levels threaten these high agricultural potential zones. This leads to land use change and has implications for the development and characteristics of the oasis (Moussa et al., 2023). The average area of oasis per farmer in Niger is 0.85 ha, of which 21% of the agricultural production is consumed by households (Chaibou & Bonnet, n.d.). Activities other than agricultural production are also performed in the oasis. For example, in the Djado valley, date collection and salt extraction are very important. Date production in some oases can reach 5,000 tonnes annually. Dates are an important food and are traded by nomads who reside in these vast arid areas in exchange for cereals (Chaibou & Bonnet, n.d.).

6.1.3 Livestock rearing

Livestock is an important source of income for the pastoralist population. Over 75% of Niger's population are involved in livestock farming, which is largely based on extensive mixed crop-livestock and pastoral production systems, which are mostly oriented towards production of meat, local milk and leather goods. In 2017, Niger's livestock was estimated at more than 46 million, with an increase of 26.24% for cattle, 16.96% for goats and 14.75% for sheep between 2013 and 2018 (Figure 19) (République du Niger, 2020). 8.54% of Niger's GDP is dependent on livestock production, including the rearing of camels, goats, sheep and cattle (Posthumus et al., 2019). Moreover, milk contributes to national nutritional status significantly, as approximately 80% of milk is consumed by producer households. As a result, milk production is increasing, with annual fluctuations based on climatic hazards. Currently, milk trade and consumption are seriously hampered by insecurity and instability, which negatively affect mobility. Despite milk accounting for 40% of livestock output, the quantity produced remains insufficient to cover national consumption needs (Aboubacar, 2017).

Due to the agriculture-biased policies and investments, and land degradation, Niger recorded a 15% decline in grazing land during the 1975–2013 period. This is comparable to the 95% increase in cropland in the same period. Livestock systems in Niger are based on mobility. Livestock keepers search for water, pasture resources and markets in short and long transhumance radii that involve northern and southern regions or pass through to coastal countries (UICN, 2021). Owing to interdependence, disruption in one area will have consequences for resource use and pastoralist behaviour in another.

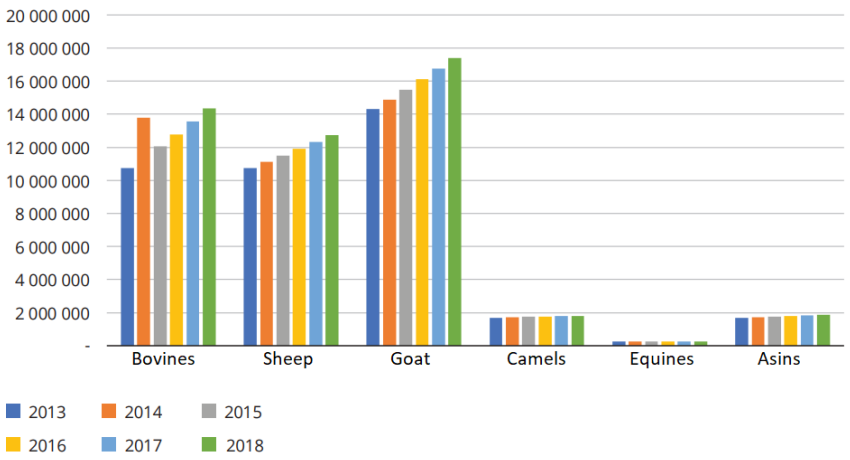

Figure 19 *Trends in livestock count (number of heads)*
Source: FAO, Union Européenne & Cirad, 2023.

6.2 Processing

Agricultural and dairy processing are generally dominated by female entrepreneurs. However, this is relatively uncommon. Due to the remoteness of production areas, seasonal production and the associated high logistical costs, processing rates in Niger are low. Moreover, there is a lack of refrigeration and processing facilities. Despite processors adding the most value to products, they are usually most disadvantaged in terms of commercial margins, especially in the case of the processing of fresh, local milk. This leads formal dairy processors to rely on imported milk powder to manufacture dairy products despite the abundance of livestock (Karkare & Van Seters, 2021). For meat processing, there are few industrial processing plants even though a considerable amount of meat is processed in informal circuits by local butchers. Moreover, most slaughterhouses lack the necessary capacity or do not meet necessary standards (Posthumus et al., 2019).

6.3 Trade

Most food items in Niger are traded through informal markets, in which cash market trading dominates contractual farming. Niger has a negative food trade balance, meaning food imports exceed exports. However, formal trade data on legumes (e.g. cowpea), vegetables (e.g. onions) and especially livestock (cattle) are likely to be too conservative or low because trade relies on long-standing, informal market channels. Local references cannot be extrapolated or aggregated to national levels (De Steenhuijsen Piters and Nelen, 2021). Between 1997 and 2017, food imports increased from 106 to 520 million USD. Although food exports also underwent an increase, they remained relatively low: 51 million USD in 1997 to 171 million USD in 2017 (Figure 20) (Karkare & Van Seters, 2021). This amounts to 6% of total export earnings. Comparatively, extractive mining and petroleum resources provide over 85% of export earnings (FAO, Union Européenne & Cirad, 2023). Niger is a major cattle exporter. The export of live cattle and meat represents almost 12% of total exports (Posthumus et al., 2019).

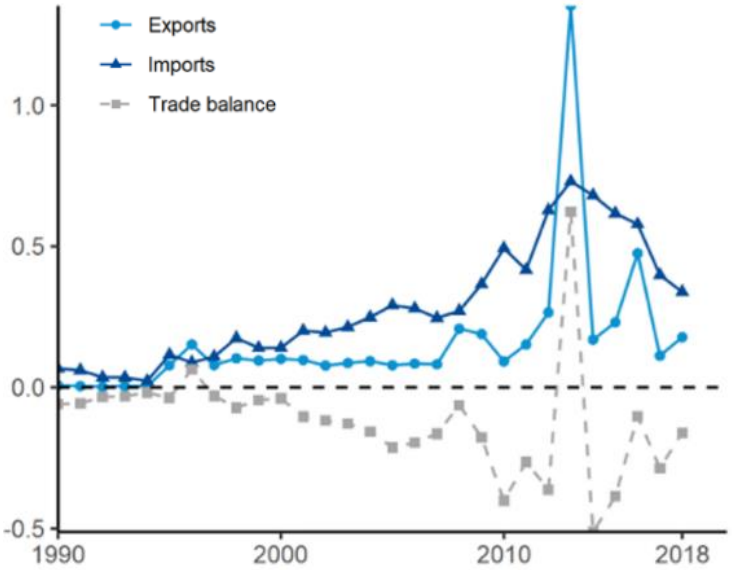

Figure 20 *Niger's food trade balance for agricultural goods (billion USD)*
Source: Karkare & Van Seters, 2021.

In 2020, cereals represented 57% of the monetary value of the total food imports compared to 3.3% for fruits and vegetables (PNiN, 2021). Of the imported cereals, rice constituted the largest share, increasing from 70.5% in 2014 to 85.9% of the monetary value of cereal imports in 2020 (Figure 21) (PNiN, 2021). Niger is heavily dependent on fruit imports, which predominantly made up of fresh and dried dates, figs, pineapples, avocados, guavas, mangos and mangosteens. The monetary value of these grouped import items has followed an increasing trend, growing from 61% in 2014 to 76% in 2020 (Figure 22) (PNiN, 2021).

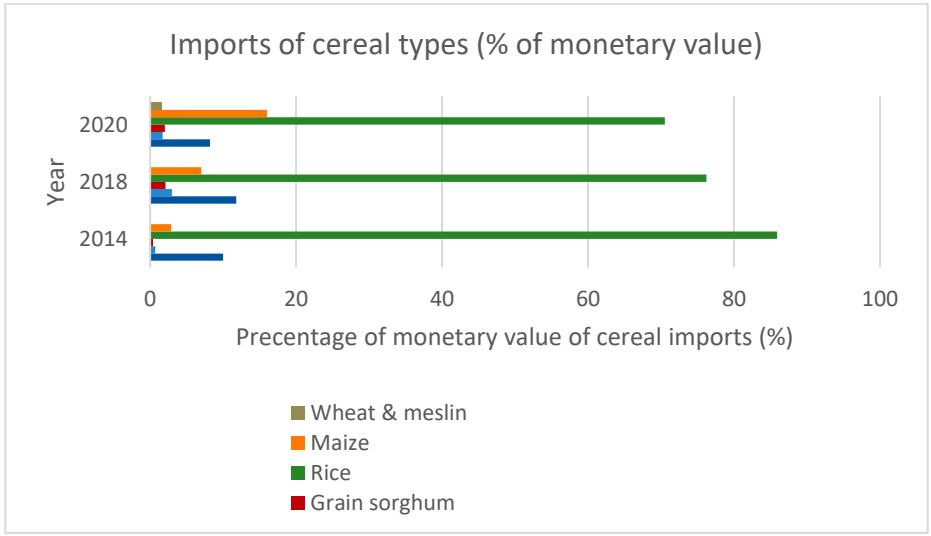

Figure 21 *Imports of different cereals as a percentage of monetary value of cereal imports*
Source: PNiN, 2021.

farm sales, street vendors and open markets. Modern supermarkets and other outlets cannot compete with the efficient traditional, informal channels (Posthumus et al., 2019). However, the absence of refrigeration systems, poor control over cold chains and poor transportation causes significant losses of fruit and vegetables and strong price fluctuations in urban centres (PNiN, 2021). There are traditional, artisanal processing methods for certain kinds of produce (meat, onions, dairy), which supply important markets.

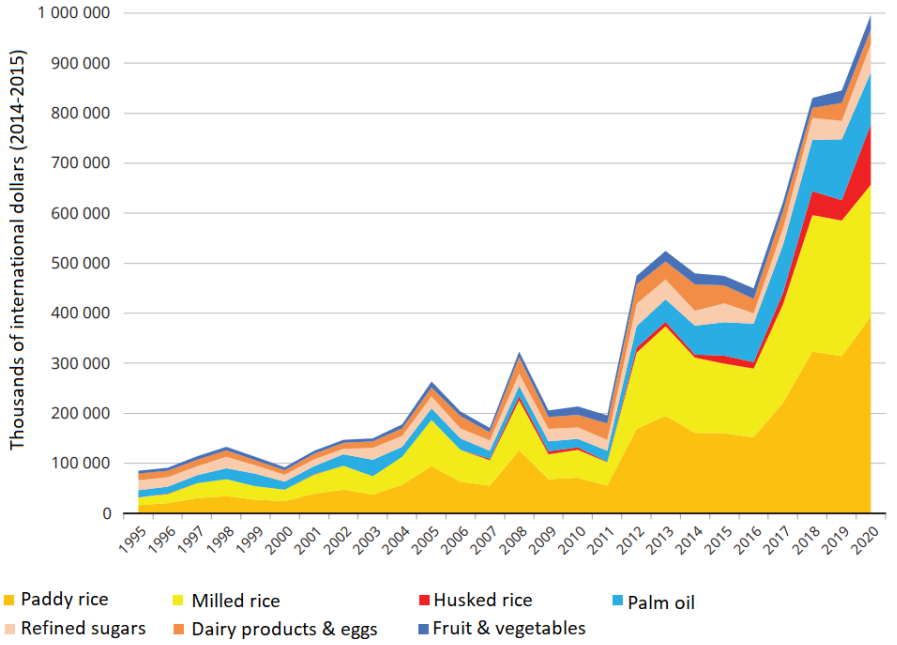

Figure 22 *Trends in main imported food items*
Source: FAO, Union Européenne & Cirad, 2023.

6.4 Retail

Overall, the modern retail network in the country is not well established. Most wholesalers and retailers are concentrated in urban centers. Food sales, including that of fresh produce, largely take place in traditional retail sites, including on-

Niamey is the most important national market and a centre of international trade, which also supplies urban households. Gaya market acts as the main urban market for maize and has cross border links. Maradi, Tounfafi and Diffa are regional assembly markets and cross-border markets for Niger and other countries. Many livestock-oriented households in cereal-deficient, northern

regions regularly go to these markets to buy their food. Nguigmi and Abalak are located in pastoral areas, where the population largely depends on grain markets for their food supply. These two markets are particularly important during the rainy season when herders are confined to the pastoral zone (FEWS NET, 2023).

6.5 Consumption

Millet, sorghum, maize, cowpea and imported rice are the most important food products consumed in Niger. Both poor rural and urban households consume millet and cowpea. Maize and imported rice are more important for urban households (FEWS NET, 2021). The consumption of meat in rural areas is low, as livestock is often repeatedly bought and sold, but rarely eaten. However, the consumption of chicken and meat is higher in urban areas – primarily in Niamey – and the growing middle class largely consumes more meat (US Department of Commerce, 2017). Despite this, meat consumption rates decreased by 1.2% between 2011 and 2017. However, Nigeriens still spend a significant proportion of their income on animal products, accounting for 11% of their total spending on average. On average, Nigeriens spent 54% of their household budgets on food between 2011 and 2017 (FAO, Union Européenne & Cirad, 2023).

Consumption patterns in Niger consistently exhibit insufficient intake of fruits and vegetables, legumes and whole grains. Access to protein through dairy consumption amounts to 30% of the recommended intake, similar to fish intake at 25%. Access to protein from red meat consumption is 60% of the recommended target. However, the high consumption rates of salt and sugar-sweetened beverages in Niger is concerning (Global Nutrition Report, 2023).

6.6 Food waste and disposal

Niger undergoes significant food losses due to the nature of its agriculture (scattered production in a vast, landlocked country), a lack of cold storage infrastructure and efficient transportation systems. Between 2010 and 2020, Niger experienced stagnant rates of cereal losses, from 13% to 12%, which is significantly higher than the regional average of 7% in 2020. Fruit losses appeared to be constant at 9% over the same period. Interestingly, pulses have undergone the highest percentage of losses, remaining at 25% between 2010 and 2020. This is significantly higher than the global and regional average, which are 4% and 6%, respectively (The Food System Dashboard, 2020). Despite this, these figures must be approached with caution because most agricultural produce is stored and traded in informal markets and chains for which few data exist.

6.7 Enabling environment

Although certain infrastructural elements have improved over the last few decades, the food production environment in Niger is challenging. Despite this, Niger invested 0.32% of its GDPA (Figure 23) into agricultural research in 2016. However, this is below the level required to sustain long-term agricultural productivity growth (ASTI, 2018).

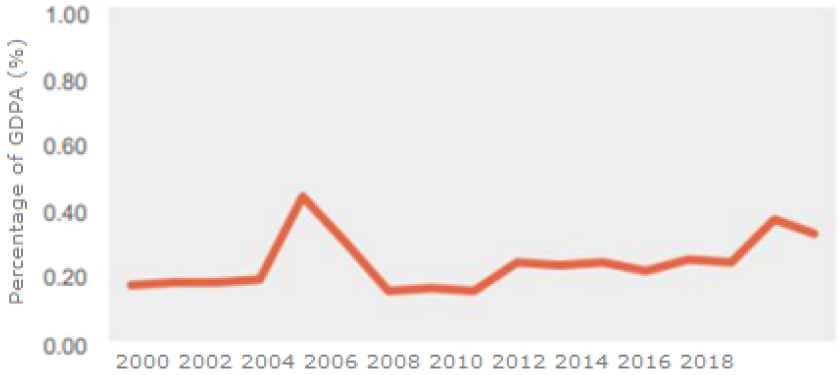

Figure 23 *Percentage of Niger's GDPA Devoted to Agricultural Research*
Source: ASTI, 2018.

6.7.1 Supporting services and infrastructure

In 2020, only 2% of Niger's population was able to access clean fuels and technology for cooking (World Bank, 2020d). Moreover, transportation is inefficient due to Niger's low population density (20 inhabitants per km^2) (Karkare & Van Seters, 2021). Despite Niger's young population, youth unemployment is a national concern, with poor access to education and vocational training. Moreover, the absence of processing services able to absorb the workforce further contributes to the high unemployment rates.

Despite access to electricity increasing from 4.4% of the population in 1992 to 19.3% in 2020, it is still very low, especially for the rural population: only 5.4% of the rural population is connected to the grid (World Bank, 2020c). However, mobile phone use has doubled and the population that has access to the internet quadrupled between 2000 and 2016 (World Bank, 2018). Niger has no regular rail services and domestic flights are limited. Subsequently, Nigeriens are dependent on the road network to connect communities and support economic activity. However, many rural roads are poorly maintained (UNOPS, n.d.).

6.7.2 The institutional environment

Education

Approximately half (49%) of the youth population (14–34 year olds) in Niger is uneducated. One in six people are educated in koranic schools, while 12.9% of youths attend primary school. Only 1.5% of the young population pursue higher education. There are disparities between rural and urban school enrolment: 42.4% versus 9.2% respectively. In 2011, youth participation in economic activity was only 54% (INS Niger, 2011). Since 2000, several plans have been adopted in an attempt to curb the high rates of youth unemployment. However, these plans are reported to have been underfunded and lacked robust, supporting institutional arrangements (FAO, Union Européenne & Cirad, 2023).

Agricultural institutions

Niger's investments in agriculture are relatively high. Between 2004 and 2011, Niger devoted 13% of its budget in agriculture. However, this percentage represents a decrease from 30% in the 1990s (APESS, 2014). Due to harsh environmental factors and complex social and political dynamics, Niger has become heavily dependent on international aid. Agricultural expenditure can be separated into investment expenditure and external resources (86%) (APESS, 2014).

International aid

The foreign aid and international assistance received by Niger is on the increase, amounting to 1,774.97 million USD in 2021 (The Global Economy, 2021). Despite numerous programmes that provide agricultural support, access to finance remains a key constraint in increasing agricultural productivity (Posthumus et al., 2019). The environment for doing business in Niger has improved. The time required to start a business has decreased from 35 days in 2000 to ten days as of 2016 (Posthumus et al., 2019). Niger scored a rating of 3 for CIPA transparency, accountability and corruption in the public sector (rating limits of 6 = high and 1=low) (World Bank, 2021f).

6.7.3 Food environment

National cereal stocks are maintained by the Office des Produits Vivriers au Niger for institutional assistance and in for preparation in case of emergencies. The Zinder, Niamey, Tahoua, and Maradi regions have the largest capacities for cereal storage, reaching 154,700 MT in 2014 (FEWS NET).

Marketing channels in Niger are not well developed, and they are minimally enforced. This has led to concerns about food safety and poor health as contaminated water sources are frequently used to prepare food. Poor sanitation practices and limited preservation technologies also risk increasing food borne-illness in Niger. In rural areas, food reserves are lost to pests, posing the additional risk of disease transmission (FEWS NET, 2014). Moreover, due to low incomes, many consumers are unable to afford better quality food at higher prices (Posthumus et al., 2019).

7 Food system dynamics and behaviour

7.1 Mapping the food system dynamics

To enhance the understanding of Niger's food system dynamics, it is necessary to draw links between its various elements: the drivers, activities and outcomes. The links and influences (+/-) between some key food system elements are mapped in Figure 24. This simplified causal loop diagram indicates a few general patterns in the system.

1. **Land governance** is a key driver of the food system. It leads to the different farming systems competing for the same resources and frequent outbursts of conflict, which aggravate the already fragile ecosystem. Additionally, poor land governance leads to increased land degradation and affects agricultural production in oases.

2. **Land degradation** is another key driver in Niger's food system, causing biodiversity loss, degrading soil, affecting the degree of food insecurity in rural populations and causing a decline in the land that is suitable for livestock grazing. Subsequently, the extent of land degradation can further fuel the increasing dependency on food imports.

3. **Political instability** has a significant influence on Niger's food system. It has led to increased outbursts of conflict, more internally displaced populations, poor access to finance and a poorly diversified economy, with a high dependence on agriculture.

4. **Limited access to finance** leads to increased poverty rates, causing low income consumers to spend most of their income on food items, reducing their ability to afford heathy diets, leading to cereal based diets.

5. **Over 63% of farmers are involved in livestock farming**, however, livestock is mostly traded and not eaten, influencing food security. Accordingly, livestock contributes to 12% of total exports.

7.2 System behaviour

Patterns in *system behaviour* (how elements of the food system interact) can be better understood by focusing on the *feedback loops* in the system: places where two elements affect each other. Several examples of how feedback loops manifest in Niger's food system are given below.

- **Low soil fertility and nutrient concentration:** Low soil fertility pushes farmers to concentrate nutrients in their fields. Although this enables localised increases in productivity, it depletes suitable arable land in the long run (Posthumus et al., 2019).

- **Growing population and limited land capacity:** The growing population results in the expansion of agricultural land into marginal areas and the fragmentation of land use. Total livestock numbers are also on the increase, and transhumance corridors have become fragmented. The increasing pressure on land exceeds carrying capacity, resulting in land degradation and deforestation (Posthumus et al., 2019).

- **Subsistence farming and growing population:** Population growth puts pressure on the food system, so local techniques seek to intensify production. However, agricultural productivity remains at the subsistence level. There is little surplus for international trade, processing or value addition (Posthumus et al., 2019).

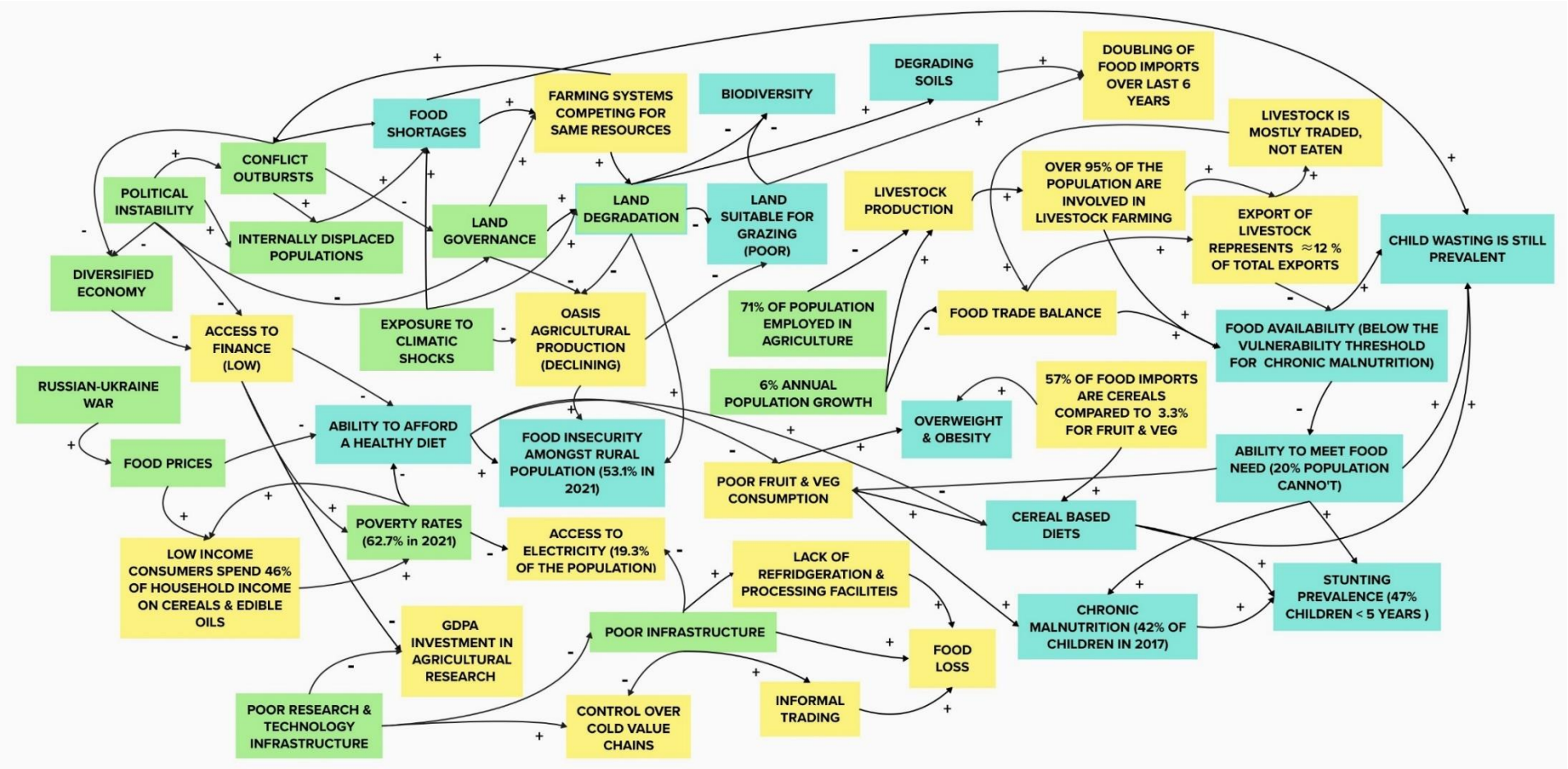

Figure 24 *A Draft Causal Loop Diagram of Niger's Food System*

Note: Food system drivers [green]; food system activities [yellow]; food system outcomes [blue].

This simplified causal loop diagram represents a preliminary analysis of the dynamics in Niger's food system.

Please note that this diagram is subject to change once the full range of impacts of the 2023 coup can be observed.

8 Conclusions

Niger's food system is characterised by several agricultural and pastoralist systems that co-exist in a challenging climatic and ecological environment. Food system drivers have contributed to steady progress in terms of achieving food system outcomes. However, recent events, including the coup in 2023, the COVID-19 pandemic, increased frequency and intensity of climatic shocks, and the effects of the Russian-Ukrainian war have slowed progress and, in some instances, reversed it. This has caused widespread implications on the national population as most depend on agriculture and pastoralism as a source of food and as a livelihood. This leads to the question: how can we ensure Niger's food system is able to sufficiently meet the nation's needs in the future while further developing resilience against future shocks?

This report is an attempt to create a solid foundation and an understanding of Niger's food system so these matters can be discussed with multiple stakeholders in the food system. This overview complements and draws on similar work produced by various initiatives. This report was intended to be validated and used as a foundation to co-envision plausible futures for Niger's food system and to discuss what can be done to support Niger's national food system transformation pathways, strengthen resilience and food system performance. However, following the coup in July 2023, these activities have been put on hold until further notice.

8.1 Food system outcomes

Food and nutrition security

Niger faces significant challenges in terms of food and nutrition security. In Niger, some livelihood zones are at high risk of food insecurity due to poor livelihood diversification and limited rainfall. Medium risk livelihood zones have irrigation and water sources that can promote off season cultivation and diversify production throughout the year. Low risk zones benefit from cross-border trading routes and reliable rainfall patterns that promote constant profitable cultivation and high value cash crops.

Despite the decreasing prevalence of undernourishment, recent events like frequent climatic shocks, political unrest, conflicts and COVID-19 have caused progress to be reversed. High rates of chid stunting are continuously observed, although wasting rates have decreased steadily. While Niger has observed a steady increase in available calories per person, this still remains well below the vulnerability threshold for chronic malnutrition. Niger's dependency on rain-fed agriculture and frequent droughts means food accessibility is limited, rendering a significant proportion of the population unable to afford a diversified diet.

Economic and social wellbeing

The agricultural sector contributes towards national GDP significantly, with most of the population being involved in farming or pastoralist activities. Agricultural employment has been high since the 1990s. However, high rates of youth unemployment persist. Despite the GDP reaching 7.2% in 2022, the 2023 coup affected GDP growth significantly. The ECOWAS trade sanctions and border closures will drastically reduce imports and exports. Without political stability, Niger's future is uncertain.

Environmental sustainability

Niger's food system greatly contributes towards land degradation. As the population continues to grow, so does cropland expansion. This has caused 57% of deforestation throughout the country and soil degradation. The agricultural system is additionally burdening the already scarce freshwater resources.

8.2 Food system drivers

Niger is undergoing a surge in population growth, with over 50% of its population aged 14 or below. Most Nigeriens live in rural areas, and poverty rates are high. GDP growth has averaged at 5.2% over the last two decades, however, due to political instability, violence outbreaks the impacts of COVID-19, progress has been reversed. The economy remains poorly diversified, with huge dependence on agriculture and livestock. Conflicts in neighbouring countries have led to high migration rates and many populations abandoning their land and livelihoods.

The main drivers of food consumption relate to a lack of knowledge of nutrition and good dietary practices, low food availability and high food prices. Research and infrastructure in Niger remains relatively poor, with high dependence on donor funding. The effects of climate change are becoming increasingly visible, with warming temperatures, longer dry spells and increasingly violent rainstorms, which put pressure on agricultural production. In the Sahara and Sahel regions, agriculture encroaches on livestock areas, even where agroclimatic conditions hardly allow for agriculture. The large agricultural areas of the Soudano-Sahel zones have become 'saturated' due to demographic and economic growth.

Due to significant demographic pressures, urbanisation and soil degradation, access to land is a fundamental issue for all livelihoods and local societies. The central state's main struggle with managing and protecting resources has been a constant factor over the past six decades. Recently, Niger faced both the COVID-19 pandemic and the fallout of the Russia - Ukraine war. COVID-19 restrictions contributed to food shortages. This occurred at the same time as severe floods, causing incomes to fall by 20–35% in Niamey, which led to a humanitarian crisis. The effects of the Russia- Ukraine war have been dampened due to Niger's low dependency on Russia and Ukraine, however, a decline in cereal production due to the flooding and COVID-19 meant that being unable to import cereal from Russia and Ukraine caused serious price inflation on the cost of living.

In response to recurrent crisis and food shortages, Niger's government has committed to improving food security and established the I3N Initiative to eradicate extreme poverty and hunger, and to ensure environmental sustainability. This means Niger has an active policy landscape across agriculture, livestock and fisheries. Niger has now incorporated seven national priority pathways into the I3N strategic framework. These seek to achieve sustainable and nutrition-sensitive food systems by 2030, in line with those of the UNFSS. Importantly, these drivers will be further shaped by events following the coup d'état in July 2023. Due to its recency, the widespread implications are still unknown.

8.3 Food system activities

Under growing land pressure, Niger's three farming systems compete for the same resources, often sparking local conflicts. Sorghum and millet are important staple crops grown among sedentary farmers and accounting for 94% of total cereal production in Niger. Over 75% of Niger's population are involved in livestock farming, which is an important source of income for the population. Food processing in Niger is mainly done on a small scale using traditional methods, with most food items being traded though informal markets. Niger grapples with a negative food trade balance, with imports exceeding exports. Livestock is a main export product, and dependency on rice and fruit imports is high. The country lacks a well-established retail network: food retail mostly takes place at traditional retail sites. Millet, maize, cowpea and imported rice are the most important food products consumed in Niger. Although pastoralism is widely practiced, livestock is rarely consumed. Due to a lack of proper cold storage and transportation infrastructure, food waste is a major issue, and food safety is of concern. Despite the presence of numerous programmes that provide agricultural support and extension services, access to finance remains a key constraint in increasing agricultural productivity.

8.4 Food system dynamics

Food systems are dynamic in nature and change overtime as a function of the interplay between drivers, trends and internal forces that steer the system in certain directions. Upon the drafting of a simplified causal l loop diagram of Niger's food system, several key drivers that shape the food system become clear. These are: land governance, land degradation, political instability and limited access to finance. These drivers make the dynamics within the food system more complex as more than 75% of Niger's population are reliant on farming (agriculture and livestock) as a source of livelihood.

In addition to these dynamics, several feedback loops can be identified whereby changes in one part of the system affects another, creating a continuous cycle of two interacting elements. One example is the interaction between farmers adding nutrients to the soil and soil fertility. This interaction leads to temporary localised increases in crop productivity. However, in the long term, soil fertility is compromised. This leads to the re-use of fertilisers and thus the cycle continues. Other examples include the feedback loops between population growth and limited land capacity, and the interaction between subsistence farming and population growth.

Making Niger's food system future-proof is a highly dynamic process whereby all policy makers and key stakeholders have to navigate its boundaries, explore internal relations between actors and activities, respect each other's interests, and enter the unknown together, to navigate the uncertainties that lie ahead. Only through collective action can we build a future-proof food system for Niger.

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