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# From diversity to uniformity: comparing nutritional transition of food consumption in four regions in Senegal

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## ABSTRACT

Rapid changes in the social and economic environment in the last few decades have resulted in a nutrition transition observed in many African countries, revealing large shifts in diet. Central to this evolution is the concept of homogenization of diet reflecting a notable trend toward increased uniformity in present-day food choices. As food changes are fundamental during the last generations, it is essential to collect oral narratives on foodways as long as older people can share their differentiated food knowledge from the past, and to study the impact of these changes in various African contexts, as well as the local reactions to these changes. This paper looks at the historical dynamics of what food consumption patterns was like in the past up to this present time in different regions of Senegal using different ethnographic methods. We argue that the diet of the present time has become more homogeneous thus affecting the pattern of food consumption options. Our findings showed that food consumption pattern over the last few decades has undergone changes due to the changing food production system. Moreover, the current households' diets in the Senegalese villages are converging toward an increased reliance on vegetable oil and refined staple grains.

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Nutrition transition; food pattern; homogeneous diets; dietary changes; transformation of foodsystems

## Introduction

Over the course of the past few decades, substantial transformations have occurred within global food systems and diet across the globe, which is driven by economic, social, and environmental changes (Béné et al. 2019; Reardon et al. 2019). This transition, often referred to as “nutrition transition,” is a phenomenon characterized by the changes in dietary patterns and nutrient intakes that occur when populations adopt modern lifestyles during economic and social development (Popkin 2001). Moreover, this phenomenon has been linked to the simultaneous rise in non-communicable diseases related to nutrition, which currently stand as the leading contributor to mortality globally (Naghavi

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et al. 2017). The common trends in characterizing how diets change during nutrition transition include higher intake of fats, especially from vegetable and edible oils, increased consumption of added sugars and reduced intake of cereals and dietary fiber including coarse grains, staple cereals and pulses (Hawkes, Harris, and Gillespie 2017; Popkin 2001; Popkin and Gordon-Larsen 2004). However, the way people are changing their dietary habits and the foods that are causing these shifts varies according to the region. African countries have experienced nutrition transitions over the past several decades (Harris et al. 2020) and the common narratives that have been linked to the causes of these changes include urbanization, population growth, climate change, as well as access to resources, institutional changes, intra-household gender-specific changes in activities (such as who is cooking, who has much time for food preparation). Furthermore, there are changes in taste with the availability of convenience foods and fast foods becoming preferred by parts of the population, whether due to convenience or taste or also linked to social status and notions of “tradition” and “modernity” (Abdou, Boëtsch, and Macia 2020; Liem and Georgina Russell 2019; Sproesser et al. 2019).

This paper examines the extent to which food consumption has evolved during the economic, social and institutional transformation that has occurred over the past few decades with a focus on fifty to seventy years back. It draws from the experience and local knowledge of the people living in Boundou, Senegal River, Bedik and Lower Casamance areas of Senegal. As outlined by Reardon *et al.*, Africa has undergone rapid changes in its social and economic environment during the past five to seven decades, with an acceleration in the past two decades, resulting in shifts in food consumption patterns (Reardon et al. 2021). Most importantly, there has been a marked worldwide shift from traditional food regimes to a diet that is high in fat, sugar, processed foods and low in fiber often referred to in scientific articles as the “Western diet” which is clearly associated with the increasing prevalence of chronic diseases such as obesity, type 2 diabetes, hypertension, and cardiovascular diseases, with stagnating high burdens of micronutrient deficiency (Baker and Friel 2014; Dubé et al. 2014; Gillespie and van den Bold 2017; Monteiro et al. 2013; Popkin and Shu Wen 2022). Traditional food is here used to mean a diet that is mainly plant based, rich in grains and fiber as defined in scientific articles (Chopra, Galbraith, and Darnton-Hill 2002; Popkin 2009; Popkin, Adair, and Shu Wen 2012). Moreover, traditional foods hold symbolic significance as representations of heritage, cultural identity, and distinctive local practices (Engler-Stringer 2010; Sharif et al. 2016). This article adopts the viewpoint of individuals within a given society or culture who characterize a “traditional diet” or food as a locally recognized and culturally significant dietary items that have been historically consumed within the community as these foods often hold cultural and traditional value, reflecting long-standing culinary practices that are deeply rooted in the local heritage. Our literature review on contemporary food systems and food production in Africa has shown that much of the consumed food now originates from outside the continent due to globalized markets. Furthermore, according to (Peres 2017), foodways and identities are in large measure, a product of a long history of colonial encounters through the introduction of new food (Peres 2017).

Senegal, home to roughly 13 million people with a per capita GDP of about \$1,900, is a Sahelian republic and former French colony. Nearly 40% of the population lives in poverty and rain-fed subsistence production has remained a main pillar of the local food

systems (World Food Programme, 2021). Millet, maize, sorghum and rice are the major food crops grown in Senegal, while crops, such as groundnuts, sugarcane and cotton are important cash crops. A wide variety of fruits and vegetables are grown for local consumption and export markets (Diagne et al. 2013). Given that the country's food production falls short of its internal needs, imports of rice and wheat have become necessary (Diagne et al. 2013).

In Senegal, traditional foodways are changing due to the pressure of modernization leading to abandonment of traditional foods in favor of more modern foods. However, local people react differently to this increasing dominance of “Western” foods and develop ambivalent positions to it, changing identities in relation to social and symbolic aspects of food and taste related to life and lifestyles as well as positionality related to class and gender (Dirks and Hunter 2013; Højlund 2015; Holtzman 2009). Especially Holtzman's work among the Samburu, in particular, helps to disentangle issues of dietary changes and how these are linked to internal conflicts of local societies, communities and even households. Holtzman contextualized the ambiguity of food preferences by considering the wider political economic and cultural changes within which food transformations must be understood (Holtzman 2009). In the complex economic and political interrelation of increasing globalization of foodways and narrowing local food systems, the local option of self-determination of food pattern is decreasing and external dependency and vulnerability is increasing. In addition, as argued in writings on the political ecology of food in anthropology, changes in food must be linked to changes in resource governance and property regimes associated with global colonial and post-colonial processes of land use change, loss of land and land related resources for local communities, an institutional change referred to as commons grabbing (Haller 2019). The expansion of industrial food production and conservation areas, especially in Africa, further limits the ability for alternative ways of food production (Haller 2019) and exacerbates the ongoing negative impacts from climate change (Gmür et al. 2022).

With these theoretical inputs in mind, we look at Senegal's dramatic food consumption changes that occurred during the last few decades. In Senegal, one primary challenge to be understood in terms of food transition is Westernization. Westernization is a process whereby societies come under or adopt Western culture in areas such as industry, technology, science, education, politics, economics, lifestyle, norms, diet, clothing, language and values (Pannilage 2016). As globalization and urbanization begin to exert their influence, we can see the adoption of noticeably different diets that no longer conform to traditional local habits (Pingali 2007). Furthermore, depending on the degree and pace of industrialization and globalization, different parts of the globe have experienced a mixed bag of positive and negative consequences and health outcomes (Popkin, Adair, and Shu Wen 2012; Swinburn et al. 2011).

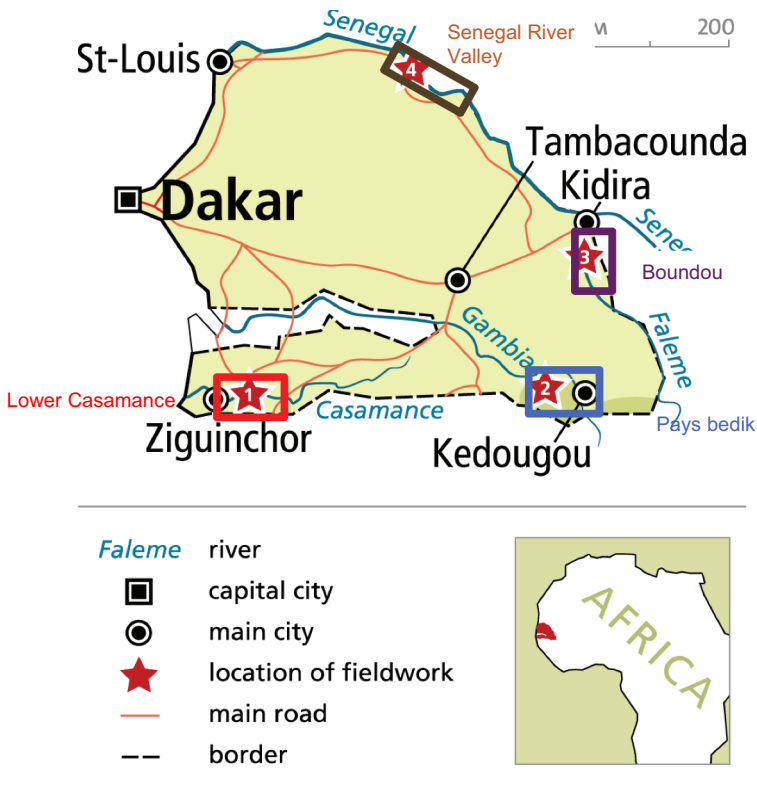
It is worth noting that an unhealthy diet and child malnutrition are among the current top risk factors for the global burden of disease (WHO and FAO, 2018). Therefore, as dietary intake is one of the major contributing factors to chronic diseases, a qualitative understanding of dietary patterns is imperative for designing strategies to reduce national and global diet-related disorders. It is thus of interest to see how current food consumption patterns relate to the precolonial and colonial periods and what the reason for these changes are from a local perspective. A better understanding of the dietary transition from the locally produced foods in the precolonial period, based on different livelihood

strategies, to the present day, can help inform health and agricultural policy (de Steenhuijsen Piters et al. 2021; Merten and Haller 2008). In addition, as an overarching goal, analyzing food consumption patterns from a historical perspective can provide novel insight to generate locally relevant health and nutrition-related knowledge that could improve the effectiveness of government interventions by providing policymakers with suggestions for designing safety nets compatible with local contexts and take into account the nature and extent of food insecurity.

## Methodology

### Study setting and context

Senegal is a country located in the western area of the African continent. It is bordered on the north by the Republic of Mauritania, on the east by Mali, on the south by Guinea and Guinea Bissau, and on the west by the Atlantic Ocean (Agence Nationale de la Statistique et de la Démographie and ICF International 2013). This research was conducted in four different regions of Senegal (Figure 1): Tambacounda (*Boundou*), Kedougou (*Bedik Country*), Saint Louis (*Senegal River Valley*) and Ziguinchor (*Casamance*). These four study areas were chosen because of the different food systems in their regions, for instance; the Casamance is known for rice-agriculture and fisheries (floodplain area),



**Figure 1.** Map of the study areas in Senegal (source: own work).

the Bedik country for rainfed agriculture and agro-pastoralism (semi-arid region), the Boundou for pastoralism (dryland area), and the Senegal River valley for rainfed and industrial agriculture, agro-pastoralism, and fishing (floodplain area).

**Boundou area:** Boundou is located in the eastern region of the modern-day republic of Senegal between the Upper Senegal River and Faleme River. The major ethnicity in this region is the Fulbes and Jakhankes. Koussan and Dide villages were selected for the study which are both rural areas. The Boundou area, which is known for pastoralism (dryland area), has been traditionally living off agriculture and livestock. These livelihoods have been subject to external influences such as climate shock and restrictions enforced as the area becoming a protected area in 2009. The people in these locations have generated concerns regarding the availability and quality of fodder or pastures due to restrictions of pastoral activities thus affecting their livestock production and hunting within the protected area. Alternatively, the protected areas have also served as a medium for wild fruit production such as the baobab fruits, which has greatly contributed to food security by allowing the population to access these nutritious foods when they may not have other sources of sustenance

**Bedik area:** Bedik is located in the southeast of Senegal, in the district of Bandafassi. The Bedik cultural landscape has been designated as a UNESCO World Heritage Site since 2012 and it is mainly inhabited by the Bedik and Peul. This case study includes three rural areas (Iwol, Ethiouwar:Bandafassi, Ousounkala:Manda Thiès), focusing on the local perspective of the dominant Bedik ethnic group. The Bedik area studied is a semi-arid region whose livelihood strategies include rainfed agriculture and agro-pastoralism. The local food systems of the bedik region has evolved from hunting and gathering to subsistence agriculture and subsequent cash crop cultivation. Despite this transition, game meat remains an important source of protein and hunting contributes to local food security and serves as a coping strategy, particularly during the dry season. However, access to game meat and collection of wild plants has become limited due to the introduction of various types of protected areas surrounding the villages. As alternative, ways of obtaining meat are not financially feasible for many people; therefore, certain individuals resort to illegal hunting, which puts them in a precarious position and forces them into the role of poachers. As a result, certain activities including hunting, fishing, and gathering natural resources are done in secret. This contributes to changes in community institutions, changes in distribution patterns, and a loss of social capital.

**Senegal River:** The Senegal River Valley is located in the north of Senegal bordering Mauritania. Most inhabitants of the area belong to the ethnic groups of Fulani, Soninké, Maures and Wolof. Research was done in the rural areas of Fanaye and Ndiael (Region of St. Louis), in the villages of Fanaye, Louguéré Goloumbo, Ndiayenne, Yetti Yone, Ngnith, Mboumba. The Senegal River valley is known for rainfed and industrial agriculture, agro-pastoralism, and fishing. The traditional agricultural system involved cropping, fishing and grazing of livestock with activities oriented toward the flood. Food consumption pattern in the Senegal River valley over the past decades has changed based on the changing food production system based on changed access to land and related common pool resources (CPR) in a context of agro-industrial transformations and climate change.

**Casamance:** The Lower Casamance region corresponds to the western part of Casamance. Its limits are, up north, the Gambia border and south, the Guinea-Bissau border. In the east, it is limited by the Atlantic coast, and the estuary of the Casamance

river, which gave its name to the region. In the west, the Soungrougrou river usually marks the end of Lower Casamance and the beginning of Middle Casamance. Lower Casamance gathers the region of Bignona (north of the river) and Ziguinchor (south), the latest being part of this study. It is mainly populated by Bainouks, Mandingue and Diola people. This study takes place in two rural villages in the department of Oussouye, both being Diola and Christian-animist villages. The Casamance, is known for rice-agriculture and fisheries (floodplain area). In Lower Casamance, in the region of Oussouye, the interplay between changes in climate, environment along with socio-economic transformations primarily driven by migrations, as led to a substantial transformation in both the local production of rice as a food source and the surrounding landscapes. While rice production remains central, the number, skills and motivations of the labor force as well as the quantity and quality of arable land have undergone major changes, reshaping the landscapes and social habits,

### ***Study design and data collection***

The data for this study was collected in the context of a larger research project on foodways in Senegal during a three-month exploratory phase between January 2021 and April 2021. Data was collected by a team of national and international (French, Nigerian, Swiss) researchers. Notably, each researcher conducted their investigations at distinct sites. Following the individual data collection phase, the team engaged in a collaborative process, sharing their individual experiences and findings to facilitate the amalgamation of the collected data. The purpose of the study was to gain a qualitative understanding of local knowledge and experience on the evolution of food consumption changes in the past and present. To this end, we undertook ethnographic fieldwork, information and data were collected through participant observation, field interviews, unstructured conversations, diary keeping, and focus group activities. In addition, data from oral narratives on food consumption was collected, using biographies in combination with oral history of stories and reminiscences of a person who first-hand knowledge of any number of experiences (Ritchie 2014; Thomson 2007). We therefore carried out interviews with older women and men over the ages of 70–110 years ( $n = 80$ ) who had experience with the colonial period in Senegal. Informed consent was obtained from each participant before the start of the interview. Each interview took between 30 and 60 minutes, and a trained research assistant/translator aided in all interviews and discussions, which were conducted primarily in French and local languages Pulaar, Jakhanke, Menike, Wolof and Jola. In addition, unstructured conversations and focus group activities were carried out with both young and older women within the household on “type of food eaten in the house,” “current food pattern” and “food preparation” since they are responsible for food preparation, as well as a large proportion of the agricultural labor, especially during the dry season.

Participant observation, particularly in terms of mealtime observation, played a significant role in this research. Participant observation was done by living with local families in the different villages of the different case study areas for several weeks (January 2021 to March 2021). The researchers spent days with various



community members, joining in their daily activities. Additionally, they contributed to household tasks, particularly food preparation, to observe ingredient usage, recipe variations, and discuss about the changes in food preparation. The research goals and interview questions were discussed with the research assistant/translator regarding appropriateness and sensitivity. Following the interviews or informal conversations, the researchers discussed the interactions and situations with the assistants to clear up any uncertainties. At the end of each day, each researcher wrote down in a daily diary what they observed, experienced during the day and also described the informal and formal interview situations, so as to make transparent any disturbing effects that could influence the answers of respondents as well as how the researcher themselves felt during the day and the conversations. This approach aimed to ensure transparency in both the participants' perspectives and the researchers' influences. Additionally, these diary entries were reviewed and discussed with research assistants during team meetings. The insights gathered from these descriptions were factored into the data analysis process.

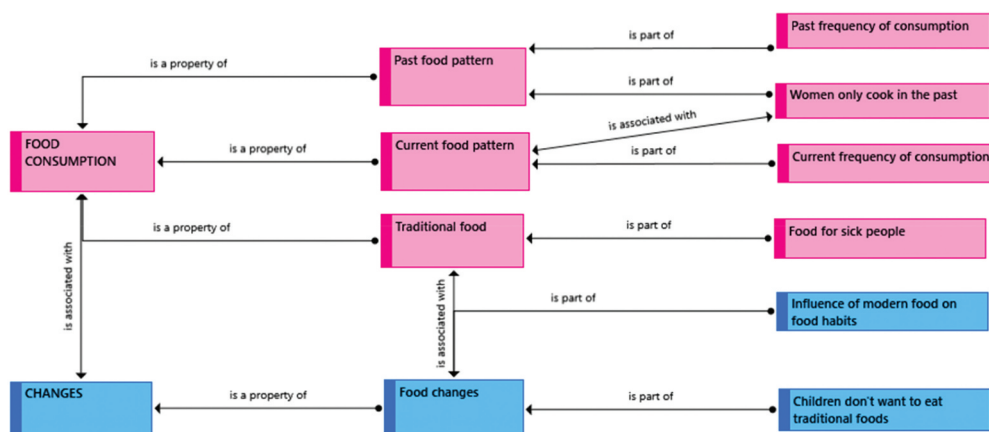
### **Data analysis**

The interviews were audiotaped, transcribed verbatim and coded using ATLAS.ti version 8. The transcripts and the diary notes were read several times to understand the information. All interview was coded using qualitative content analysis (Kyngäs 2020), a research method used to interpret textual data content through a systematic classification process involving coding to identify patterns or themes (Kyngäs 2020). The first two transcripts were coded by (O.B) and an initial list of codes was generated. The codes generated from this subset were discussed and revised with (S.M and T.H) before coding the remaining transcripts with (F.S, G. D, and O.C) Similar codes were identified and were then combined with those that were connected and at the same time forming the significant categories for the discussions. The transcripts were coded for current food patterns, past food patterns, frequency of consumption, traditional food consumed, food for sick people, and perceive changes in food consumption. The codes were arraigned into categories and themes that emerged from the data (Table 1). The relationship between the themes and categories included is shown in Figure 2.

**Table 1.** Themes and categories.

Theme	Category
Food consumption	Food patterns in the past
	Current food pattern
	Traditional foods
	Cooking roles
Local perception of food changes	Changing dietary patterns
	Drivers of changing dietary patterns

Source: own work



**Figure 2.** Schema showing the relationship between the themes and categories of codes that emerged (source: own work).

## Results

### *Historical pattern of food consumption*

Our qualitative data show that over the last few decades, food consumption in the four regions studied in Senegal has changed dramatically. These changes have been influenced by different factors including environmental and economic evolutions as well as demographic, social and cultural trends. Consumption of various food items depends to some extent on the agricultural and climatic conditions in each region. These regions are essential not only from a production perspective but also show distinct food cultures and dietary habits in terms of eating, preparation and conservation of different food items.

### *Past and Current food patterns*

In Senegal, rain-fed subsistence production has remained a main pillar of the local food systems. In all the regions studied, agriculture was basically everybody's service, and it was not a revenue-generating process because food was not produced for sale. About seven decades ago, the diet was based on traditional dishes made with different millet varieties in the Boundou, Bedik and Senegal River except for the Lower Casamance area, which was rice.

*"Those times there was no rice, only millet was our food, everybody was eating millets. Sometimes we eat different kinds of millets twice a day. Also, if we farm during the rainy season, we will save some of the harvest in our house such as millets and then I can use them in the next raining season"* (KV5, Male 85 years old, Boundou, Koussan)

*"When I was a child I was always eating 'to' (this is based on millet or poid de terre) but if I would serve that to the children of today's generation, they wouldn't know it and wouldn't even eat it"*. (MT9, Female 82 years old, Bedik, Manda Thiès)

*"People ate 'gniri et bouna' and 'gniri podé' made from millet and dried fish many years ago. All these foods were rich and nutritious for humans"* (FV13, Male 84 years old, Senegal River, Fanaye)

In contrast to the other region studied, Edioungou and Djivente villages, which belong to the Lower Casamance region, has a different food pattern. Food in the past in the Lower Casamance was based on rice and fish and sometimes meat.

“... Previously, the food eaten in the past was based mainly on rice that we harvested from the rice fields” (EV2, Female 82 years old Lower Casamance, Edioungou)

In collective societies such as Senegalese villages, food is collective within a household. Meals are served in a single flat dish on the ground, and people eat together with their right hand or while sitting on the floor or on little chairs. According to the oral narratives from each village and as shown in the below tables, people reported eating three times a day (breakfast, lunch, and dinner) in the past, and sometimes four times per day. Most of the time, the leftovers from the previous night are eaten first thing in the morning. Table 2 shows that in the Bondou region, millet porridge (known as *carao* in Fulbe; *mono* in Jakhanke) and maize porridge (known as *gossi* in Fulbe and *wuro* in Jakhanke) were the main dish eaten in the past for breakfast and this is considered a traditional dish among this two ethnic group. This dish is mixed with fermented milk or yogurt, it is considered very heavy and was perfect for keeping farmers full all morning in the fields. However, in this present time, people eat mainly bread and coffee or beignets (a sweet pastry fried in oil, similar to doughnuts) and coffee for breakfast. They generally drink instant coffee called “Nescafe” (the Swiss company name) locally called *café toubá*, or *quinquilliba* (a local tea) often mixed with lots of sugar. Millet or maize porridge (called *gossi* or *wuro* or *idep* or *lakh* in the different regions with the exception of Casamance) is eaten at breakfast in this present time only if there is no money in the family to buy bread. For lunch, the people ate *millet mafé in the past* known as *Nyirii* (Fulbe) or *Nyene* (Jahanke). *Nyiiri* or *nyene* is made of flour from grains such as millet or maize with cooked groundnut powder or sauce. The main dish for dinner every day was based on couscous (known as *latchiiri* in Fulbe and *foutonin* in Jakhanke). This couscous is made from either maize or millet and is eaten with soup known as *chakudi* or *haako* (Fulbe) and *khoulán* or *diambo* (Jakhanke). This soup is made from groundnut sauce or local vegetables. This dish is a favorite dish among several Senegal ethnic groups. In this present time, lunch is the most important meal of the day and it is usually rice-based. In the Boundou, *maro geje* (rice and pieces of dried fish) or *mafe* (rice and groundnut sauce)

**Table 2.** Past and present food patterns for Boundou area.

Meal pattern	Past food Pattern	Present food Pattern
Breakfast	<i>Gossi/Wuro (maize porridge)</i> <i>Carao/Mono (Millet porridge)</i>	<i>Bread and coffee</i> <i>Beignets (puffy fried doughnut) and coffee</i> <i>Gossi/Wuro (maize porridge)</i>
Lunch	<i>Nyiri/Nyene (millet or maize flour with groundnut sauce)</i> <i>Nyintindi (millet or maize flour with groundnut powder)</i> <i>Sato/Findo</i>	<i>Maro geje (rice and pieces of dried fish)</i> <i>Rice Mafe (rice and groundnut sauce)</i> <i>Maro liddi/Samene (rice with fish)</i> <i>Niankatan (rice and groundnut powder)</i>
Dinner	<i>Latchiiri chakudi/Foutonin khoulán (maize or millet couscous with groundnut sauce)</i> <i>Latchiiri haako/Foutonin diambo (maize or millet couscous with local vegetables sauce)</i>	<i>Latchiiri haako/Foutonin diambo (maize or millet couscous with local vegetables sauce)</i> <i>Latchiiri chakudi/Foutonin khoulán (maize or millet couscous with groundnut sauce)</i>

Note: Data collected by author (Source: Own work).

is mostly eaten and *maro geje* is generally considered the “dish of the poor.” Alternatively, rice is prepared with fresh fish (called *maro liddi* in Pulaar and *samene* in Jakhanke). These foods are accompanied with vegetables like carrots, potatoes, and cabbage. The groundnut sauce has its base flavored with onions, garlic, maggi and sometimes with shredded meat. On the other hand, if there is a lack of funds to purchase oil for cooking, groundnut powder is used as an alternative to oil and this dish is called Niankatan (rice and groundnut powder). Dinner is a smaller meal than lunch and it is based on maize or millet couscous every day. The Couscous is consumed with vegetables or groundnut sauce and this type of dish eaten remains the same as what was eaten in the past few decades. In terms of meat consumption, meat was consumed than fish in the Boundou area in the past because there was unrestricted access to hunting; however, consumption of meat has drastically reduced since the region became a protected area, as hunting became prohibited. In this region, hunting has always been part of the livelihood strategies in the past as bushmeat was the main coping strategy in the dry season. Most meat eaten at this present time is been bought from the market. Fresh fish was rarely consumed because there is no river for fishing instead, dried fish is eaten more when the family cannot afford to buy meat.

Food in the Bedik area was traditionally based on millet and fonio in the past, as seen in Table 3. Millet or maize porridge (*gossiri*) or *Idep* (*millet or maize dumplings*) with bissap or tamarind leaves was eaten for breakfast. At lunch and dinner, *Niatoua* (millet or maize flour boiled in hot water and served with vegetable sauce or okra sauce known as *gombo*) or *Ousache* (millet couscous with local vegetable sauce) or *Foyo* (fonio with *gombo*) or *Shabi* (fonio with groundnut sauce) is been eaten. In this present time, bread and coffee or local tea called *quinquilliba* are mostly eaten for breakfast in the Bedik area, especially among the families in Bandafassi. Sometimes people eat the remnant of food from the night before. In Iwol, people do not have direct access to bread, coffee or tea. Bread, tea or coffee is only consumed as a complementary food to the traditional dishes *gossiri* and *idep*. Rice based meals *Niankanta* (*rice and groundnut powder*), *thieb* (*rice with meat or fish*) or *Mafé* (rice with groundnut sauce) is the preferred food for lunch and dinner for the younger generation. If there is no meat available due to unsuccessful hunting or shortage of money in the family, groundnut pieces are used to give a different

**Table 3.** Past and present food patterns for Bedik area.

Meal pattern	Past food Pattern	Present food Pattern
Breakfast	<i>Gossiri</i> (millet or maize porridge) <i>Idep</i> (millet or maize dumplings) with dried fruits	<i>Bread and butter or chocolate paste with coffee or local tea</i> <i>Idep</i> (millet or maize dumplings) with dried fruits <i>Gossiri</i> (millet or maize porridge)
Lunch	<i>Niatwa</i> (millet or maize couscous with okra sauce) <i>Ousache</i> (millet couscous with local vegetable sauce) <i>Foyo</i> (fonio with okra sauce) <i>Shabi</i> (fonio and groundnut sauce)	<i>Thieb</i> (rice with meat or fish) <i>Niankatan</i> (rice and groundnut powder) <i>Mafe</i> (rice and groundnut sauce)
Dinner	<i>Niatwa</i> (millet or maize couscous with okra sauce) <i>Ousache</i> (millet couscous with local vegetable sauce) <i>Foyo</i> (fonio with okra sauce) <i>Shabi</i> (fonio and groundnut sauce)	<i>Thieb</i> (rice with meat or fish) <i>Niankatan</i> (rice and groundnut powder) <i>Mafe</i> (rice and groundnut sauce) <i>Niatwa</i> (millet or maize couscous with okra sauce)

Note: Data collected by author (Source: Own work).

**Table 4.** Past and present food patterns for Senegal River area.

Meal pattern	Past food Pattern	Present food Pattern
Breakfast	<i>Gossi maka</i> (maize porridge) <i>Gniri</i> (millet porridge)	Bread and coffee tea Rice <i>Gossi</i> (rice porridge) <i>Mbakhal</i> (rice, fish, <i>nététou</i> and vegetables)
Lunch	<i>Gniri bouna</i> (millet grain with dried fish) <i>Gniri pode</i> (millet grain and squash seed)	<i>Mbakhal</i> (rice, fish, <i>nététou</i> and vegetables) <i>Thieboudienne</i> (rice and fish) <i>Mafe</i> (rice and groundnut sauce) Pasta
Dinner	<i>Gniri bouna</i> (millet grain with dried fish) <i>Gniri pode</i> (millet grain and squash seed) <i>Gossi</i> (rice porridge)	<i>Thieboudienne</i> (rice and fish) <i>Mbakhal</i> (rice, fish, <i>nététou</i> and vegetables) <i>Lakh</i> (millet porridge)

Note: Data collected by author (Source: Own work).

flavor to the *thieb* dish. There is no specific dish that is exclusively meant to be eaten only for dinner in the Bedik area. From an emic perspective of meat consumption in the past, it was reported that the main source of animal protein in the Bedik area was the meat from wildlife species, which were hunted individually or in groups. Bushmeat consumption was much more in abundance, which could be attributed to the fact that there was free access to game meat hunting before it became a protected area. The Bedik region consumes less meat now than in the past due to wildlife immigration and conservation policies that have restricted hunting of game meat.

In the Senegal River, breakfast, lunch and dinner were also millet based in the past. As summarized in Table 4, millet or maize porridge (*gniri* or *gossi maka*) was the main meal for breakfast. *Gniri* also called *lakh* is a type of millet powder cooked with milk and dried grapes. For lunch and dinner, the people ate *gniri bouna* (millet with dried fish) or *gniri podé* (millet and squash seed). On the other hand, breakfast in this present time is mainly bread and coffee but families who cannot afford to buy bread eat rice-based porridge (known as *gossi*) or *Mbakhal*. *Mbakhal* is a traditional dish made from rice, fish, *nététou* and vegetables. At lunch, *thieboudienne* (rice and fish), *mafe* or *pasta* is usually eaten while *millet couscous*, *thieboudienne* or *mbakhal* is eaten at dinner. In this area, people do eat millet but mainly have to buy it, thus only people who can afford have more access to it.

“ . . . . . we can't afford it (millet). Millet is more expensive than rice and it's even hard to find. To have a bag of millet you need 2 bags of rice for example.” (FV21, Female, 42 years old, Senegal River, Fanaye)

Meat and Fish were eaten in the past but people eat more of meat daily in the Senegal River area. People had more cattle in the past because there were no sales of cattle, so it was easy to take from one's herd if they wanted to eat meat, but that has become more difficult or different in this present time as people buy meat if they want to eat it. Therefore, fish is mostly eaten daily in this present time, while meat is usually eaten on weekends depending on the economic status of the household and at ceremonies.

In the past, in the Lower Casamance region, white rice called *niankatan* in diola was eaten every day for breakfast (Table 5). This white rice is eaten plain in form of porridge known as *esumbi* and it is frequently mixed with a bit of milk, which is often obtained from exchanges with the nomadic pulaar people. At lunch, people eat *niankatan* with

**Table 5.** Past and present food patterns for Casamance.

Meal pattern	Past food Pattern	Present food Pattern
Breakfast	<i>Esumbi (rice porridge)</i>	<i>Bread and butter or chocolate paste with coffee or milk</i> <i>Esumbi (rice porridge)</i>
Lunch	<i>Bahamene or Bounioul (rice with palm fruit juice)</i> <i>Mutt (rice with palm oil)</i>	<i>Niankatan (white rice) with fish or vegetables</i> <i>Thieboudienne or thieb (rice with fish or meat)</i>
Dinner	<i>Bahamene or Bounioul (rice with palm fruit juice)</i> <i>Mutt (rice with palm oil)</i>	<i>Niankatan (white rice) with fish or vegetables</i> <i>Thieboudienne or thieb (rice with fish or meat)</i>

Note: Data collected by author (Source: Own work).

fish/pork juice or *niankatan* with lemon juice known as *bounioul* or *bahamene* (rice with the juice of palm fruits) or *mutt* (rice with palm oil). There is no specific food for dinner, if there were rice leftovers from breakfast or lunch, people will eat it at dinner. People in Casamance still eat *esumbi*, especially in most of the poorest families. More commonly, bread with coffee or dehydrated milk is eaten at this present time for breakfast. Niankanta with fish or vegetables (mainly carrots, onions and green eggplant) is mostly eaten for lunch and dinner. In certain families, mainly those with members migrating often or regularly to the north, they eat *thieboudienne* (rice with fish or chicken) “. . . .Nowadays, we eat bread with added chocolate, butter, and milk. Additionally, curdled milk has become a common ingredient we use, and everyone is entitled to a loaf of bread.”(EV7, Female, 82 years old Lower Casamance, Edioungou).

In the Lower Cassamance, people would eat a majority of fish, shrimps and oysters from the *bolong*, which is collected during dry season, whereas, during the rainy season when fishing is not possible, families consume dry fishes that they have preserved in salt. In this area, people would rather consume fish and oysters from the *bolong* while beef meat was reserved for village parties and ceremonies as it required a sacrifice/ritual preparation. In addition, people in this region consume a lot of chicken meat, which is the less expensive of all, and sometimes, when there are shortages, can be less expensive than fish.

### **Traditional food**

In any specific culture, traditional foods are seen as an expression of cultural identity and continuity of culinary traditions across generations. In addition, they reflect the dietary habits of the people since traditional food have been consumed for a long period of time. The basic cereals in traditional Senegalese foodways especially in Boundou, Bedik and the Senegal River is millets. In the Casamance, rice is the basic cereal and this can be attributed to the fact that the Casamance has a different ecosystem (more wetland) than the other region, which facilitates the rice culture. Among the Jakhanke ethnic group in the Boundou region, one distinct traditional food that is not been eaten in this present time is called *diamba massa*. This dish is made out of beans leaf, baobab seed, salt and water. Another traditional food called *ndayiro* is not commonly eaten in this present time. *Nydayiro* is made from baobab fruit mixed with honey and water. This food was a common dish in the past especially when there was a food shortage in the family. In the Bedik

region, traditional food such as *Niatwa* and *Ousache* remains popular especially among the older persons in Iwol. In the Casamance, *Niankantán* (the diola dish) is referred as the traditional dish and continues to be consumed this present time. In the Senegal River, *gniri bouna* is one of the basic traditional food of the past. *Gniri bouna* is a dish based on millet but in this present time, this dish is prepared based on rice because millet is more expensive than rice as reported by the people. Furthermore, concerning the traditional food provided to sick individuals, the older participants shared that *gossi/laru/fonde* (types of local porridge) and *bissap* (hibiscus flower, also known as the Roselle) are prepared and served to those who are unwell. These dishes are commonly consumed by both the older and younger individuals to help regain energy and appetite during illness. Additionally, *Niatwa* combined with dried baobab leaves, is given to sick individuals, particularly among the Bedik community

### **Cooking roles**

Cross-culturally women are more involved in food preparation than men are (Meah 2014). Historically, it is considered that women were the central figure in caring for and preparing food for their families; however, women's participation in the job market is changing how home food preparation is been handled. Food preparation in the study areas is gender-specific, a critical aspect of the Senegalese family structures. Our findings through our observational data reveals that cooking accounts for a large share of Senegalese women's domestic chores in all the regions studied and if a man is found cooking, he is considered diverging from social norms and acting against the local culture. However, it is the man responsibility to provide money, livestock, or permission for the women to work. Due to the prevailing social norms in the region dictating specific roles for men and women, women often face blame if any issues arise with the food preparation. Women were not only responsible for cooking the meal but also for farming, harvesting, processing grains, and preparing any leaves or vegetables that may accompany the meal. The status of women around the world influences food systems and diets through their increasingly important role in agriculture and food preparation (Pingault et al. 2017). Women have the predominant role in charge of the bulk of family food activities, which require a significant amount of time. Consequently, the amount of time spent on home food preparation is becoming more challenging thereby, creating a physical work burden. The women in the household prepare the food at home in the morning and then go to the fields to cultivate, returning to the house in the evening to prepare dinner, and this is the daily pattern until the end of the rainy season. Millet, which is one of the major staple food, requires long hours to prepare and is traditionally cooked by steaming in a perforated clay or metal bowl positioned over water or a sauce that is boiling in a big iron pot. After harvest, the millet is dried in the fields for a number of weeks before being cut with spades and put into spherical granaries with thatch roofs that are elevated above the grounds. The millet must first be dehulled and separated from the chaff in a large wooden mortar by the women, who must then grind it until it is fine enough to steam. The laborious and time-consuming process of crushing the millet with a hefty pestle, according to the village women, causes numerous pains, blisters, and aches. Nowadays, women are preparing more of maize, because it is more readily available and



easy to prepare compared to millet. In the Lower Casamance, the same procedure for preparing millets was reported for the self-produced rice and as a time-consuming procedure. The women complained a lot about the time they spend cooking at home. The young women often point to their mothers as examples they do not want to follow in terms of cooking activities.

### **Concerns about changing dietary patterns**

During the interview, the tone of the talk among the older individuals changes when the focus of the conversation changes from what had been done in the past to what is been done now, several of them expressed concern about the current generation of young women using accessible bouillon cubes referred to as *maggi* to cook. The worries raised by the older persons were that dishes in the past were not cooked with oil or *maggi* when compared with the food they eat today which is cooked with oil and *maggi*.

*“... Yes, the new spices that the women mix with rice, such as the jumbo and maggi, are things we don't like. However, the women hide to put them in the dishes.” (FV4, Male 78 years old Senegal River, Fanaye)*

*“Those cooking ingredients that didn't exist before to complement our food are now readily available; some are even prepared in factories.” (KV12, Male 85 years old Boundou, Koussan)*

*“... Having many options now has caused a lot of changes to our food system. In this present time, you can put many vegetables such as cabbage, carrot, salad, oil and Jumbo innto our meals” (KV2 Female 82 years old, Boundou, Dide)*

Although they reported, a positive change in the dishes of today in terms of having more options to complement their food. During one of the observation activities in Bedik, Iwol village, jumbo (*maggi*) actually belongs in every dish and is often criticized by men that women put it in every dish they prepare in these present times. However, if there is a dish that tastes strongly of jumbo, it is strongly praised by the men. Some older persons asserted that in their early experiences of consuming rice, groundnut powder or paste were used to cook it. However, they noted that in present times, if they want to cook rice and fish, then it is a must to have oil.

*“If you want to cook rice only, it is a must to have oil. Similarly, if you want to eat rice with fish as you wish, you will need to find some oil” (KV8, Female 87 years old, Boundou, Koussan)*

One of the young women in koussan village during our participatory activities in the kitchen said: *“I have to use oil if I want to cook rice. We have no choice because if you want to cook rice with fish, it is probably an evidence that you should find oil. Otherwise, you will have to cook something else” (KV22, Female 30 years old, Boundou, Koussan).*

During the unstructured conversation with the older adults in different households, they complained that young women who are responsible for cooking rely on jumbo or *maggi* and oil to cook, and they feel this is what is causing a lot of diseases presently when compared to the past.

*“... there is a very big difference between the food of today and that of my childhood, even the traditional food that we eat today are prepared in a different way, the dishes of today bring us*



*only diseases because of the use of jumbo, oil and some spices”. (MT7, Female 81 years old, Bedik, Manda Thiès)*

*“ . . . . . the types of food preparation that existed in past have changed today because today’s dishes are made with oi and jumbo or maggil, which did not exist in the past. Unfortunately, today’s foods bring a lot of diseases because of the use of certain things like oil, and certain spices like maggi which is very dangerous for our health” (KV14, Female 76 years old, Boundou, Dide)*

In contrast, during the participatory activities with women when they were cooking, the women reported that maggi is readily accessible and affordable. As a result, the younger women emphasized that the use of maggi and oil is important because it eases the way of cooking as well as helps their cooking taste better. The older people reported that the use of maggi nowadays signifies that women have become lazy and do not know how to cook and this means they are gradually neglecting the traditional way of cooking.

*“ . . . nowadays, women have become lazier, that is why they use maggi or oil, as they no longer invest the time and physical effort required for millet-related tasks as we did in the past . . . .” (FV6, Female 72 years old, Senegal River, Fanaye)*

In the lower Casamance, the availability of food also play a role. Bread with coffee is eaten in this present time at breakfast because many people cannot rely exclusively on the rice they cultivate, due to climate changes, soil degradation and diminishing labor forces. People do actually have to buy a lot of rice if they want to eat this for breakfast.

### **Perceived drivers of changing dietary patterns**

The older people spoke about the influences that affect the changes in food consumption in this present time. One of the key issues raised is the local discourse of food taste and modernity. Modernity in this local discourse refers to the increasing dominance of “Western” foods and the development of ambivalent positions to it (Dirks and Hunter 2013; Højlund 2015; Holtzman 2009). The modern foods, which are consumed more and more today, like pasta, bread and chocolate paste enriched with oil from the market bring about a notion of modernity. The older adults were particularly concerned about the decreased consumption of traditional food and the influence of their children on them in terms of consumption. For example, at breakfast, they reported that their children in this present time prefer to eat bread and coffee instead of the traditional breakfast diet called *gossi* or *wuro* and most times, they have to follow their lead.

*“Our children don’t know anything about the different wild leguminosas, not even the Niatwa that we used to consume. The children refuse to eat them now simply because they discovered other food products from the Western world, which has made them lose interest in the traditional foods” (MT3, Female 86 years old, Bedik, Manda Thiès)*

Also, during our observations with different households, the younger ones somehow dictate what is been eating, they only opt for *gossi* or *wuro* if there is no money to buy bread and coffee. Some women reported that they buy or prepare foods to cater to the tastes of their children. The Western diet has had implications on the traditional food and farming systems. There is an increased supply of processed foods high in sugar, salt, and oil to satisfy their food requirements. In addition, the purchase of imported rice, oil,

flavor enhancers like jumbo/maggi and other industrially produced products is significantly changing consumption patterns.

*“...so we have to sell some of our harvests to buy rice, coffee and some butter because the children of today don't like traditional foods we eat in the past.” (KV20, Male 83 years old, Boundou, Koussan)*

During our conversations with the older persons, the recollections of how they cooked traditional food and share these foods as children turned solemnly as they openly express concern about the influence of globalization and technology on food preparation, especially among the younger women. The older adults reported that people in this present time are eating dishes that are coming from the west and they tend to leave out the traditional dishes so they are worried that modernity is mixing with the traditional way of eating. While in the Lower Casamance, what is at stake is more a change in the habits due to Westernization and the new access to industrial products, mainly being white bread, industrial butter and chocolate paste.

*“Our children don't like the traditional foods again, because they see the modern life. Everything is tending to be modern, so mixing modernity and tradition becomes challenging in this context.” (KV16, Male 79 years old, Boundou, Koussan)*

## **Discussion**

The objective of this paper is to assess to what extent the food consumption patterns of the population have changed during the economic and social transformation that has taken place in the last fifty to seventy years and the reasons behind this shift. The influences on individual food consumption are complex and reach beyond individual preference. Institutional aspects such as the rights to resources needed for food production, and the culturally shaped age and gender-specific rights to food prepared in a household play an important role. In all the study areas, there has been a drastic institutional change related to access to resources, with the loss of common property playing a major role for local livelihoods and food production (Gmür et al. 2022; Owolodun and Merten 2023).

In three of the four areas, local land tenure rights have been under pressure since colonial times and specifically in the last 20 years. In these areas (Senegal River, Boundou and Bedik) protected areas have been extended, removing common property of land and land-related common pool resources, such as pasture, edible plants, fish, or wildlife. In addition, local lands have been under pressure due to mining and large-scale land acquisition as well as large-scale infrastructure changes such as dams. These changes did not only reduce access to local commons but contributed to environmental changes as well. It also changed the interrelations between nomadic and sedentary farming groups and their institutional arrangements of access to food producing areas as well as internal social relations in food production and consumption. Only in Casamance the commons grabbing process is not important while outmigration and gender specific changes related to the increase of workload for older women lead to the weakening of the traditionally very diverse rice production schemes. While consumption of various food items depends to some extent on the agricultural and climatic conditions in each region,

the actual changes are not just based on localities and climate change contexts only but have historical and national as well as global backgrounds (Gmür et al. 2022).

Food was enjoyed and shared within the family rather than produced for sale until the previous few decades, and most people had access to public lands, which were used for agriculture. Subsistence and semi-subsistence farming is still an important source of livelihood and food for many Senegalese with rainfall and seasonality playing an important role for subsistence food production. Over the past fifty years, diets have evolved over time and this has definitely been the case for the Senegalese populace. Food preferences, customary practices, as well as geographical, environmental, social, and economic considerations, have all affected dietary changes on an individual and national level. Traditionally in Senegalese villages in the past, the Senegalese diet used less processed ingredients and more natural ingredients than that of Western countries and its social practice is more geared toward a collective eating with family or friends.

In the Boundou region, millet and maize remain one of the main basis of food in the region as compared to the past; however, breakfast patterns have changed considerably to some extent as most of the people in this present time now eat white bread or *beignet* with coffee or *quinquilliba*. Lunch food patterns have changed the most. In contrast to the traditional millet food eaten in the past, rice-based meals are mostly eaten now. An oft-cited argument behind the decline in consumption of traditional staples, such as millet or sorghum especially for lunch was the lack of processed or pre-cooked derivative goods to minimize the normally lengthy preparation time (Zhou and Staats 2016). As a result, the reliance on rice became more pronounced as a convenient alternative (Diagne et al. 2013; Zhou and Staats 2016). Dinner, which is considered a small meal after lunch has hardly changed at all. However, some families eat leftovers from lunch or serve *gossi* for dinner if there is no couscous available because of shortage of millet or maize. Millet and maize once played a key role in the Senegal food system. Millet has been reported to be domesticated in several sites in West African Sahel regions (Manning and Fuller 2014). Gradually millet was occasionally supplemented with bread or rice. Since the 1980s, rice consumption has surpassed the consumption of other traditional crops, such as sorghum and millet in Senegal (Colen et al. 2013). To meet the country's quickly rising consumption demands, Senegal primarily depends on imported rice. This rapid increase in rice demand has been attributed to changes in consumer preferences and urbanization (Center 2011).

In the Bedik region, millet is remains an important crop for various festivities where traditional millet beer is been made. As millet is less cultivated in some Bedik villages, some families have to buy the millet so that they can participate in the festivities. Rice is cultivated on large fields, especially in Bandafassi, most of the rice harvest is sold and imported rice from Asia is then bought from the market for consumption. The additional labor input is slowly displacing the cultivation of traditional grains such as fonio and millet while the purchase of imported rice, oil, flavor enhancers like maggi and other industrially produced products is significantly changing consumption patterns. Traditional dishes (*niatwa*, *usache*, *foyo*, *sola*) based mainly on millet, maize and fonio are slowly being replaced by rice dishes such as *mafé*, and *thieb*. In one of Bedik villages-Iwol, that is still located on the hills, rice cultivation is not possible, which is reflected in the evolution of their food consumption patterns as people of all generations are used to eating *niatwa* but also using maggi cubes instead of natural flavoring.

In Lower Casamance, findings from our study shows that rice is still the main food consumed. Climate and environmental changes, as well as socio-economic changes (mainly migrations) have combined to transform the local rice food production and landscapes. However, while families used to produce rice before colonization in the village's rice fields, most of them rely nowadays on rice they purchase at their local store. Senegal currently imports rice to make up for the country's rice self-sufficiency shortfall despite the great potential to increase rice production (Faye et al. 2020). This rice is imported from Asia, and most of it comes from Pakistan. Such importations were decided at a national level in the 1980s–1990s to overcome the shortages of food and bad harvests, due to climate changes, droughts and the diminishing of the labor force, attracted by the perspectives of better-paid jobs in the urban centers. In the Lower Casamance, it is not so much climate change but internal changes of work collaboration institutions, which pose a problem on the long run for food resilience. In this context, the main food production of the group, once a shared task between men and women, older and younger, now seems to lie in the hands of a few people, mainly the older persons. This is due to the decreasing lack of workforce to maintain the rice fields and ponds, which is left to the older women because of institutional changes in the social and work/labor relations within the households. Purchased rice is cheaper in many aspects than self-produced rice. The latter is expensive because it requires a numerous workforce that needs to be paid with both money, food and drinks. People carry on producing rice, but keep it for ceremonial use, while relying on Asian rice for daily meals. Rice produced in Casamance is primarily grown for subsistence purposes and very little rice is distributed to other regions or major cities outside the Casamance (Osinski and Sylla 2018). Breakfast is the meal that seems to have undergone major changes in food patterns in Lower Cassamance. While people mentioned that fish and rice would also be eaten for breakfast in the past, most people in this present time now eat white bread and butter, curdled milk, chocolate paste and instant coffee. People seem to enjoy such Western foods, yet others, among the older population stick to the traditional *niankatan* for breakfast, especially men who prepare to go to the fields. White bread and butter is considerably more expensive than rice and for that reason, *esumbi* can still be observed in the poorest families at breakfast.

In the Senegal River, people do not really eat millet at this present time and most time if they do, they have to buy it, thus only people who can afford it have access to it because millet is more expensive than rice. In earlier times, the dishes were mainly based on millet, maize and sorghum as these foods were produced in the traditional way of rain-fed agriculture in the *jeery* (sandy) and *waalo* (floodplains) lands depending on the flooding of the river. However, millet is not produced much anymore in this area due to the introduction of irrigated rice production and the reason for this change can be attributed to the climatic conditions affecting the area. In Senegal, high-yielding Sahel rice varieties were first introduced in 1994 and widely adopted by farmers especially, in the irrigated regions of the Senegal River Valley (Faye et al. 2020). Thus, the food production system is based mainly on rice production today, leading to food consumption patterns with dishes based mainly on rice. The villages in the area of the reserves additionally have been affected by the establishment of the protected area as well as by an agro-industrial project. All changes resulted in reduced access to grazing land especially for Fulani herders, to forest products (firewood, Arabic gum

trees, fruit trees), to fish (change of ecology of the river due to dam, overfishing) and to farmland (Gmür et al. 2022).

In this present time in Senegal, globalized food chains, have contributed to the increased supply of processed foods high in sugar, salt, and oil that are cheaper to produce and transport. Abandoning traditional foods in favor of faster foods to expedite cooking is not unique to the regions studied or Senegal as a whole, but has been observed in other regions of the world (Abdou, Boëtsch, and Macia 2020; Mahadevan, Blair, and Rose Raines 2014). The categories of condiments and vegetable oil used in this present time based on our findings make up a greater part of food preparation. Since the 1970s, Diets began to move toward increased reliance upon processed foods and away from home intake and greater use of edible oils (Popkin, Adair, and Shu Wen 2012). Vegetable oil is increasingly been used both as a standalone product and as an ingredient in ultra-processed foods in all the regions studied and this is consistent with other studies, which found that vegetable oils have contributed more than any other food group to the growing world calorie supply – the “fattening” of the global diet (Hawkes 2006). Furthermore, given the high levels of “probable carcinogens” produced during the palm oil refining process, there is concern over the increasing use of palm oil as a cooking oil in many developing nations as well as an ingredient in the manufacture of ultra-processed foods (Wallace et al. 2016). The adoption of oil for food preparation appears to be a general trend in Senegal, and while its use suggests a shift toward energy-dense foods and is likely to contribute to the increasing burden of NCDs, particularly diabetes and cardiovascular diseases (CVDs).

Taste preference and the desire for “modernity” seem to play a role as well in our study as we observed a generational divide regarding culinary practices, with the younger generations depreciating traditional food and cooking methods. The young women especially sought to conform to the “Western/modern” model and at the same time to reduce the amount of work (physical labour/time) involved in cooking. This narrative corroborates with similar study in Senegal which found that housewives of all social classes also conforms to the notion of modernity when it comes to food preference and preparation (Abdou, Boëtsch, and Macia 2020). Factors influencing the opportunity cost of time in home processing and food preparation can fuel the rise in processed food consumption. According to a study by (Reardon et al. 2021), factors that have contributed to opportunity cost influencing home food preparation include increasing numbers of women working outside the home in both urban and rural areas, and men increasingly commuting to urban jobs and off-farm jobs in rural areas. This led at first to the shift from home processing, for example, hand-pounding grain, to purchasing low processed products like milled grain and oil, and highly processed products, like traditional fritters, and then packaged foods, like cookies and bread (Reardon et al. 2021). In addition, the taste of food or food preferences of the family were key factors in the household food purchasing decisions. Many women stated that they intentionally prepare foods that they know their children and family members enjoy eating and that would make them happy.

The emerging changes in the Senegalese food system need to be given attention to. Diet quality needs to be tackled at both ends of the spectrum by increasing access to nutrient-rich foods and reducing the consumption of nutrient-poor and ultra-processed foods. One key suggested action that could address this nutrition transition will be to promote diversity in the production of nutrient-rich foods including fruits, vegetables

and pulses, as well to support supply chains that make these foods accessible and affordable. Urbanization, taste, and preferences have been identified as crucial drivers of food demand, contributing to the shifting consumption pattern, which has a substantial influence on the future food system. In addition, this will increasingly dictate what foods rural producers grow and how these foods are traded, processed, and marketed, changing the markets for rural producers (Satterthwaite, McGranahan, and Tacoli 2010). Therefore, a better understanding of its impact on dietary patterns will contribute to improved projections on future food demand and the findings from our study may be crucial to inform policymakers and researchers about how consumer food demand is evolving and thus help policymakers design an effective health and food security and nutrition policy as well as agricultural and trade strategies.

Last but not least we also see underlying institutional changes at work: the expansion of state and private property ownership, as well as the creation of conservation areas, have led to restrictions or limitations on the ability to produce or gather certain types of foods and these changes are shaping the availability and access. It becomes therefore more difficult to gather wild products and hunt game and to graze animals for access to milk and beef as well as access to fisheries, all common pool resources previously in common property and institutionally regulated (Gmür et al. 2022; Owolodun and Merten 2023). In addition, internal institutional intersectional changes of gender, generation and class as well as interethnic relations between farmers and pastoralists (transhumance mobility) have changed access to resources within (seasonality) and between years (Gmür et al. 2022). Exacerbated are these changes by longer periods of droughts and other climate change-related transformations (Gmür et al. 2022).

### ***Strength and limitations***

One of the strengths of this research lies in the meaningful utilization of participant observation, specifically in the context of mealtime observation, which substantially enriched the study's methodology. Participant observation is a central method of data collection in social anthropology and it is one of the core instruments during the whole research period as it produces experiential, qualitative, and context-specific knowledge that allows researchers to gain a deeper understanding of the studied social phenomena. In addition, as a research method, oral history used in the study is known to offer insights into food cultures over a significant historical duration and reveal alternative ontologies of food to the secular assumptions characteristic of development theorists and practitioners (Wilson 2019). Memory and the process of remembering are at the heart of oral history, and this study draws primarily on older people's life histories or autobiographical memories. Furthermore, oral histories are not reliable as the sole resource to comprehensively understand particular historical and societal changes, due to their subjective nature and the "multiple truths" that exist (Thomson 2007). For example, if we had a complete picture of the past eating habits of people using the 24 hr diet recall fifty years ago and the current eating habits using 24 hr diet recall, it would have been a good source of cross-referencing. Moreover, even if we decide to do a survey in this present time on diet recall, we would only be able to get information about today's food consumption. Therefore, one of the ways to explore these changes in regards to food consumption



evolution is to get the perception of these older people who had experiences with the colonial period through oral history.

## Conclusion

Food consumption pattern in the regions studied over the past decades has undergone changes due to the changing food production system. These changes are a result of shifts in access to land and related common pool resources, occurring within the context of agro-industrial transformations and climate change. Our study shows that food has become more homogeneous in the Boundou, Bedik and Senegal River while in the Lower Casamance, it is difficult to say that food patterns consumption is more homogeneous than before but what can be seen is that there is less of the older foods and also less variety of foods than before, especially protein foods. This homogenization of diet highlights a crucial aspect of the ongoing nutrition transition, shedding light on the evolving nature of food choices in these communities. Furthermore, many households may have limited or no economic access to animal-source meals or other nutrient-rich food-like fruits, fish and vegetables, which might contribute to more nutritionally significant diet diversity which was the case during the time of the past two generations. In addition, our study also shows that the current households' diets in the Senegalese villages studied are converging toward an increased reliance on vegetable oil and refined staple grains such as white bread, pasta and this shows that people increasingly have access to new foods that they had rarely consumed previously in the past decades. However, this does not mean that household diets have an increased diversity of foods because foods eaten and accessible in the past fifty to seventy years have been more diverse as they were not commodified and were also accessible in areas that are not accessible anymore. Moreover, while the adoption of oil for food preparation appears to be a general trend in Senegal, its use signals a move toward energy-dense foods and this is likely to contribute to the increasing burden of non-communicable diseases, particularly diabetes and cardiovascular diseases.

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## Ethical approval and consent to participate

This project was registered (DPC/NS 01–008) and received approval from the ministry of culture and communication and the cultural heritage directory of the Republic of Senegal. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Verbal informed consent was obtained from each respondent prior to the interviews and discussions.

## Availability statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

## Author contributions:

Conceptualization: [OB]; Methodology: [OB, GD, FS, OC]; Formal analysis and investigation: [OB, GD, FS, OC]; Writing – original draft preparation: [OB]; Supervision: [MS, HS]. All authors commented on previous versions of the manuscripts, read and approved the final manuscript and contributed to the intellectual content.

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