

**CONTRIBUTION OF LAND TENURE SYSTEMS TO FOOD SECURITY AMONG  
THE BAYAKA OF BELEMBOKE I AND BELEMBOKE IV IN NOLA, CENTRAL  
AFRICAN REPUBLIC**

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Arts Degree in Social Transformation with Specialisation in Sustainable Development

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## DECLARATION

I, the under signed, hereby declare that this thesis is my original work and has not been submitted to any other college or university for academic credit.

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Signature.....

Date.....

We confirm that this thesis was carried out by the candidate under our supervision.

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## **DEDICATION**

I dedicate this work to:

My parents Isidore Djossou Yaovi and Marie-Thérèse Biaou.

And to Thomas Isidore Noël Sankara.

## **ACKNOWLEDGMENTS**

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## **ABBREVIATIONS AND ACRONYMS**

ACHPR	African Commission on Human and Peoples' Rights
CAR	Central African Republic
CFS	World Food Security
DRC	Democratic Republic of Congo
FS	Food security
FAO	Food and Agriculture Organisation of the United Nations
FFCS	Forest Food Consumption Score
FSC	Food Security Corridors
FSN	Food security and nutrition
GSF	Global Strategic Framework for Food Security and Nutrition
GSSF	Guidelines for Securing Sustainable Small-Scale Fisheries
HDDS	Household Dietary Diversity Score
HDP	Human Population Density
HFCS	Household Food Consumption Score
HFIAS	Household Food Insecurity Access Scale
IHS3	Household Survey for Malawi
ILC	International Land Coalition
ILO	International Labour Organisation
LSMS	Living Standard Measurement Surveys
LTSs	Land Tenure Systems
LTS	Land Tenure Security
OHOG	One Home One Garden
SAP	Sustainable Agricultural Practices
SDGs	Sustainable Development Goals
SMA	Society of African Missions
STF	Social Transformational Framework
UNCCD	United Nations Convention to Combat Desertification
UNDPI	United Nation Department of Public Information
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples

## ABSTRACT

Land and food security are crucial issues that impact people everywhere, but they are especially vital for indigenous communities around the world. The purpose of this study was to determine the contribution of land tenure systems to food security among the Bayaka of Belemboke I and Belemboke IV, in the Central African Republic. The study specific's objectives were to assess land tenure systems' contribution on food security, to appraise the impact of land tenure security on food security and, to identify a social transformational framework for land tenure systems and food security among the Bayaka of Belemboke I and Belemboke IV in Nola, Central African Republic. The study was anchored on Functional differentiation theory, "*Zo kwe Zo*" perspective, and Lockean *proviso* theory. Using an ethnological approach, 59 youth and adult participants were selected through snowball and purposive sampling. Data collection methods used were interview guides, focus group discussions guide and observations guide. Triangulation ensured trustworthiness, and thematic analysis was used. In alignment with (SDG 15) Life on Land, (SDG 2) Zero Hunger, (SDG 16) Peace, Justice and Strong Institutions and ILO Convention 169, the research revealed a strong connection between land tenure security and food security for the Bayaka, highlighting the importance of land rights for their sustenance and well-being. Private land ownership enhances FS despite communal resource changes. Disparities between villages, especially Belemboke I's stable LTS, foster community development despite encroachment and disputes. The findings highlight the interdependence of LTSs and FS, underscoring the need for collaborative approaches to address the complex challenges faced by indigenous communities. The outcome of the study could enhance land and food security for the Bayaka by improving sustainable cultural practices into innovative environmental conservation efforts.

## OPERATIONAL DEFINITION OF TERMS

**Bayaka:** Pygmies in the southwest of the Central African Republic are referred to as Bayaka; in other studies, they are known by the "Aka" clans. In addition to these names, pygmies are also known as "Ba'Aka", "Babenzele" (which denotes that they are Mbenzele language speakers) or "Babinga" in Central African Republic and "Baka" in Cameroon.

**Bantu:** This generally refers to a non-pygmy group that are also known as **Bilo**.

**Belemboke I:** established in 1973 with the help of Belgian missionary Fr. Michel Lambert and support from Emperor Bokassa, it is a Bayaka village seeking independence from the Bilo. The Catholic Mission has since maintained priests and nuns to promote the village's comprehensive development. It is divided into 8 **quarters** which indicates the delimitation of distinct neighborhoods within a village.

**Belemboke IV:** is a Bayaka village also established in 1973 by members of various Bayaka groups who aimed to be emancipated from the Bilo. It is located 3 km in the North of Belemboke I. when compared to its southern neighbour, it is apparently weaker in terms of LTS and FS.

**Contrasting model:** it emphasizes the differences between the communities of Belemboke I and Belemboke IV regarding their success in utilizing land and achieving food security despite facing challenges. Belemboke I is highlighted as a particularly successful community in these aspects and is suggested as a potential future socio-cultural benchmark for other Bayaka settlements that are struggling to achieve similar success.

**Coping strategies:** They are temporary solutions used when a household or community lacks the money or food to meet all of its basic demands.

**Customary land tenure:** In the Central African Republic, customary law manages property rights according to tradition, acknowledged by Law No. 63 but limited to land use-rights. This study uses "customary" instead of "indigenous" to reflect social transformation.

**Enough Food:** in this study, a sufficient diet for an individual male or female should include a balance of macronutrients within the USDA's recommended ranges: 45-65% carbohydrates, 10-35% protein, and 20-35% fat, with an emphasis on nutrient-dense foods from all food groups to meet vitamin and mineral needs (Espinosa-Salas, S., and Gonzalez-Arias, M. 2023).

**Food security (FS):** in this study, food security is intrinsically related to its availability, approachability, utilisation, and steadiness. It serves as a gauge of social transformation that can be used by government and citizens.

**Land Tenure Systems (LTSS):** in this study, is a social concept that defines the interactions between individuals and groups of individuals by which rights and obligations (with regard to control and use of resources) are observed. Furthermore, in this study, LTSS and LTS are strongly intertwined variables.

**Land Tenure Security (LTS):** is the assurance that one's land rights will be respected and upheld by others, especially when faced with particular difficulties. The Transformational Framework, which strives to protect the Bayaka's right to their ancestral land, and land tenure security are intimately related in the context of this research.

**Nola:** is situated at the confluence of the Kadéï and the Mambere rivers, serves as the capital of Sangha-Mbaéré, an economic prefecture within the Central African Republic. The study's location falls under the administrative jurisdiction of Nola.

**Private land tenure:** The Central African Republic's statute No. 63 of 1964 allows for the land registration-based privatisation of public lands.

**Public land tenure:** According to Law No. 63 of 1964, state land in CAR can either be considered private property or part of the state's public domain. Natural resources like rivers and man-made assets like highways are both included in the state's public domain.

**Social Transformational Framework:** in this study, a comprehensive compilation of all potential innovations that contributes to ensuring land security for the Bayaka community leads to their capability in achieving Food Security through equitable distribution, affordability, and enhanced purchasing power.

## CHAPTER 1: INTRODUCTION

### 1.1. Introduction

The endorsement of the International Labor Organisation (ILO) Convention-169 in 2010 provided substantial support for the shared goals of the Bayaka people and the Central African government. This convention highlights the importance of protecting the rights of indigenous communities to their traditional lands, irrespective of formal documentation.

Property rights are founded on a social agreement as their fundamental principle. Land tenure, in essence, is the rule that defines how the members of a given culture will utilise and manage their resources. Social agreements can occasionally be reached through dialogue, compromise, and common values. (Sani Jauro & Ibrahim, 2016). What we now refer to as customary forms of tenure are the results of long-term interactions between traditional forms of tenure from before colonialism and new ones that were developed during that time. Customary land tenure systems LTSs are geographically and politically diverse as they serve as capital factors on which food production is based in most places. (Holland et al., 2022).

Food security, according to the Food and Agricultural Organisation (FAO), means that every individual has ongoing access to enough safe and nutritious food that meets their dietary needs and preferences, enabling a healthy and active life. This comprehensive definition, encompasses physical, social, and economic dimensions (FAO, 2002). Additionally, the concept was expanded at the World Summit on Food Security, incorporating stability as a crucial factor to evaluate the resilience of food systems against various shocks (FAO, 2009; Peng & Berry, 2019). The indigenous people residing in the heart of Africa serve as a prime example, illustrating the intricate connection between land and FS and emphasising the importance of this association. Markowska-Manista (2017) cites American musicologist Sarno as saying that the fate of the Bayaka people and their forest are inextricably linked. For the Bayaka community to have a safe future, the forest must be preserved in a healthy state.

In the Central African Republic, the Bayaka are the first of the two major indigenous groups to be recognised as such. The name Bayaka or Ba'Aka is used when referring to the Aka, who refer to themselves as Baaka (Aka people). The Aka are a member of the larger hunter-gatherer groups that have been residing in the tropical forests of Central Africa for a very long time. Despite the negative connotation associated with the word, they are frequently referred to as "Pygmies." They are most often found in the western part of the nation, namely in its forest regions (Gilbert, 2020).

When the village of Belemboke I was created in 1973 by the Bayaka with the help of the Catholic Church, it was recognised as a private domain according to the records of the State and the Catholic Church (Guadalupi, 2018). The village was founded on an emancipatory agenda, which entails the following 6 basic needs: i) their recognition as human and citizens, ii) the provision of an adequate food supply, iii) access to clothing, iv) the availability of shelter, v) the opportunity for education, and vi) access to healthcare services. A review of some documents from the local government and the Catholic Church have confirmed that Belemboke I stands out among many other Bayaka villages (Guadalupi, 2018).

This first chapter, provides an overview of the study focusing on the land tenure system (LTS) as a tool for social change within the Bayaka communities of Belemboke I and Belemboke IV in Nola. The chapter starts with a brief introduction to the research topic and then gives the the insertion of the researcher into the study topic. This is followed by: study background, problem statement, purpose of the study, research objectives, research questions, significance of the study, study assumptions, scope and delimitations of the study, and ends with a summary.

## **1.2. Insertion**

The researcher is a priest serving the Catholic Church in a variety of roles, including as a counselor in the Society of African Missions (SMA) leadership team, a member of the College of Consultors in the Diocese of Berberati, in the Central Africa Republic (CAR), and a parish priest in the mission of Belemboke. Thus, interactions with various layers of people inspired him to be involved in important social transformative issues regarding how to increase FS among the most abandoned.

Originally from Benin Republic, the researcher, however, grew up in Ikeja, a neighbourhood at the heart of Lagos, Nigeria, where he witnessed the legacy of Chief Justice Idowu Taylor, whose property he was living on. A happy childhood in the middle-class environment that he shared with most of his friends who were children of law enforcement agents, helped to shape the researcher's concept of advocacy for the less privileged. With a background where equality and justice for everyone mattered; his experiences with the Bayaka revealed the difficulty of the indigenous communities within the Prefecture of Sangha-Mbaere. In the mission of Belemboke, he learned more about the struggles the Bayaka faced and how the government, the Catholic Church, as well as many others, have worked to improve their living conditions.

The researcher was perplexed by the significant disparity in development observed between the village of Belemboke I and other Bayaka communities in Nola, Sangha-Mbaere. After a decade of observing and gathering accounts from various indigenous Bayaka communities, the researcher also learned that the Bayaka people continue to face numerous difficulties and challenges, despite the government's efforts to address discriminatory practices. With the exception of Belemboke, whenever they established themselves in a location to preserve their way of life, the other ethnic groups quickly drove them out. The Bayaka consequently have endured abject poverty, illiteracy, and dependence on the very people who exploit them. It is this painful pastoral experience that motivated the researcher to carry out this research.

### **1.3. Background to the study**

Ethnic minorities around the world have faced significant land rights violations, critically affecting food security. These violations disrupt essential resource access, undermining communities' ability to sustain livelihoods and cultural practices. Examples from various regions show how land tenure issues directly impact food security and the well-being of affected populations.

The systemic violations of land rights faced by indigenous peoples in Canada, particularly through policies like the Indian Act, have significant implications for food security. Ninomiya (2023) highlights the mental health effects of land dispossession on Indigenous communities, emphasising the importance of policies that recognise and safeguard Indigenous land rights to improve mental health outcomes and overall well-being for these populations. Similarly, in the United States, Knight et al. (2022) examined the vital link between land rights and food security, asserting that secure land tenure allows indigenous communities to access resources, invest in sustainable agriculture, and uphold food sovereignty. These authors argue that violations of these rights threaten food security and biodiversity.

In the southern hemisphere, the Guarani people in Brazil faced significant threats to their land rights due to agribusiness expansion and illegal land grabbing, leading to violent conflicts and displacement (Aleixo, 2022). To address food insecurity among the Guarani, a culturally relevant food security scale was developed and validated, reflecting their unique dietary patterns and food access challenges. This tool provides precise data for tackling food insecurity in indigenous contexts (Segall-Corrêa et al., 2018). Also, in South India, the findings of a study carried out by

Dagdeviren et al. (2023) revealed that secure land tenure significantly boosts food security by encouraging agricultural investment and productivity. It further underscored the role of government policies in supporting land rights and addressing socio-economic inequalities and stressed that enhancing land tenure security can improve food security outcomes, especially for marginalised communities.

Furthermore, in Finland, Svensson (2023) highlighted the Sami people's ongoing struggle for recognition of their land rights, particularly regarding reindeer herding territories, is intricately linked to issues of food security. Although there are some legal protections, the Sami's traditional lands face constant threats from mining and forestry industries, leading to cultural erosion and economic difficulties due to their deep connection to these lands. Similarly, in Australia, Aboriginal peoples have endured extensive land rights violations, particularly through dispossession during colonisation (Properjohn, 2023; Ivison, 2022). In addition, other studies conducted in Australia among the Aborigines, revealed that recognising indigenous land rights correlates with improved food production and community resilience (Pollack, 2018; UNDPI, 2018). This connection highlights the importance of land tenure systems in facilitating food security, particularly for indigenous groups. Africa also has its share of the violation of the rights of the minorities.

In Tanzania, the Maasai community has experienced land rights violations due to government policies favouring tourism and conservation over Indigenous land claims. This has led to forced evictions and the loss of grazing lands, severely affecting their nutritional regime and cultural practices. The Maasai's struggle for land rights remains a crucial issue for their identity and survival. The International Land Coalition (ILC) reports the forced eviction of nearly 150,000 Maasai people from their ancestral lands in Loliondo and the Ngorongoro Conservation Area, following an eviction order issued on June 16, 2022 (Weldemichel, 2022). Similarly, the issue of land reform in South Africa deeply intertwined with food security, has been a contentious issue since the end of apartheid; with many Black South Africans still lacking secure land tenure. Historical land dispossession continues to impact economic opportunities and social stability, resulting in ongoing protests and demands for equitable land redistribution. The lack of land access remains a significant barrier to economic empowerment for many communities (Odeku, 2023).

The 2011 Law on the promotion and protection of the rights of the indigenous population in the Republic of Congo, which recognises the land rights of indigenous communities, has the potential to significantly impact food security (Survival, 2019). While there are no direct studies linking this specific legislation to food security outcomes in Congo (Brazzaville), research from neighbouring countries such as Cameroun, suggests that securing indigenous land rights can have positive implications for food access and sovereignty. Carson et al. (2018) argue that the lack of secure land tenure limits the Baka's ability to engage in traditional food gathering and production practices, thereby jeopardizing their food security and cultural heritage.

Additionally, in April 2021, the Democratic Republic of the Congo (DRC) took steps to advance indigenous communities' rights through new legislation. A critical tool to enhance food security for indigenous communities by recognising their land rights (Alexandre-Junior, 2022). However, ongoing threats and challenges to implementation highlight the need for sustained advocacy and support to ensure that these communities can fully realise their rights and improve their food security. Nevertheless, despite these legislative advancements across Central Africa, indigenous communities continue to encounter persistent threats, such as the tragic 2021 massacre of 66 Iyeke individuals in the Tshuapa province of the DRC (Alexandre-Junior, 2022). Such violence not only results in loss of life but also creates an environment of fear and instability that disrupts agricultural activities and access to food. These incidents underscore the ongoing challenges of discrimination and impunity faced by indigenous groups in the region.

In the early 1970s, the government of the Central African Republic initiated efforts to integrate the Bayaka into national society, promoting a transition from a nomadic to a sedentary lifestyle. This led to the establishment of Belemboke I, which was designated as a private domain, serving as an experimental settlement for the Bayaka over the past fifty years. In contrast, Belemboke IV has not received the same recognition or support. The Central African Republic made history in 2010 by becoming the first African country to endorse the International Labour Organisation (ILO) Convention 169, which emphasises the protection of indigenous communities' rights to their ancestral lands, regardless of formal registration. This convention advocates for the creation of a distinct land classification system that separates indigenous lands from public and private domains controlled by the state, aligning with the goal of ensuring food security and its associated benefits (Kenfack, 2018).

Following the endorsement of ILO Convention 169, the Central African Republic began efforts to integrate its principles into national legislation. However, ongoing conflicts since 2013 have impeded the implementation of the Convention and the recognition of indigenous rights (Gilbert, 2020). The selection of Belemboke I and Belemboke IV for this study is strategic, as it allows for a comparative analysis of the government's long-standing goals of integrating the Bayaka as citizens and the community's aspirations for constitutional rights. This research highlighted how the land tenure systems have contributed to making Belemboke I a model for indigenous pygmy communities capable of achieving food security, thereby significantly aiding in the attainment of various SDGs. The need to explore the disparities in land tenure systems and their influence on food security between these two communities is evident, as it can inform policy decisions and promote sustainable development strategies (Gilbert, 2020).

The exploration of land tenure systems and their impact on food security among the Bayaka people of Belemboke I and Belemboke IV is not only timely but essential. It underscores the importance of recognising indigenous land rights as a means to enhance food security and achieve sustainable development. By addressing the historical injustices faced by the Bayaka and integrating international frameworks such as ILO Convention 169 into national policies, there is potential for significant improvements in the well-being of indigenous communities and the realization of their rights. This study aims to contribute to this discourse by providing a comprehensive analysis of the relationship between land tenure and food security, ultimately advocating for the protection of indigenous rights and sustainable development in the Central African Republic.

#### **1.4. Statement of the problem**

Recognising the rights of the Bayaka communities to their ancestral lands and ensuring their access to historically used areas is essential. Emphasising their ability to achieve food security and autonomy aligns with the ideals of the rights of the indigenous peoples, promoting their well-being and self-determination. However, the contribution of land tenure systems (LTSs) to food security among the Bayaka communities of Belemboke I and Belemboke IV in Nola, Central African Republic (CAR), remains under-explored despite significant governmental efforts to enhance indigenous rights and livelihoods. Although the CAR government recognised private land tenure of Belemboke I in 1973, and signed the ILO Convention 169 in 2010, effective

implementation has been inconsistent. The problem this study set out to investigate is how land tenure systems influence food security among the Bayaka communities in Belemboke I and Belemboke IV in the Central African Republic. The study examines the land tenure challenges faced by the Bayaka people through the lens of food security, focusing primarily on the Sustainable Development Goals (SDGs) that directly relate to specific case of the Bayaka of Belemboke I and IV. The three main SDGs are (SDG 15) Life on Land, (SDG 2) Zero Hunger, (SDG 16) Peace, Justice and Strong Institutions and ILO Convention 169. While few other SDGs are briefly linked to the two key variables with the aim of promoting social transformation through future investigations.

This study explored how land tenure influences food availability, accessibility, utilisation, and stability, particularly comparing Belemboke I and Belemboke IV, thereby informing policies that could enhance food security and promote sustainable development for the Bayaka and other indigenous communities.

### **1.5. Purpose of the study**

The purpose of this study was to examine how land tenure systems contribute to food security among the Bayaka communities of Belemboke I and Belemboke IV in Nola, Central African Republic, while focusing on how it can serve as a tool of social transformation.

### **1.6. Objectives of the study**

The general objective of the study was to explore the contribution of land tenure systems (LTSs) to food security (FS) among the Bayaka of Belemboke I and Belemboke IV in Nola, Central African Republic and how it can serve as a tool for social transformation. The specific objectives of this study were to:

1. Assess the contribution of land tenure systems to food security among the Bayaka of Belemboke I and Belemboke IV in Nola, Central African Republic.
2. Appraise the impact of land tenure security on food security among the Bayaka of Belemboke I and Belemboke IV in Nola, Central African Republic.
3. Examine a social transformational framework for land tenure systems and food security among the Bayaka of Belemboke I and Belemboke IV in Nola, Central African Republic.

### **1.7. Research questions**

1. What are the contributions of the land tenure systems to food security among the Bayaka of Belemboke I and Belemboke IV in Nola, Central African Republic?
2. How does land tenure security impact food security among Bayaka of Belemboke I and Belemboke IV in Nola, Central African Republic?
3. What social transformational framework for land tenure systems and food security can be established among the Bayaka of Belemboke I and Belemboke IV in Nola, Central African Republic?

### **1.8. Significance of the study**

The propositions and recommendations of the study may constitute the basis for policies that will permit the Central African's government to achieve its goal of integrating the Bayaka into national development programs. Moreover, the research findings could enable the State to know if LTSs are determinants for FS in relation to its availability, approachability, utilisation, and steadiness, with a focus on how it can serve as a tool of social transformation of the Bayaka communities of Belemboke I and Belemboke IV in Nola. Consequently, the enhancement of living conditions for both the Bayaka and the neighbouring communities could be facilitated by social transformation. The study findings might also help improve FS among the Bayaka of Belemboke and the environs by refining the capacity of natural systems and enhancing the sustainability of innovative agricultural programs. Consequently, this could contribute to the preservation of the biosphere.

### **1.9. Assumptions**

1. The researcher was immersed in a continual participant observation to unravel the participants have experienced the discrepancy in land acquisition and FS between the two Bayaka villages of Belemboke I and Belemboke IV, in order to assert the credibility of the study.
2. The study assume that participants will understand the questions and consequently cooperate and provide accurate, thorough, and true information that will be useful in making conclusions and generalisations.

### **1.10. Scope and delimitations of the study**

The study covered two villages of Belemboke I and Belemboke IV. The distance of 3 km on foot that separates the two villages motivates the choice of the scope. The study was limited on documents that covered what concerns the land rights of the Bayaka. The difference in the lifestyle of the inhabitants of the two villages affected the collection of data. While the Bayaka of Belemboke I were easily accessible, the researcher was obliged to work with those who were available in Belemboke VI. The confidence of participants from the Belemboke I community where the Catholic Mission is present facilitated the findings in comparison to those of Belemboke IV people who consider themselves to be less privileged because of the Bilos who can intimidate them for denunciations. They were not though afraid of the reprisal or repercussions from the masters in case they disclose any information or treatment that contributes to their inability to attain food sufficiency.

This study was delimited to the young and adult Bayaka who are recognised as members of the two communities and could share information on the existing difference in terms of land issues in line with the availability, accessibility, and utilisation of food. This is pertinent, because other Bayaka people from neighbouring communities outside the fixed boundaries could infiltrate with the wrong conception of being remunerated.

### **1.11. Chapter summary**

This chapter presented an overview of the subject that was studied, from a global, continental to a local level. The study's significance and justifications were offered. The chapter also explored the connection between the LTSs and the attainment of FS concerning its availability, accessibility, and utilisation. This chapter finally, provided the framework for the second chapter on the literature review for this study.

## CHAPTER 2: LITERATURE REVIEW

### 2.1 Introduction

This chapter presents the theories on which this study was anchored, and the empirical literature as well. It then focuses on the research's major concepts such as: Land Tenure, Food Security, and the Bayaka as Indigenous people in the context of sustainable development and social transformation. Further, it highlights the theoretical framework of the study as the basis for the formulation of a working conceptual framework for this research. The research gap identified from the literature reviewed concludes the chapter.

### 2.2. Theoretical review

The theories chosen for this study were functional differentiation theory, the Lockean *provisio* theory and the "*Zo kwe Zo*" world perspective. The first theory examined how the Bayaka of both villages in this study benefited from their right of acquisition of a land tenure regime to ensure their livelihood. The second theory helped to establish the discussed variables on the principle of justice and served as tools of social transformation. The "*Zo kwe Zo*" world perspective complemented the two theories and led to the achievement of sustainable food sufficiency among the Bayaka.

#### 2.2.1. Theoretical review on Land Tenure Systems (LTSs)

A study by Takeuchi (2022), explored the diverse outcomes of land reforms in Africa since the 1990s, which aimed to enhance land rights and reduce inequality. It proposes a comparative analysis framework to understand why similar policies yield different results across countries. Key theories include the commodification of customary lands and the complex relationships between the state and traditional leaders, which can manifest as collusion, tension, or subjugation. The study highlights that while some nations, like Rwanda and Mozambique, have strengthened state control through reforms, others, such as Ghana and Zambia, have seen traditional authorities gain influence, underscoring the need for deeper research into these dynamics. This study was grounded in theories that align with the inclusiveness of the Bayaka in diagnosing existing problems and potential solutions.

Hull et al. (2019) presented and tested a classification system for land reform theories to support land managers and policymakers in implementing suitable initiatives within their specific contexts. Their proposed theoretical framework can be utilised by land restitution programs primarily operating in the global South. Through case studies from Nigeria, Mozambique, and South Africa, combining primary and secondary evidence, the study aimed to situate the standing point of Belemboke I and Belemboke IV in relation to replacement theories and adaptation theories when it comes to land reform theories.

### **2.2.2. Theoretical review on Food Security (FS)**

Rimal (2018) in an ethnographic study, *A grounded theory of FS in Nepal: Surviving market fundamentalism*, employs systems thinking, grounded theory, and ethnography to explore agricultural industrialisation, social and cultural transformation, and biodiversity. Participants highlight the significance of intergenerational socio-ecological experiences in maintaining biodiversity. This study's hypotheses aimed at enhancing sustainability and development discussions on various scales. The same study recommends using heritage seeds and avoiding industrial agrochemicals in policy-making.

While applying *A Lockean Theory of Climate Justice for Food Security*, Inoue (2023) argued that the Lockean proviso justifies tackling food security amid climate change. The study proposed a global food security plan ensuring fair access to greenhouse gas sinks. It posits four key points: states' entitlement to the Lockean proviso, the right to food systems that meet essential needs while considering others' needs, fostering intergenerational and global justice, and recognising states' efforts in reducing GHG emissions as rightful labor outcomes. In another study, Igbokwe-Ibeto (2019) examined climate change, food security, and sustainable human development in Nigeria through dependency theory. The author warned that without substantial mitigation of climate change impacts and enhanced food production, Nigeria faces worsening food crises and stalled human development. A key recommendation was conducting environmental impact assessments before, during, and after industrial activities. In this study, functional differentiation, the 'Zo Kwe Zo' world perspective, and the Lockean *proviso* theories, were applied to support the research framework.

### **2.2.3. Functional Differentiation Theory**

It is a theory that emerged from sociological theory and was propounded by Niklas Luhmann in 1982. The core idea behind Luhmann's functional differentiation theory is that societies lack unity because they are divided into several subsystems that are each specialised in carrying out particular or separate roles for their societies (Gonçalves, 2021). This theory is important because it emphasises equal autonomy of social subsystems (Wenzlaff, 2019). It can be used to understand social problems like land tenure issues (Chigbu, Paradza, et al., 2019). This functionalist perspective is utilised, for instance, in the context of law to identify prospects for programming legislation to address the issues of globalisation in a more positive way (Hanna, 2018).

In application, the functional differentiation theory would argue that the Bayaka, as distinct subsystems within societies, exhibited significant differences and should have been acknowledged as such due to the fact that they primarily performed various functions in their individualities, as well as at the household, community, and regional levels. The central tenet of Luhmann's theory was that "society is differentiated into various self-referential functional subsystems which operate according to their own particular logic without being subordinated to any central unit" (Chigbu et al., 2019). This study analysed the experience of the Bayaka on land access and tenure security issues through the lens of subsystem differentiation in the Central African Republic.

The theory was applied as follows: Nola, in the Central African Republic, is not a homogenous region, and many communities within the region are not homogenous either. Thus, the Bayaka in Belemboke I and Belemboke IV did not have the same LTS experiences (Chigbu et al., 2019). Customary land tenure could be advocated to uphold the constitutional rights of the Bayaka as indigenous people. While this theory described the societal structure and the place of the Bayaka, it needed to be complemented by another theory that embodied the foundational and national aspirations of the people of the Central African Republic. This combination enabled a concrete application that facilitated social transformation among them.

### **2.2.4. The “*Zo kwe Zo*” world perspective**

The “*Zo kwe Zo*” principal was propounded by the founding father of the Central African Republic, Barthélemy Boganda in 1958. Boganda advocated for the end of forced labour, women and children labour, corporal punishments, as well as for other exactions (Kalembe, 2017). He

proclaimed the Central African Republic within the French community on the 1st of December 1958. His political program revolved around five verbs namely, to feed, to heal, education, accommodation and clothing.(Kossi, 2020). Boganda further installed a national dictum that reflected his attachment to upholding human rights as “*Zo Kwe Zo*” which means “Everyone is a Human”. This is depicted in the national coat of arm and it reads; Unity, Dignity, Labour (Kalemba, 2017).

The “*Zo kwe Zo*” world perspective could be considered the Central African Republic's version of the *Ubuntu* perspective that was propounded by Stanlake Samkange in 1980, referring to how Africans viewed themselves and their interaction with the environment as well as with spiritual beings (Mugumbate & Chereni, 2020). Boganda’s human rights approach, stressed in the “*Zo kwe Zo*” principal, constituted the point of convergence on which the LTSs and its effects on FS among the Bayaka of Belemboke I and IV could be addressed. This philosophical principal was characterised by three maxims: human relations, sanctity of life, and people-centered status. It integrated the individual, family, community, environmental, and spiritual levels. The individual level consisted of the body, the mind, knowledge, inheritance, possession, and inventions (Willmore et al., 2022).

It is important to note that the “*Zo kwe Zo*” world perspective also shared in the critique of the *Ubuntu* principal. The *Ubuntu* world perspective, is highly criticised for overemphasising the role of the community at the expense of the individual and practical reason, which were equally important in African traditional society (Kayange, 2020). Despite the criticism, the “*Zo kwe Zo*” principle is deemed appropriate for this study as it embodies grassroots development theory. It emphasises the empowerment of local communities, honours traditional values, and fosters sustainable, people-centered advancement that benefits everyone in society.

### **2.2.5. The Lockean *Proviso* theory**

The Lockean *proviso* is a feature of John Locke's labour theory of property, written in 1689. It states that whilst individuals have a right to homestead private property from nature by working on it, they can do so only "at least where there is enough, and as goods, left in common for others" (Locke, 2016, 2020). It is a mean by which human actions are held accountable to social standard and ethics. It can also be defined as the method through which the most avaricious and morally degraded individuals are prevented from pulling the rest of humanity down to their standards

through a competition to reach the lowest point. This in turn prevents them from causing unbearable suffering for the rest of the population.

With a special focus on social justice, the Lockean *proviso* theory was used as a relevant principle of justice for land and FS. Drawing from Inoue (2023), the Lockean *proviso* theory reasonably enjoined that a state had a right to a FS that secured its citizens' basic needs, and a duty to meet the basic needs of other people. Thus, the Lockean *proviso* theory was deployed in this study as a principle of both cultural justice and intergenerational justice for land and FS for the Bayaka in the Central African Republic.

### **2.3. Empirical literature review**

Considering the fact that Land Tenure Systems (LTSs) is at the heart of many of the Sustainable Development Goals (SDGs), this section presents a review of previous studies on the contribution of LTSs to Food Security (FS) as well as the impacts of Land Tenure Security (LTS) on Food Security (FS) in the light of the various SDGs in line with the research objectives.

#### **2.3.1. The contribution of Land Tenure Systems to Food Security among the Bayaka**

Alden (2018), examined collective land ownership across 100 countries, focusing on lands claimed by social communities. The study found that indigenous peoples, a small segment of traditional landowners, are advancing territorial claims in Latin America, Canada, Australia, and New Zealand. The 1989 UN Convention (ILO 169, Article 14) recognises their rights to traditionally occupied lands and mandates governments to identify and protect these lands. The Central African government is committed to this convention which states that:

The rights of ownership and possession of the peoples concerned over the lands which they traditionally occupy shall be recognised. In addition, measures shall be taken in appropriate cases to safeguard the right of the peoples concerned to use lands not exclusively occupied by them, but to which they have traditionally had access for their subsistence and traditional activities. Particular attention shall be paid to the situation of nomadic peoples and shifting cultivators in this respect. (ILO 169, Article 14).

This citation, constitutes the international legal base on which this study on LTSs and FS among the Bayaka of Belemboke I and Belemboke IV could be justified.

Keovilignavong and Suhardiman (2020) explored the interconnectedness between food security and land tenure security as perceived by farming households in Laos. The main findings of this study revealed a strong connection between food insecurity and land tenure insecurity. However, it was claimed that food insecurity does not necessarily lead to land tenure insecurity. This finding aligns with the empirical study by Singirankabo et al. (2022) in Rwanda, which showed that the agricultural output of major crops did not significantly correlate with the farmland tenure security index. Instead, variables related to the agricultural intensification program had a greater influence on crop yields, even though they potentially compromised land tenure security.

Similarly, the research by Oduniyi and Chagwiza (2022) in Mpumalanga, South Africa, indicated that 68% of farmers had access to enough food, and 71% of the 250 respondents supported the Sustainable Land Management Practices (SLMP). This suggests that while land tenure security is important, other factors such as agricultural practices and policies also play a crucial role in ensuring food security. Similarly, Mawere et al. (2022) demonstrated how communal tenures in the South African region of Vhembe might improve food security. These findings suggest that secure land tenure can contribute to food security by providing farmers with the stability needed to invest in their land and improve agricultural productivity.

Contrary to these findings, other scholars have argued in favor of Article 14 of the 169 ILO convention, which emphasises the importance of land tenure security. For instance, Akafari et al. (2021) conducted a study on the effects of land appropriation for gold mining in Ghana. The research revealed that this practice has significantly altered the country's traditional land tenure systems, leading to a shift from agriculture-based livelihoods to non-agricultural activities. This has resulted in a new class of farmers in rural areas who either lack access to land or face restrictions in land ownership.

The findings from these studies could contribute to achieving several Sustainable Development Goals (SDGs). For example, Goal 13 (Climate Action) emphasises promoting mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing states, including focusing on women, youth, and local and marginalised communities. Secure land tenure can support these efforts by providing a stable foundation for sustainable land management practices.

In Cameroon, Sama (2022) examined the legal framework's ability to protect indigenous peoples' rights to own, use, develop, and inhabit their ancestral lands and territories. The study revealed that constitutional protections for indigenous peoples' rights are weak, leaving them vulnerable to human rights abuses by business enterprises, especially in states with weak governance systems. This finding aligned with a qualitative study on the Baka Pygmies of Cameroon by Permunta (2019), which highlighted the effects of land limits on the delivery of social services. The study emphasised that access limitations have changed the dietary preferences and consumption patterns of the Pygmies due to differences in the availability of fauna and edible fruits.

These empirical studies from Cameroon corroborated the observed situation of the Bayaka in Belemboke I and Belemboke IV and could be linked to SDG Goal 15 (Life on Land). Target 15.2 promotes the implementation of sustainable management of all types of forests, halting deforestation, restoring degraded forests, and substantially increasing afforestation and reforestation. Additionally, targets 15.7 and 15.12 stress taking urgent action to end poaching and trafficking of protected species of flora and fauna and enhancing global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities. They aligned with other studies that agreed on the significance of indigenous lands, knowledge, and communities for achieving the targets of SDG 15, they differ in their specific focus and approach. Garnett et al. (2018) and Estrada et al. (2022) primarily concentrate on biodiversity conservation, while Scheidel et al. (2023) examine the impacts of development projects on indigenous communities. The Cambridge University Press chapter takes a broader perspective, exploring the role of forests in sustainable development.

In the Central African Republic, there are no clear provisions for collective landholding. Environmental protection associations have criticised the lack of recognition of customary rights and called for the government to make provisions for the restoration of people's ownership of land, whether individual or collective. The current legislation distinguished between the public domain and the private domain, with the state presumed to be the owner of lands not owned by third parties (Pennes, 2015; Kenfack, 2018). This situation has implications for the land tenure security and

food security of indigenous communities, such as the Bayaka Pygmies, who have historically faced challenges in securing their land rights.

Going by the Article 38 of Law Nos. 63-441 of January 9, 1964, on the National Domain in the Central African Republic; Belemboke I village created by the Bayaka Pygmies with the assistance of a Belgian missionary catholic priest, Fr. Michel Lambert in 1973 is, therefore, considered a private property approved by the declaration of the emperor Jean-Bedel Bokassa. Belemboke IV is an annex village that shared in the privilege (Guadeloupe, 2018). Furthermore, President André Kolingba, who was head of state at the time, endorsed Bayaka Pygmies' land ownership and FS rights during a ceremonial visit to Nola in March 1987. The president's historical declaration highlights two points:

When a group of pygmies choose to create their own village, the villagers will not settle among them. We will leave at least 3 km between the Pygmy dwellings and the first villagers." The second is regarding the farms or any portion of land used by the Bayaka. In view of attaining self-sufficiency in agriculture, the non-indigenous are asked not to take back the land previously cleared by the pygmies. These, in order to respect the necessary cultivation areas, will not give up their fallow land" (Guadalupi 2018).

The above declaration was situated in the context of the Central African government's project to promote the respect of the integral rights of Bayaka as the indigenous people especially in terms of ensuring their food self-sufficiency. This points to the crucial need to promote concrete steps, such as laws and policies that promote the integration of indigenous property rights on land into formal justice institutions, and to increase tenure security for indigenous peoples in CAR Sama (2022). Enhancing land tenure security can enhance the human rights (their rights to food, shelter, water, development, and self-determination). Consequently, it serves as one way of achieving the goal 16 (Peace, Justice and Strong Institutions). Especially in its target 16.3 that promotes the rule of law at the national and international levels and ensure equal access to justice for all. Also in target 16.7 which emphasises on ensuring responsive, inclusive, participatory and representative decision-making at all levels (Breuer et al., 2019).

In a nutshell, while land tenure security (LTS) is crucial for food security (FS), other factors such as agricultural practices, policies, and legal frameworks also played significant roles.

Ensuring secure land tenure can support sustainable land management practices and contribute to achieving various SDGs, including climate action and life on land. However, it is essential to address the broader socio-economic and legal contexts to fully realise the potential benefits of secure land tenure for food security.

### **2.3.2. Land Tenure Security (LTS) and Food Security (FS) among the Bayaka**

Given the fact that LTS is the assurance that one's land rights will be respected and upheld by others, especially when faced with particular difficulties. This section of work appraised the level of LTS and the dimension of FS.

#### **2.3.2.1. Establishing the Level of Land Tenure Security**

Nara et al. (2020) conducted a study in Ghana that revealed subsistence farmers' food security is variably threatened by local land governance issues and ineffective national land regulations. Supporting this, Ringo (2018) found in Tanzania that leased land tenure improved crop production, access to financing, and reduced land conflicts. Similarly, Sanusi et al. (2021) in Nigeria discovered that communal land tenure systems and inheritance significantly influenced rice production, though only 62.18% of producers achieved satisfactory productivity.

In Zambia, Nkomoki et al. (2018) noted that land ownership significantly affected the adoption of sustainable agricultural practices (SAP). Households with traditional land tenure were less likely to adopt planting basins, agroforestry, and agricultural diversification by 17.4%, 17.2%, and 9.1%, respectively, compared to those with statutory tenure. Appiah et al. (2019) in Ghana highlighted that the rising demand for residential and commercial land drives agricultural land use conversions, reducing agricultural land availability.

These studies collectively discussed the growing demand for land for non-agricultural purposes, impacting agricultural land use negatively. They also examined land acquisition through inheritance, communal land tenure systems, and ownership through purchase, underscoring the importance of land tenure systems (LTSs). However, none address the situation of the Bayaka of Belemboke. This study aimed to fill this research gap by investigating the most suitable land tenure system for the Bayaka community.

### **2.3.2.2. The Dimension of Food Security**

This section reviewed literature on food security (FS) and the indicators used to measure it. The literature on food security (FS) and its indicators reveals several strengths and weaknesses across various studies. In West Bengal, India, a quantitative analysis showed a modest decrease in nutritional disparities among children, indicating progress but highlighting the National Food Security Act's limited impact on key nutritional determinants for children under five (Nara et al., 2020). This suggested a need for more effective policy implementation and localised interventions. Similarly, Drysdale et al. (2021) in iLembe, South Africa, identified a strong link between persistent hunger and malnutrition, particularly among urban households, which pointed to the necessity of targeted urban food security strategies during extreme weather events like droughts.

Cordero-Ahiman et al. (2018) found that 54.47% of indigenous households in Mexico's Sierra Tarahumara face low food access, primarily coping through rationing and short-term food supply increases. This indicated a critical vulnerability that necessitates long-term sustainable solutions. Patterson et al. (2021) revealed an alarming 97% food insecurity rate among the Batwa people in Uganda, emphasising the dire need for effective interventions in such communities. Furthermore, Hall et al. (2019) demonstrated that higher forest cover in rural southern Malawi leads to better household diet quality and vitamin A adequacy due to the consumption of wild plant foods. This finding was echoed by Fungo et al. (2020), who showed that wild forest foods significantly contribute to FS and dietary diversity in rural populations near forest concessions in DR Congo, Cameroon, and Gabon. These studies underscored the crucial role of forest foods in ensuring FS, highlighting a valuable area often overlooked in food security policies.

A key area of agreement among scholars was the vital role of traditional and indigenous land management practices in promoting food security (FS) and preserving biodiversity. Viana et al. (2022) argued that these practices are crucial for achieving Sustainable Development Goal 2 (SDG 2) but are often overlooked in favor of commercial agriculture, which could lead to land grabbing and environmental degradation. The current study aimed to fill gaps concerning the FS of the Bayaka people in Belemboke I and IV, Nola, Central African Republic, using qualitative methods to assess FS comprehensively.

### **2.3.3. A Social transformational framework for land tenure and food security among the Bayaka**

This section discussed land tenure and food security frameworks and policies, and the prospect of offering a transformational one for Bayaka communities in Central Africa Republic. Liu et al. (2020) conducted a quantitative study in China to evaluate land use efficiency (LUE) with a focus on sustainable land use and regional expectations. They introduced a new analytical technique using a food-economy-ecology paradigm to assess LUE. Their findings indicated that Jiangsu province shows considerable potential for sustainable land use, with LUE values of 54.15% in food production, 85.56% in economic development, and 54.95% in ecological conservation, all surpassing the expected values. In Latin America and the Caribbean, legislators received a legal brief discussing the establishment of framework laws concerning the right to sufficient food, outlining broad principles and responsibilities for subsequent legislation (da Silva, 2020). Another brief focused on creating a favorable legal environment for responsible investments in agriculture and food systems, emphasising the importance of upholding legitimate rights to land, fisheries, forest tenure, and access to water. The brief aimed to guide legislators in promoting responsible investment practices and safeguarding FS and poverty alleviation.

Hendriks et al. (2019) examined changes in official food security (FS) policies between 2010 and 2018 in 11 African countries, including Benin, Burkina Faso, Ghana, Guinea, Guinea-Bissau, Cote d'Ivoire, Liberia, Malawi, Nigeria, Niger, and Togo. The study highlighted the complex nature of policy contents in agriculture and exposed a lack of clarity and definition regarding the roles of policy, implementation strategies, and action plans in addressing FS.

In addition, Chigbu et al. (2019) studied land use consolidation in Nyange Sector, Musanze District, Rwanda, to improve FS through tenure-responsive land-use planning. They aimed to show how land consolidation affected local FS and how tenure-responsive planning could enhance FS. This aligned with the study of Tessema (2019) in Ethiopia, which investigated the impact of effective land certification on tenure security and agricultural productivity, changes in land use and land cover, and the FS status of individuals involved in Sustainable Land Management (SLM).

Furthermore, Kumeh et al. (2022) introduced the concept of FS corridors (FSCs) for integrated landscape management, helping communities near forest reserves balance FS and conservation goals. Keovilignavong and Suhardiman's (2020) study in Laos emphasized shifting

the perspective on land beyond its role solely in agricultural production or environmental preservation, highlighting the need to prioritise the livelihoods of people by positioning them at the center of land administration.

Finally, on March 12, 2020, the parliamentary alliance for FS and nutrition was officially formed in Bangui, Central African Republic. Its goal was to enhance legislators' knowledge and capabilities on global and regional FS and nutrition, the multi-sectoral aspects of nutrition, the current state of FS and nutrition in the country, strategies for control, and the creation of parliamentary allies for food and nutrition security. However, an incident involving "Mama J" arose, as she occupied a significant portion of land intended for the Bayaka. After four years, the Bayaka leaders successfully obtained a court order for her eviction (Guadalupi, 2018). This situation underscores the need for a legal framework to address such issues and protect marginalised communities' rights.

The research findings discussed above provide valuable insights for guiding decision-making and implementing effective strategies to achieve Sustainable Development Goals (SDGs) related to FS, highlighting the importance of sustainable land use, clear policies, and protecting the rights of vulnerable populations.

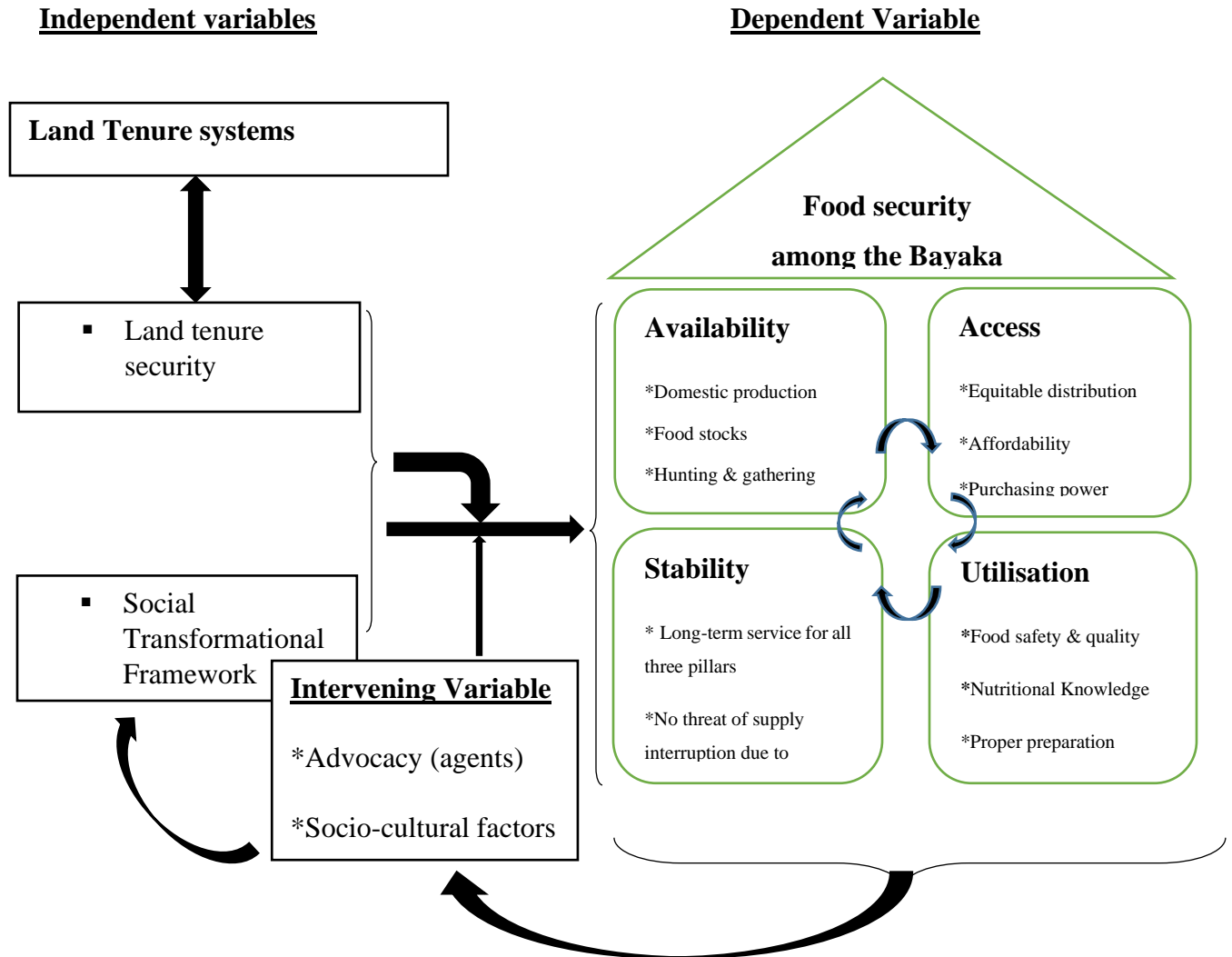
#### **2.3.3.1. Land Tenure Systems as tool of social transformational among the Bayaka**

Social transformation, as defined by Pierli and Selvam (2017), involves processes where individuals and groups bring about large-scale changes aimed at enhancing quality of life. This concept includes various social processes and agents, with the ultimate goal being the wellbeing of individuals and groups within a society. It is in the light of this definition that for sustainable social transformation in regions like Belemboke I and Belemboke IV, it is crucial to anchor customary land tenure systems in law. This legal backing can enable indigenous populations to achieve food sufficiency, strengthen local land administration for proper resource management, and improve community livelihoods. However, the concept of land tenure needs to be examined from the perspective of indigenous communities like the Bayaka to attain the desired goals. The following literatures illustrate that the interconnectedness of SDGs highlights the importance of a holistic and context-specific approach to achieving sustainable development goals among the Bayaka.

Studies by Agunyai and Amusan (2023), Ashukem (2022), and Viana et al. (2022) indicate that land grabbing in Africa significantly hampers efforts to achieve Zero Hunger (SDG 2), focusing on the power dynamics and economic interests driving this issue. Additionally, scholars like Benavot et al. (2022), Do et al. (2022), and Kanowski et al. (2019) emphasise the importance of recognising diverse knowledge systems and promoting environmental education (SDG 4: Quality Education). Furthermore, Enaifoghe and Durokifa (2023) and Leal Filho et al. (2023) discuss the barriers women face in accessing leadership roles and the interconnectedness of gender equality with other development goals (SDG 5: Gender Equality). Similarly, Kreinin and Aigner propose a shift towards sustainable work that prioritises well-being over economic growth (SDG 8: Decent Work and Economic Growth). Furthermore, Szetey et al. (2021) and Bandyopadhyay (2021) emphasise the importance of context-specific approaches to climate action (SDG 13: Climate Action). Vandome and Vines (2018), Leavitt et al. (2020), and Sjöstedt et al. (2021) highlight the role of community engagement in conserving terrestrial ecosystems (SDG 15: Life on Land). Secured land tenure systems among the Bayaka can significantly contribute to food security and social transformation, aligning with various SDGs. By addressing land tenure issues, this study could contribute to scrutiny a framework that supports sustainable development, respects Indigenous knowledge, and fosters community resilience.

The comprehensive social transformation framework for the right to adequate food, developed through inclusive consultations, could serve as a valuable tool for implementing and overseeing food security and nutrition. Achieving this requires coordination among implementing organisations, local governments, indigenous peoples, and communities with customary tenure systems. This framework aimed at filling the research gap and provided a structured approach to promoting FS and ensuring the right to adequate food, ultimately contributing to sustainable development and improved quality of life for all.

## 2.4. Conceptual Framework



**Figure 1. Conceptual framework**

Figure 1 is a conceptualisation of food security (FS) among Bayaka as the dependent variable which is influenced by land tenure security (LTSs) and social transformational framework (private and the customary LTSs) (Kenfack, 2018). The researcher sees three facts from figure 1: First, that LTSs, depending on their availability, can encourage the Bayaka to be more innovative by investing time, effort, and money to increase the productivity. The combination of agrarian and the hunting and gathering mode will increase the availability of food produced on land. The researcher first linked LTSs to the four FS aspects (availability, access, stability and utilisation).

Second, the private and customary LTSs implicit in the Social Transformational Framework demonstrates how the security of land guarantees Bayaka's capacity in equitable distribution, affordability as well as purchasing power. All these are possible because food is gathered and income-generating crops and resources are grown and harvested thus, facilitating FS. Third, the utilisation of both the private and customary LTSs demonstrates the importance of tenure security for access to qualitative food based on the indigenous and modern nutritional knowledge. This takes into consideration water, firewood, and food supplies that Bayaka people frequently use for sanitation, hygiene, ensuring that food is prepared and consumed in a nutritious way. Finally, stable land tenure guarantees that Bayaka will always have access to the lands they utilise to grow food and earn money now and, in the future, thus introducing the concept of sustainability where the protection from land appropriation is particularly crucial.

The intervening variables, on the one hand, refer to the transformational agents. This consist of the Bayaka and the presence of any group such as the Catholic pastoral agents that advocate for a better livelihood of the Bayaka. On the other hand, the intervening variable takes into consideration the socio-cultural factors that might facilitate or hamper the process of FS among the Bayaka. The arrow that goes from the food security to the intervening variable indicates the possibility of how ensured FS can influence the socio-cultural factors that obstruct the evolution of the Bayaka. The last arrow pointing to the social transformational framework affirms the need to advocate for that system for both the government and the indigenous people to reach their aspirations and goal respectively. It is at this juncture, that the Ubuntu principal in its Central African Republic version of "*Zo kwe Zo*" comes into play alongside with the *Lockean provisio* theory and the functional differentiation theory.

## **2.5. A Critique of existing literature**

The review of existing literature revealed a complex relationship between land tenure security (LTS) and food security (FS), emphasising their relevance to Sustainable Development Goals (SDGs) such as SDG 1 (No Poverty), SDG 2 (Zero Hunger), and SDG 15 (Life on Land). However, the reviewed studies indicate that LTS and FS are not always interdependent, as land tenure insecurity can sometimes push farmers to seek alternative livelihoods (Holland et al., 2022). The literature also acknowledged state restrictions on forest communities' access to protected areas, leading to land conflicts, but lacked a thorough examination of the transformative potential

of social change and the unique perspectives of Indigenous communities like the Bayaka. While dietary shifts due to restricted forest access are noted, a deeper investigation into the Bayaka's customary land rights and sustainable practices is necessary.

In summary, while the existing literature offered valuable insights into LTS, FS, and their connections to various SDGs, there is a need for a more nuanced understanding of the transformative potential of social change, the perspectives of Indigenous communities, and the integration of sustainable practices. The studies aligned with the SDGs present diverse perspectives and approaches, highlighting the importance of context-specific strategies, stakeholder engagement, and holistic approaches to achieving sustainable development. However, further research is needed to explore these areas in greater depth, particularly regarding the unique needs and practices of Indigenous communities like the Bayaka.

## **2.6. Research gap**

The review identified a significant research gap in exploring the transformative potential of social change and the unique perspectives of Indigenous communities like the Bayaka in addressing land tenure security (LTS) and food security (FS) challenges. While acknowledging state-imposed restrictions on forest communities, the literature lacked examination of how social change and the Bayaka's customary land rights and sustainable practices could inform more inclusive approaches to LTS and FS. The studies highlighted the relationship between LTS and FS, emphasising their relevance to SDGs 2, and 15, but they overlooked socio-cultural dimensions and Indigenous knowledge via the lens of SDG 16. A deeper investigation into the traditional ecological knowledge of the Bayaka and sustainable resource management could provide valuable insights for achieving the SDGs that align with land tenure and food security. Additionally, there is a need for a comprehensive examination of how social transformation processes, such as shifts in power dynamics, community empowerment, and participatory decision-making, could create more equitable and sustainable solutions to LTS and FS challenges. This study set out to fill in that identified gap.

## **2.7. The outcome of the study**

The researcher expects that securing land tenure rights for the Bayaka through private and customary systems would significantly enhance their food security. This includes increasing food availability by integrating traditional hunting-gathering with agriculture, improving access to food

through equitable distribution and income generation, and allowing better utilisation of food with indigenous and modern nutritional practices. Additionally, stable land tenure will ensure ongoing access to productive lands, ensuring long-term food security. The study also examined the role of advocacy groups and socio-cultural factors, proposing a social transformational framework based on the philosophical principal of "*Zo kwe Zo*" and the two complementary theories to achieve sustainable food security and community goals.

Additionally, the outcome of the study could revive the role of the Bayaka as natural forest guardians, enabling their full participation in climate action through an adapted educational system. This renewed approach can restore balance in integrating the Bayaka's traditional knowledge and sustainable practices into environmental conservation efforts, fostering a harmonious relationship between communities and nature.

## **2.8. Chapter summary**

This chapter presented the theoretical review, summarising a couple of past research theories and detailing three selected theories for the current study. The empirical literature review highlighted the role of land tenure security (LTS) in Sustainable Development Goals (SDGs) and its impact on food security (FS). The food security section reviewed FS indicators, while a social transformational framework for the Bayaka focused on LTSs and FS policies. A critique revealed the intricate LTSs-FS relationship and identified a research gap concerning indigenous perspectives. The outcome of the study anticipated an enhanced Bayaka food security and environmental conservation through secure land tenure rights and integrated traditional knowledge. The next chapter outlined the comprehensive methodology employed in this study. The next chapter presents the research methods employed in this study.

## CHAPTER 3: RESEARCH METHOD

### 3.1. Introduction

This chapter addresses various aspects such as: research design, the target population and sampling methods. The chapter also outlines the data collection tools and procedures that were employed, addresses the testing of trustworthiness and credibility of the tools, presents data analysis techniques, and states the ethical considerations involved in the study.

### 3.2. Research design

A research design is a procedure through which a method is executed in a particular study. In other words, it ensures the operationalisation of the conceptual frameworks, the answering of research questions, the meeting of objectives and/or the testing of hypotheses. Its objective should be to give adequate details to make the study transparent, allowing readers to evaluate it in light of the stated research objectives and fostering replication (Sovacool et al., 2018). The study employed an ethnographic approach. According to Creswell and Creswell (2018), an ethnographic study is one that focuses on depicting people's everyday experiences through observation and interviews with pertinent parties in order to develop a comprehensive image of the subject of study. It aims to draw conclusions from data that demonstrate connections. It may be described as having one aspect existing that has caused the emergence of another aspect. (Bairagi & Munot, 2019).

Also, Nassaji (2020) emphasised that qualitative research should exhibit robustness, be well-informed, and thoroughly documented. While qualitative research shares naturalistic and interpretive qualities with quantitative research, it also adheres to a systematic approach involving problem identification, data collection, analysis, explanation, evaluation, and interpretation. Maintaining rigor and ensuring quality are vital aspects of conducting qualitative research (p. 427). It is important to recall at this juncture, that two communities were selected in order to highlight the distinctions between them and the pressing need to put Convention 169 into practice in order to advance the relevant Sustainable Development Goals (SDGs).

Collection of data on LTSs and FS among Bayaka was done in an ethnographic way of dealing with the study within a diagnostic structure. Data samples that fitted or belonged to the association category that the researcher intended were obtained. Many scholars are interested in using various sampling methods, including random, cross-fold, and others. When conducting this

type of research, a diverse range of samples is required (Bairagi & Munot, 2019). It is important to note that by virtue of his position as a pastor, the researcher in this study also served as an important tool. The researcher plays a diverse role, a participant observer, reflective practitioner, adaptable data gatherer, interpretive analyst, and cultural mediator. By engaging deeply with the community, practicing critical self-reflection, using flexible data collection methods, conducting thorough analysis, and facilitating clear communication, the researcher becomes a key instrument for collecting, understanding, and sharing detailed insights about the LTSs and the FS that is being studied among the Bayaka.

### **3.3. Location of the study**

The field study was conducted in the villages of Belemboke I and Belemboke IV. The village of Belemboke I is located 40 km south-west of the administrative town of Nola, in Sangha-Mbaere which is one of the 16 prefectures in Central African Republic. It is noted that both villages cover a geographical area of more than 37 square kilometres with 27 square kilometres being reforested. For the purpose of this study, the entire 8 quarters in Belemboke I and the entire 2 quarters in Belemboke IV were covered. The two villages are approximately made up of a population of 3000 people. According to the records at the local government office in Nola, the youth make up 60 % of the population (Belemboke, Census 2019). The indigenous of Belemboke have adopted a sedentary lifestyle as they combine the practice of farming, animal rearing as well as hunting and gathering. The researcher got more precision on the data concerning the village of Belemboke IV, which is a 3 km walking distance from Belemboke I.

### **3.4. Target population**

The target population was the complete group of respondents who met the required set of criteria, or the entire group of persons to whom the study's findings was applied (Yu & Eng, 2020). According to the consulted documents of the Health Centre in Belemboke I, the population of Belemboke I is estimated at approximately 2500 while that of Belemboke IV is slightly above 500. In this study, the total population of both villages was estimated at 3000.

### **3.5. Sample technique and sample size**

The sampling frame, techniques for sampling, and sample size are discussed in this section. The participants demographic in Belemboke I and Belemboke IV are presented separately to illustrate the required details.

#### **3.5.1. Sampling frame**

The sampling frame is an exhaustive list of all the sampling units from which the researcher intends to select the sample (Mishra & Alok, 2022). Men and women between the ages of 18 and 70 who were able to comment on land tenure and access to food made up the sampling frame for this study. In Belemboke I due to the larger number compared to Belemboke IV, the age group was divided in two. There were participants of 18-30 years and those of 31-70 years. The researcher consulted recorded documents by the health centre of village to obtain a cross-sectional view of the nutritional level with other collected data.

#### **3.5.2. Sampling techniques**

Sampling is the process of selecting individuals from the accessible population, such as people and organisations, in order to fairly generalise results to the target population (Berndt, 2020; Gupta, 2021). Snowball sampling technique was used to select 10 young men of 18-30 years, 10 men of 31-70 years, 10 young women of 18 -30 years, 10 women of 31-70 years in Belemboke I. In Belemboke IV, 7 women and 8 men were selected to constitute the participants targeted from both settlements.

Due to the limited number of non-indigenous people that are authorised to reside among the Bayaka, purposive sampling was used to select the nun in charge of the health centre and the school head teacher that served as a participant observer. The priest in charge and the local authority in the nearby village of Sced that oversees the Bayaka villages also served as key informants. This added up to be 59 participants and ensured that the different layers were fairly represented resulting in accuracy of the results by reducing representation bias. Table 1 illustrates how sampling was done in this study.

**Table 1. Number of persons chosen in Belemboke I and Belemboke IV**

<b>Villages</b>	<b>Estimated Population</b>	<b>Number of chosen persons</b>	<b>Percentage of chosen persons on estimated population</b>	<b>Percentage of chosen persons on Total estimated population</b>	<b>Sample technique</b>
Belemboke I	2500	40	1.6%	1.33%	Snowball sampling
Belemboke IV	500	15	3%	0.49%	Snowball sampling
Non-Indigenous authorized to serve in Belemboke I	7	4	57.14%	0.23%	Purposive sampling
Total estimation	3007	59		1.96%	

Source: Mission’s Health Centre database (2021).

### **3.5.3. Sample size**

Determining the appropriate sample size for qualitative research has always been a contentious and challenging task. Studies often provide techniques and arguments for selecting sample sizes that allow for some degree of interpretation. Mthuli et al., (2022) suggests that any number between 10 and 30 is suitable for qualitative research as long as the sample adequately represents the phenomenon under investigation. However, Hennink and Kaiser, (2022), in another study to determine sample size for qualitative research through an adaptive approach such as saturation, unveiled that studies using empirical data reached saturation within a narrow range of interviews (9–17) or focus group discussions (4–8), particularly those with relatively homogenous study populations and narrowly defined objectives ( p. 1).

In this study, a total of fifty-nine (59) participants were included, individuals from both villages, pastoral staff from the Church, and representative from the government. Snowball sampling was applied to stratify the participants according to their age and gender into focus group

discussions (Bairagi & Munot, 2019). Purposive sampling was used to select key informants and participant observation. Tables 2 and 3 present the participants in the study from the two locations.

**Table 2. All the participants demographic in Belemboke I**

<b>Population Description</b>	<b>Sampling Technique</b>	<b>Sample size</b>	<b>Purpose</b>
<b>Male Bk I of age 18-30</b>	Snowball sampling	<b>8</b>	Focus group discussion
	Purposive Sampling	1	Key informant
<b>Female Bk I of age 18-30</b>	Snowball sampling	<b>8</b>	Focus group discussion
	Purposive Sampling	1	Key informant
<b>Male Bk I of age 31-70</b>	Snowball sampling	<b>8</b>	Focus group discussion
	Purposive Sampling	1	Key informant
<b>Female Bk I of age 31-70</b>	Snowball sampling	<b>8</b>	Focus group discussion
	Purposive Sampling	1	Key informant
<b>Male Bk I of age (18-70)</b>	Purposive sampling	2	Participant observation
<b>Female Bk I of age (18-70)</b>	Purposive sampling	2	Participant observation
<b>Church's pastoral Agent</b>	Purposive sampling	1	Key informant
<b>Government's official</b>	Purposive sampling	1	Key informant
<b>Primary school head teacher</b>	Purposive sampling	1	Participant observation
<b>Nun in charge of Heath centre</b>	Purposive sampling	1	Participant observation
<b>Total in Belemboke I</b>		<b>44</b>	

**Table 3. All the participants demographic in Belemboke IV**

<b>Population Description</b>	<b>Sampling Technique</b>	<b>Sample size</b>	<b>Purpose</b>
<b>Male Bk IV of age (18-70)</b>	Snowball sampling	<b>6</b>	Focus group discussion
	Purposive Sampling	1	Key informant
	Purposive Sampling	1	Participant observation
<b>Female Bk IV of age (18-70)</b>	Snowball sampling	<b>6</b>	Focus group discussion
	Purposive Sampling	1	Participant observation
<b>Total in Belemboke IV</b>		<b>15</b>	

In summary shown in Table 3, the key informant interviews involved a total of 7 individuals, categorised as follows: 1 Catholic Church pastoral agents, 1 government official, a man and a woman from Belemboke I, and a man from Belemboke IV. Regarding the focus group discussions, the researcher engaged 12 people in Belemboke IV and 32 people in Belemboke I. Finally, a total of 2 people in Belemboke IV and 6 in Belemboke I were engaged in participant observation.

### **3.6. Research instruments**

The types of studies and researchers require different types of research instruments. Various researchers use a variety of tools to accomplish their objectives. Participant observation, focus groups, and key informant interviews were used as the main methods for collecting data for this study. It is important to highlight at this point that, in order to ensure clarity and fluency, questions were translated from English into three languages: French, Sango, and Mbenzele. The researcher also translated responses from each of the three languages indicated above to English once the information has been collected. The researcher further operationalised the diagnostic research approach which aimed at discovering relationships through the theories that have been retained for this study.

### **3.6.1. Observation guide**

Participant observation is a method in which the researcher is immersed within any community, culture or context which is different to the usual community and / or culture of the researcher (Barbour, 2018). Similar to traditional ethnography, participant observation is frequently supplemented with other qualitative methods like focus groups and interviews. This approach was also utilised to gather data regarding the food consumption score, coping strategies, and nutritional state of the chosen children via the record of the Health Centre. It plays a crucial role in the iterative research process, which entails ongoing assessment and enhancement. In this study, the researcher used the data obtained through this method to check against 4 men and 4 women participants' subjective reporting of what they believe and do with regards to the LTSs and FS among the Bayaka of Belemboke I and Belemboke IV, Nola in Central African Republic.

### **3.6.2. Focus group discussion guide**

Focus group discussion is when many people are asked to gather together in a group to talk about a specific topic. The researcher as a moderator or facilitator presented the subject and probes deeply into the issue of FS and land tenure among the Bayaka of Belemboke I and Belemboke IV. The researcher was able to control digressions and stop break-away conversations. The researcher guaranteed that each participant contributed while preventing any one person from dominating the conversation (Brennen, 2021; Dehalwar, 2024 ). In this study, there were 2 focus discussion groups of 8 men and 2 of 8 women in Belemboke I. In Belemboke IV there was one focus group with 6 men and another with 6 women. A total of 44 persons were engaged in the focus group discussions.

### **3.6.3. Key informant interview guide**

In an interview involving key informants, the researcher seeks out precise details that can be contrasted and compared to information from previous interviews (Roulston & Choi, 2018). It is one method of eliciting information about a group's mindsets and beliefs. The researcher gathered information from Key informants among Bayaka of both villages as well as from the church pastoral agents and government officials using this method. Key informant interviews are chosen as the method of choice because of their adaptability, they produced reliable and detailed information about how the availability, accessibility, utilisation, and stability of FS are affected by LTSs with a focus on how it can be used as a tool of social transformation among the Bayaka of Belemboke I and Belemboke IV. The seven key informants consisted of the priest in charge, the

chief of Sced village, two men and two women from Belemboke I, and one man from Belemboke IV.

### **3.7. Pilot study**

A pilot study is a small-scale methodological test run in advance of a larger investigation. It serves to make sure that the instruments used in the actual investigation are accurate and trustworthy (Anaam et al., 2020; Malmqvist et al., 2019). A month before obtaining the research permit from Tangaza, the researcher immersed himself in the two communities being studied and tested all data collection tools. The interview guide was tried with two focus groups of 5 women and 5 men chosen at random. and 3 key informants to evaluate the study's feasibility. Most of the questions were refined, and those who participated in the pilot test were not included in the main research. This helped to improve the study design prior to the actual study's execution and the increase in the chances of success of the study.

#### **3.7.1. Trustworthiness**

Lemon and Hayes (2020) established the trustworthiness criteria to assess qualitative research, a concept originally introduced by Ahmed (2024). The authors argued that applying the same criteria for evaluating both quantitative and qualitative research was illogical due to the differing epistemological foundations of the two approaches. In qualitative research, the trustworthiness criteria are defined in relation to the reliability of the findings and the ability of the researcher to convince their audience of the research's value (Nassaji, 2020). Lincoln and Guba identified four key trustworthiness principles in qualitative research: credibility, transferability, dependability, and confirmability. These principles serve as alternative concepts to the traditional notions of internal validity, external validity, reliability, and objectivity used in quantitative research. In this study, trustworthiness was established through two methods. First, the continuous triangulation of information gathered from participants indicates that the results are largely influenced by the respondents themselves rather than any biases, motivations, or interests of the researcher. Second, the findings align with other research conducted at both global and continental levels, demonstrating their applicability to various contexts and settings.

#### **3.7.2. Credibility**

Credibility, replacing internal validity, focuses on the truth value of the research findings and whether the researcher has demonstrated a sufficient level of confidence in the findings based

on the phenomenon being studied (Lemon and Hayes, 2020). In order to address credibility, the study plans to gather a sample of participants, as indicated in the participant demographic table, to provide their perspectives and experiences. In order to ensure that the results are accurate and that they can be applied to the intended population in a natural setting, the researcher discussed the specifics with a small group of participants to ensure that the findings closely matched their interpretations. To guarantee that the meaning of the participants is preserved, transcriptions and audio recordings were cross-checked. The data collection, processing, and interpretation processes were all clearly documented, and a clear copy of the field notes and transcripts was preserved. This helped to establish the trustworthiness and the credibility of the study. Finally, the researcher ensured reliability through the validation of interviewees and the use of triangulation of qualitative methods like participant observation, focus group analyses, and key informant semi-structured interviews. Additionally, the pilot study also helped to test data collection tools for research.

### **3.8. Data collection techniques**

Prior to the data collection, a research introductory letter was requested from Tangaza University. Permission was sought from the administrative authority of the municipality of Nola, as per their respective guidelines, before commencing any research activities. With the aim of achieving methodological triangulation and recognising its utility, the collection of information on LTSs and FS among the Bayaka of the two chosen villages involved participant observation, analysis of focus groups, and semi-structured interviews with key informants. Before conducting interviews or focus groups, the researcher clarified the objectives of the study and ensured confidentiality for all participants.

Since data collection is a fundamental tool of research (Mazhar et al., 2021; Oso, 2016), the primary data collection techniques for this study included: memoing and journaling, electronic and hard copy field notes, and audio recordings and a clear copy of the field notes and transcripts were preserved. The participant observation considered 4 men and 4 women aged between 18-70 from both settlements. These helped the researcher analyse work through the patterns in the data. To gather information on LTSs and FS, the researcher utilised field notes that encompass details regarding availability, approachability, utilisation, and steadiness. These field notes included the researcher's reflections before and after interviews, documenting the entire procedure.

In addition, an audio recorder employed to capture the discussions held during focus groups and the interviews conducted with key informants.

### **3.9. Data analysis**

According to Coffey (2018), in ethnographic studies, the strategies for collecting and analysing data can be preplanned as part of the study design. The researcher organised and managed the data by identifying the important statements from the collected data. These statements entered into the Qualitative Data Analysis (QDA) lite and then extracted, categorised, and interpreted (Holloway, 2020). The researcher utilised a deductive-inductive thematic analysis approach which is crucial in developing a social transformational framework for land tenure systems and food security. The deductive approach allowed the researcher particularly in the third objective to ground the framework in established knowledge. While inductive analysis of empirical data was necessary to refine and adapt the initial framework to the specific context. This had led to develop a comprehensive, context-specific framework to address objective (3) and drive meaningful social transformation in land tenure systems and food security. The following are the four major steps used.

First, based on the theories, in view of the thematic analysis, the researcher manually created a coding template that included a list of expressions or phrases to be collected. Second, examination of data. The researcher thoroughly examined the data to identify the phrases and sentences that matched the codes in the template. Third, using the Qualitative Data Analysis (QDA) software. The coded data were summarized into a specific number of themes, which were reported in the results section of the research (Jayawickrama et al., 2020). Fourth, use of discussion phase. The researcher assessed how the emerging themes aligned or differed from the three main SDGs are (SDG 15) Life on Land, (SDG 2) Zero Hunger, (SDG 16) Peace, Justice and Strong Institutions and ILO Convention 169 as well as the original theoretical framework (Selvam, 2019).

### **3.10. Ethical considerations**

Given the significant impact of ethical considerations on the overall integrity of research and the advancement of knowledge, the researcher obtained an ethical clearance certificate from Tangaza University. Additionally, authorisation was sought from the administrative authorities of the town of Nola in the Central African Republic, enabling access to communities and the selected research participants. The study's objective was clearly explained to the target participants, who

were given ample opportunity to seek clarification by asking questions. Every respondent underwent the necessary informed consent process, which were completed prior to each focus group discussion or interview. To ensure confidentiality and protect the participants' privacy, pseudonyms were used. Also, to safeguard participant confidentiality, consent was obtained from individuals shown in the photos, who were not actual study participants.

### **3.11. Chapter summary**

In this chapter, the methodology for the study was outlined, encompassing the key components of the research approach. The chapter addressed the research design, target population, sample size, sampling methods, data collection instruments, procedures for data collection, pilot study, strategy for data analysis, and ethical considerations. The next chapter will delve into the research findings presentations and analysis.

## **CHAPTER 4: RESULTS**

### **4.1. Introduction**

This section presents the results of the findings of this research. Its primary aim is to shed light into the intricate relationship between Land Tenure Systems (LTSs) and Food Security (FS) among the Bayaka of Belemboke I and IV in the Central African Republic. The chapter presents also the demographic details of each participant and subsequently, the data collected from the field. Through a carefully selected participant pool, and aligning closely with predefined research objectives, the chapter presents perspectives of the Bayaka on land ownership, the impact of external pressures, and the role of LTSs in shaping food security within the communities. It highlights the contrasting models between villages, with Belemboke I serving as a successful example due to a stable land tenure system.

### **4.2. Demographic presentation**

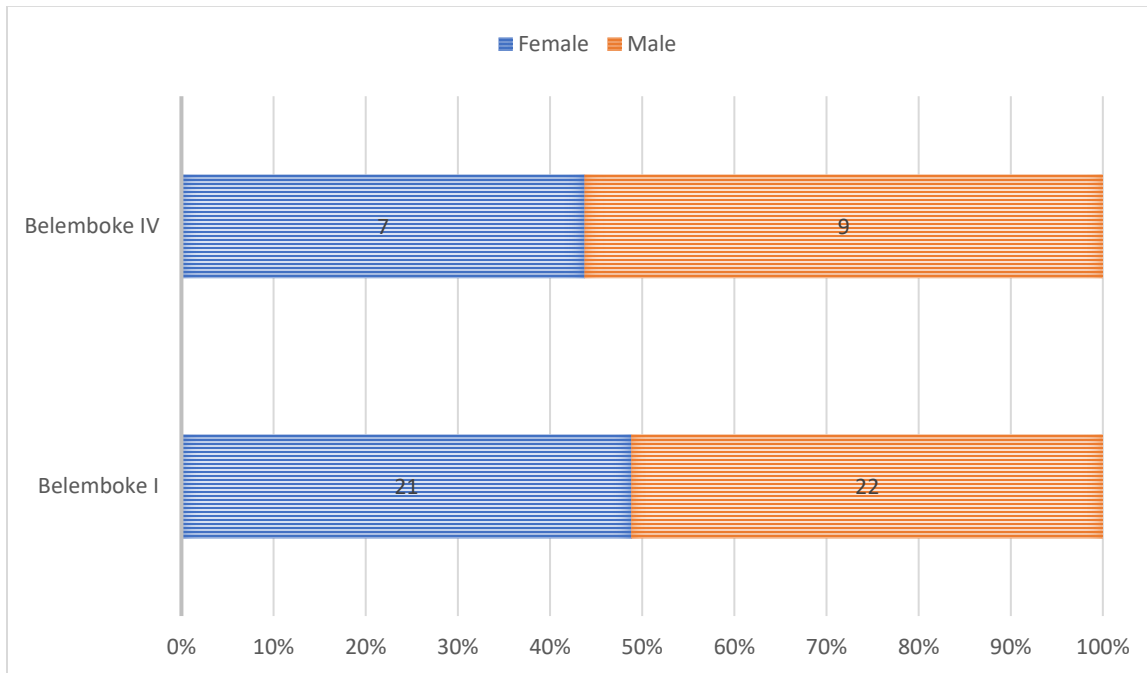
The researcher's approach to participant selection aimed to gather a diverse range of data on the research questions. By including youth and adults in their family size from two different villages, irrespective of gender, the study was able to obtain a wide range of information and insights.

A wide range of age groups participated in the study, guaranteeing a thorough understanding of the research topics. This wide range provided perspectives from various experiences and life phases. A gender-inclusive approach further enriched perspectives, considering both men and women. Marital status and family size were factors considered to understand household food consumption and coping strategies during nutritional challenges, vital for assessing community food security (Bondarenko et al., 2022). Participants were chosen based on direct experiences, ensuring practical insights. Characteristics were carefully selected to provide comprehensive data on household food security and the Bayaka community's views on land tenure. This diverse pool facilitated a multifaceted understanding of these significant issues. In order to facilitate the data referencing, the participants' serial number on the list, served as their reference code in the reporting of the findings.

Furthermore, on the demographic information, the Key Informants Interviews (KIIs) and Focus Group Discussions (FGDs) in Belemboke I and IV were conducted with diverse participants. The KIIs were coded sequentially from KII 1 to KII 7 and included individuals from

various age groups and ethnicities. The FGDs in Belemboke I were coded from FGD BK\_I 8 to 39 and consisted of four groups: three groups of men and women aged 18-31, and one group of men and women aged 31-70. The FGDs in Belemboke IV were coded from FGD BK\_IV 40 to 51 and included two groups of men and women, with varying age ranges and marital statuses. Additionally, participants were observed during the study and coded sequentially from P.O 52 to 59, all within the age bracket of 31-70. These participants included married and single Bayaka and 4 non-Bayaka individuals from both Belemboke I and IV.

#### 4.2.1. Respondents' gender

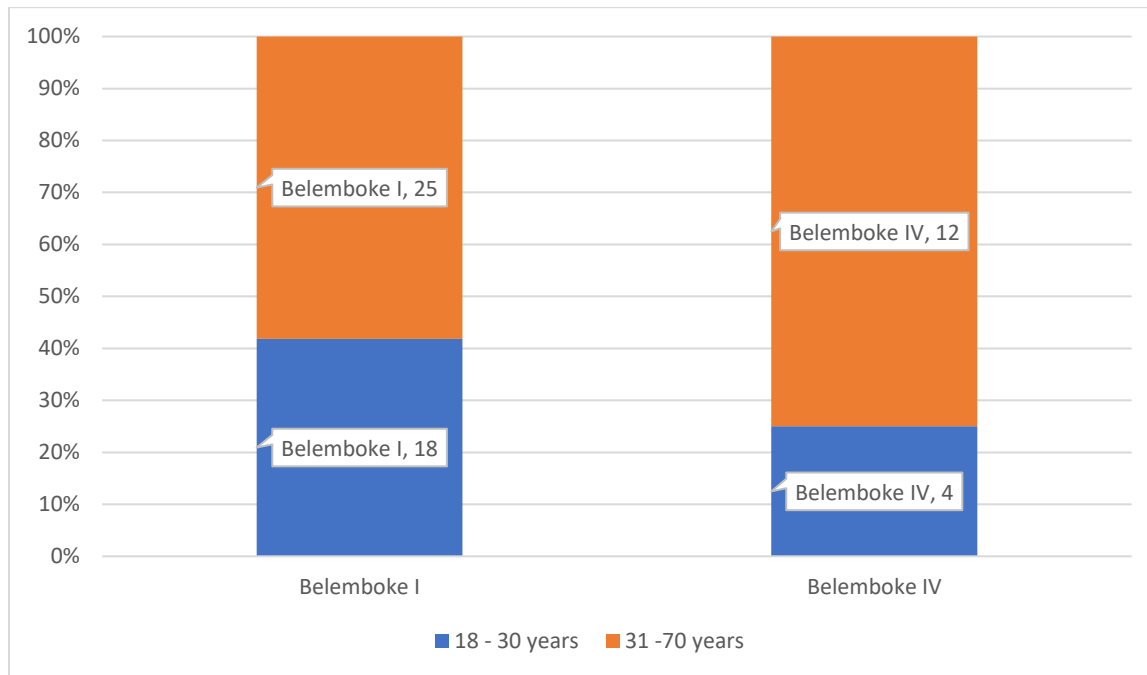


n = 59

**Figure 2. Respondents' gender**

Figure 2 shows the gender composition of the participants in the Belemboke I and Belemboke IV. It indicates that there was a slight balanced gender distribution of the participants, with 22 males (51.2%) and 21 females (48.8%). Conversely, Belemboke IV had a slight predominance of the male participants, with 9 males (56.3%) and 7 females (43.8%).

#### 4.2.2. Respondents' age bracket

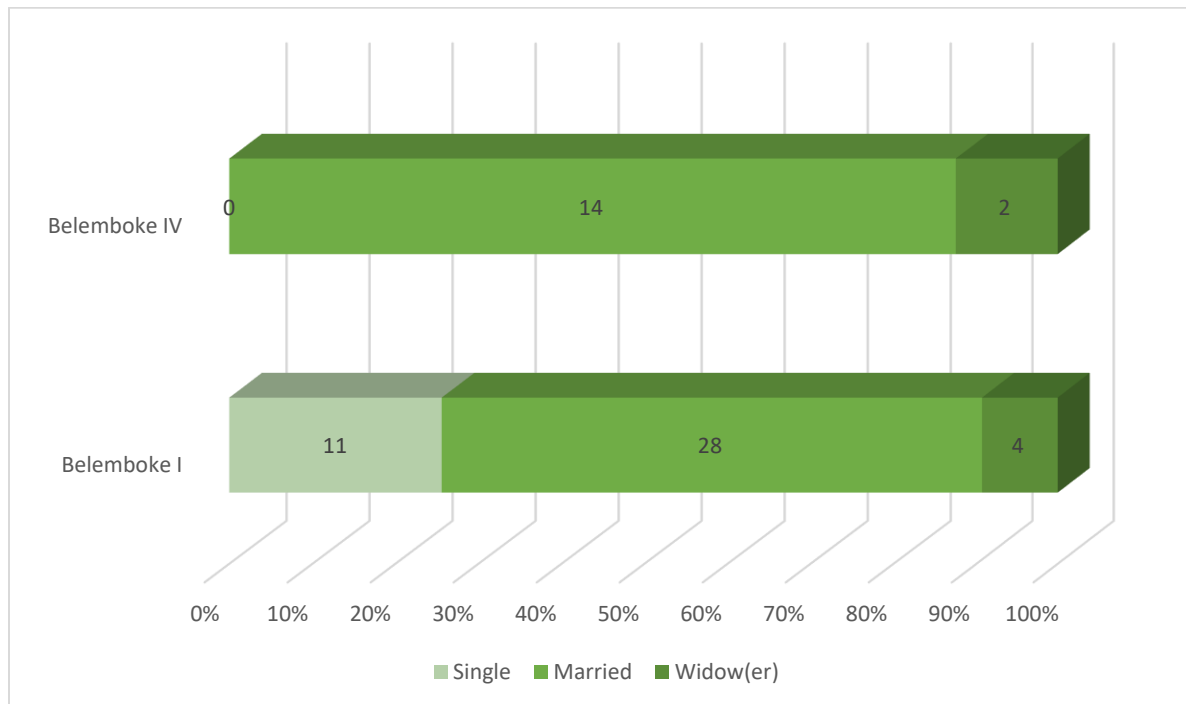


n = 59

**Figure 3. Respondents' age bracket**

Figure 3 shows the age bracket distribution of the participants in Beleboko I and Beleboko IV. There was a significant representation of older participants in both groups. In Beleboko I, out of 43 participants, 18 were aged 18-30 (41.9%) and 25 were aged 31-70 (58.1%). On the contrary, in Beleboko IV, out of 16 participants, 4 were aged 18-30 (25%) and 12 were aged 31-70 (75%).

### 4.2.3. Respondents' marital status

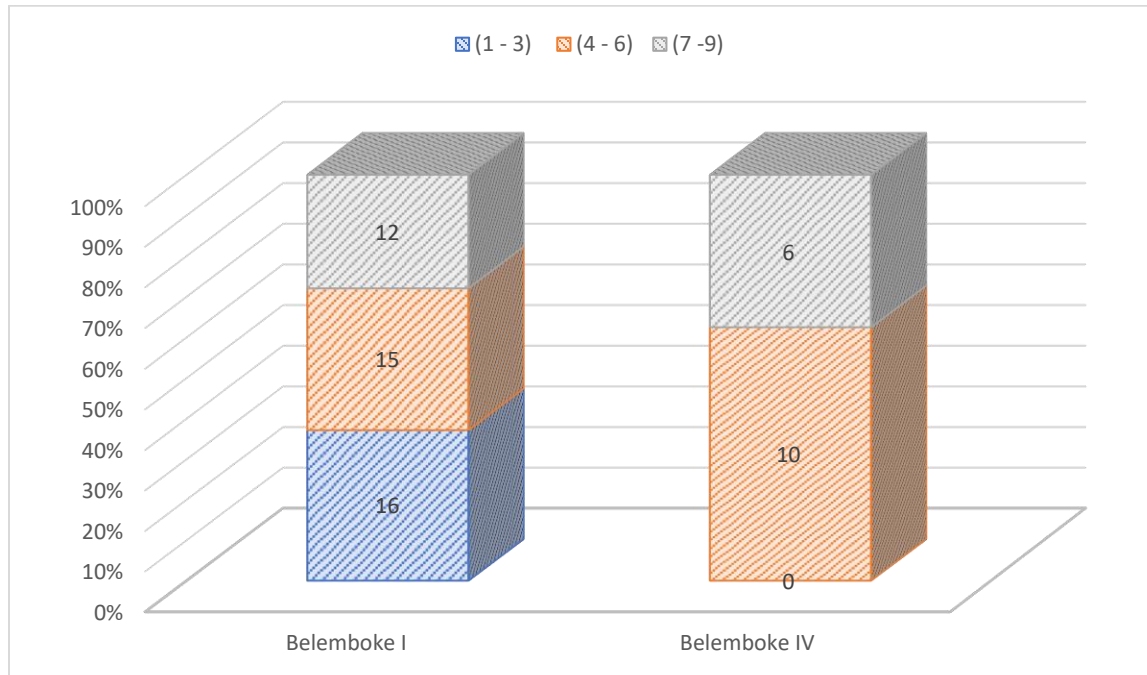


n = 59

**Figure 4. Respondents' marital status**

Figure 4 illustrates the marital status of participants in Belemboke I and Belemboke IV. It shows a significant predominance of married individuals in both groups. In Belemboke I, 28 out of 43 participants were married (65.1%), 11 were single (25.6%), and 4 were widowed (9.3%). In contrast, Belemboke IV had 14 out of 16 participants married (87.5%) and 2 widowed (12.5%).

#### 4.2.4. Respondents' family size



n = 59

#### Figure 5. Respondents' family size

Figure 5 shows the family size distribution of the participants in Belemboke I and Belemboke IV. It indicates varied family sizes ranging from (1 to 9) among the groups. In Belemboke I, among 43 participants, 37.2% had a family size of (1-3), 34.9% had a family size of (4-6), and 27.9% had a family size of (7-9). In Belemboke IV, among 16 participants, none had a family size of (1-3), 62.5% had a family size of (4-6), and 37.5% had a family size of (7-9).

#### 4.3. Presentation of findings and data analysis

Guided by the research questions, and aligning closely with predefined research objectives, the data collected from the fieldwork were carefully presented as received from the selected participants (Coffey, 2018). The following is the coding frequency of the triangulated responses from the three main sources that were used in this study shown in figure 4.

Coding frequency of the triangulated responses from the Key Informant interview, Focus Group Discussions (FGD) and Participant Observations (P.O).

**Table 4. Coding frequency of the triangulated responses**

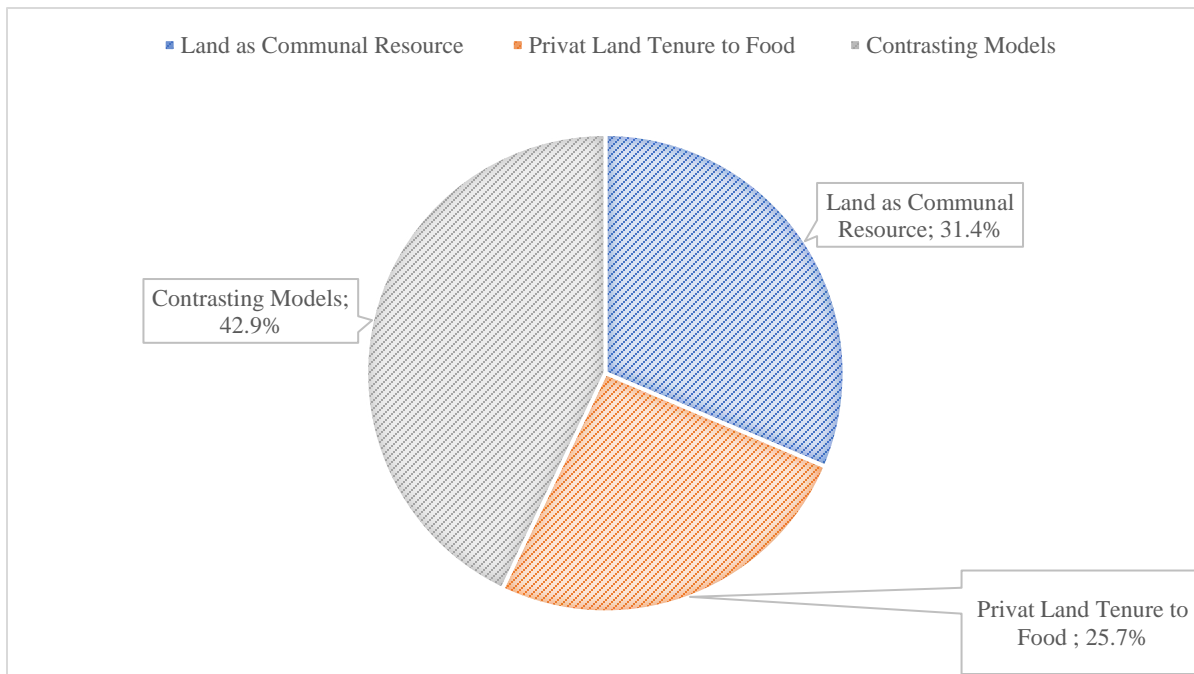
<b>Objectives</b>	<b>Themes</b>	<b>Count</b>	<b>% Themes</b>	<b>Number of participant / documents</b>
<b>Contribution of land tenure to food security</b>	Land as communal resource	11	6.0%	7
	Private land tenure to food security	9	4.9%	6
	Contrasting models	15	8.2%	6
<b>The impact of land tenure security on food security</b>	Impact of (LTS) on accessibility of food	47	25.5%	7
	Challenges to land security	17	9.2%	9
	Gender-specific challenges	9	4.9%	3
<b>Transformational framework</b>	Other challenges	14	7.6%	6
	Traditional practices and sustainability	23	12.5%	6
	Constructive external support	16	8.7%	6
	Government support	13	7.1%	6
	Faith based organization	10	5.4%	4

In this presentation, based on findings obtained from the QDA Miner Lite software, the primary objectives of the research are categorised into three distinct objectives, each focusing on different aspects of land tenure and its relation to food security. Under each objective, specific

themes are identified that represent various perspectives or findings related to that objective. The count indicates the number of times responses related to each theme. They were then coded reflecting the frequency of mentions by participants. The percentage of themes represents the proportion of total responses that each theme accounts for, providing insight into the relative importance or focus of each theme within the objective. Additionally, the number of participants or documents indicates how many contributed to the responses coded under each theme, highlighting the breadth of data supporting the findings.

#### 4.3.1. The contribution of the Land Tenure Systems (LTSs) to Food Security (FS)

This section presents the responses obtained from inquiries into the Bayaka's concept of land ownership delve into the intricate relationship between Bayaka communities, notably land tenure, deeply rooted in communal practices, shapes food security in Belemboke. This is shown in figure 6.



n = 59

**Figure 6. Land tenure systems to food security in Belemboke I and IV**

## **Theme 1. Land as communal resource**

The responses obtained from the question: “What can you say of the Bayaka’s concept of their right to land ownership?” The responses delved into the complex relationship between indigenous communities, particularly the Bayaka, and their concept of land ownership. Key insights emerge regarding indigenous perspectives on land tenure, the impact of external influences on their traditional practices, and the role of Land Tenure Systems (LTSs) in their lives. According to a male respondent KII 1, who was less than 30 years old and married with a family size of 4 and KII 5 another married male adult of almost 70 years old, with a family size of 7 people observed that, “the Bayaka are, historically, nomadic, have traditionally moved within the forest, gathering and hunting without the concept of fixed property (KII 1, KII 3)”. Another respondent explained:

At first, we do not have land as we have now in Belemboke I and Belemboke IV. We believe that *Komba* own the forest and no one has the right to appropriate it. We move in the forest we have no fixed place to stay. We move according to our needs in the forest hunting and gathering season after season, going after what is available. At some point in time, we just stay behind the house of some Bilo. The Bayaka work for them in exchange for some things that we do not have cassava and others. Sometime we move on to other places, other times some stay permanently with the Bilos. (KII 5)

However, external pressures, including the settlement of outsiders, have disrupted their traditional way of life, leading to the adoption of LTSs to secure a sense of place and identity (KII 3, KII 6) a married male adult with a family size of 6 and a single non Bayaka male adult respectively. In Belemboke communities, land tenure is deeply rooted in communal practices, fostering sustainable agricultural practices and ensuring equitable access to resources (KII 2). The contrast between Belemboke I and Belemboke IV highlights the impact of communal land tenure on food security and resilience (KII 2). Participants acknowledged the Bayaka's nomadic heritage as integral to their identity (FGD\_BK1, FGD BK IV), yet recognized the necessity of LTS in providing a fixed and referential place, symbolising their identity and ensuring stability (KII 6)

Respondents stressed that disagreements were minimal, but had consensus regarding the importance of LTSs in preserving indigenous rights and identity amidst external pressures (KII 3). However, according to (P 16) a married female respondent, slightly less than 40 years with a family

size of 5 people, and (P 51) a married adult female respondent in a family of 6; there may be differing perspectives on the extent to which settlement and the adoption of LTSs align with traditional values and practices (FGD\_BK1 P 16, FGD BK IV P 51).

The collected information elucidates the nuanced relationship between Bayaka communities and land tenure, highlighting the tension between traditional practices and external influences. It underscores the importance of understanding indigenous perspectives and the need for culturally sensitive approaches to land, which in the entire ecosystem is everything for the Bayaka.

## **Theme 2. Private land tenure contribution to food security**

The responses collected regarding the significance of Land Tenure Systems (LTSs) concerning food security among the Bayaka indigenous people in Belemboke villages, Central African Republic, illuminate the critical role these systems play in enhancing food security and overall community well-being. A female respondent in her fifties with a family size of 9 people (KII 4) along with others that are earlier described, LTSs stressed; secure land rights serve as a foundation empowering the Bayaka to engage in agricultural activities, manage resources sustainably, and safeguard their cultural heritage (KII 1, KII 2, KII 4). Also, (KII 7) who is a non Bayaka male respondent in his sixties with a family size of 8, alongside with (P 29) a married adult male with a family size of 8, consistently highlighted the positive influence of LTSs in ensuring food availability and redressing historical injustices endured from external forces (KII3, KII7, FGD\_BK1 P29). They argued:

The private LTSs really helps us to secure at least the main staple food. The fact that we have a village in which we are protected from the molestation of the Bilos, is a good thing. In the past, when a Moyaka woman came from gathering, the Bilos women would serve themselves and the left overs would be left for the Moyaka woman and her family! The same applies to Moyaka men. Now, with the private LTSs, we peacefully cultivate sufficient cassava which is the major staple food. In the past a small quantity as small as 2 kg can be exchanged for meat of 15 to 20 kg. The Private LTS has in a way helped to mitigate the overwhelming injustice (FGD\_ BK1 P 29).

A unanimous consensus emerged regarding the transformative impact of LTSs, facilitating the transition to settled lifestyles and elevating living standards (FGD\_BK I). Despite these

benefits, challenges persist, notably land encroachment and the insufficient legal recognition of land tenure rights, posing threats to food security (KII 4). Noteworthy observations include the shift from nomadic to settled living, evidenced by the establishment of permanent residences and adoption of agricultural practices (Lewis, 2015, p 2.). Three respondents: a married female and (2) married male adults were of the view that Belemboke stands out as a beacon of community cohesion, providing a sanctuary where Bayaka people find security and a profound sense of belonging (FGD\_BK1 P 16, P 26, P 27).

It is also vital to note that, participant 34, a nearly 70-year-old widow with a family of seven, agreed with participant 35, a married woman with a family of five, on the crucial importance of LTSs in securing land rights and promoting community well-being in Belemboke I compared to Belemboke IV (FGD\_BK1 P 34, P 35). However, differing views may arise regarding the pace of progress and ongoing challenges faced by various Belemboke villages.

The researcher believes that the gathered insights underscore the multifaceted significance of LTSs in advancing food security, preserving cultural heritage, and promoting community cohesion among the Bayaka people. Nonetheless, the findings also highlight the imperative for sustained efforts to address persistent challenges and safeguard indigenous land rights. Through continued collaboration and advocacy, stakeholders can work towards ensuring that LTSs remain a cornerstone of resilience and prosperity for the Bayaka communities in Belemboke and beyond.

### **Theme 3. Contrasting models**

The Responses collected from the inquiry on whether there is any difference in land tenure and availability of food between Belemboke I and Belemboke IV; highlights disparities in land tenure systems (LTSs) and food availability between Belemboke I and Belemboke IV villages, with Belemboke I demonstrating better control over land ownership and food production (KII 1, KII 2) both are married young male and female respondents. Belemboke I's LTSs is praised for contributing to community well-being, although challenges persist due to cultural impediments (KII 3) married adult male with a family size of 7. Participants expressed a desire for other Bayaka communities to replicate the success of Belemboke I (KII 4) a married adult female with a family size of 9 people. This theme is central to the choice of the two villages. As mentioned earlier, it is to effectively highlight their discrepancies and the pressing need to put Convention 169 into action in order to advance the relevant Sustainable Development Goals (SDGs).

**a). Beleboko I, Successful model:** in Beleboko I, residents acknowledged notable enhancements in their quality of life, including advancements in education, housing, and food security, all attributed to their LTSs. The private nature of land tenure in Beleboko I is perceived as advantageous, fostering respect and stability, a contrast to the vulnerability experienced by Bayaka in Beleboko IV (FGD\_BK1 P. 29) a married adult male with a family size of 8. He said:

In my opinion, there is likely a discernible difference in land tenure issues and food availability between Beleboko I, Beleboko IV. The village has become a big village we gave birth to children, schooled them, have our farms to be able to feed our families. We are grateful for the school, there is also the need to form them for the hunting and gathering. Unlike in the past, we have homes and eat better even though, getting a thin sardine is expensive, and getting meat is even more difficult. Having a roof over our heads in a village that is ours has greatly improved our situation. (KII 4, FGD\_BK1, P. 20, P 18).

The last two respondents; a young single female and a married young female respondent said; “although, there is still much to be done in Beleboko I, it still has advantages and privileges when compare to neighbouring Bayaka settlement.” Figure 7 shows the beauty of a settled life brought by the missionaries.



**Figure 7. A view of a portion of Beleboko I showing the Mission vehicle. (Source: the researcher, 2023)**

## **b). Belemboke IV, struggles with dependencies**

Conversely, in the view of a married young male with a family size of 3, in Belemboke IV, Bayaka encounter challenges such as inadequate compensation for services rendered and confrontations over perceived work deficiencies (FGD\_BK IV P 43). One resident earlier described explains; "Services provided to Bilos by Bayaka are often undervalued. Instances of Bayaka failing to adhere to work schedules are met with violent retributions. Such incidents are prevalent in Belemboke IV, severely impacting our means of sustenance." (FGD\_ BK1 P 29). Figure 8 shows children from the Belemboke IV settlement.



**Figure 8. A photo of some children at the entrance of Belemboke IV.** (Source: the researcher, 2023)

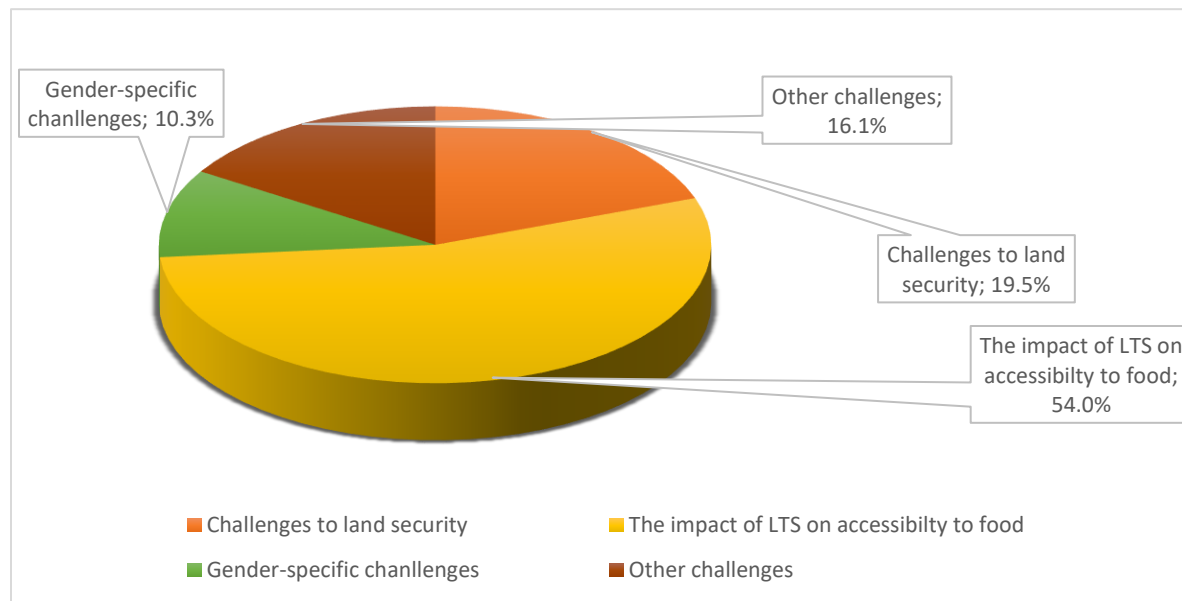
According to a married adult male with the family size of (7), tensions arise in Belemboke IV concerning debts accrued from poaching initiatives, underscoring friction with external entities like the nearby Bilo village called SCED (FGD\_BK1 P 24). These dialogues shed light on broader issues surrounding economic reliance and power dynamics within Bayaka communities, with a consensus on the importance of sustainable land management and community empowerment, albeit with differing viewpoints on the involvement of external actors.

The overarching conclusion drawn from the amassed data underscores the vital interconnection between land tenure, food security, and community welfare among the Bayaka residing in Belemboke I and Belemboke IV. The findings advocate for the dissemination of

replicable success models while addressing entrenched systemic hurdles and power differentials. Efforts towards fostering equitable land tenure systems and ensuring food security stand out as pivotal pathways towards enhancing the overall well-being of Bayaka communities.

#### 4.3.2. The impact of Land Tenure Security (LTS) on Food Security (FS)

This section presents the responses gathered from inquiries which shed light on the influence of (LTS) on (FS) as well as the challenges faced by the Bayaka of Belemboke I and IV.



n = 59

**Figure 9. Land tenure security to food security in Belemboke I and IV**

#### Theme 1. The impact of LTS on accessibility of food

The first theme was to gauge the impact of Land Tenure Security (LTS) on Food Security (FS). A series of inquiries were presented encompassing accessibility, quality, food consumption, safety, coping strategies during adversity, and the prevalence of malnutrition within communities.

Going by the Food Consumption Score (FCS) module recommended by the World Food Program (WFP), the study showcases remarkable diversity in the food profile of the two villages. It includes staples like cassava and rice, various protein sources such as beans, meat, and seasonal insects (termites and caterpillars, as well as fruits and vegetables. This variety suggests a

potentially balanced nutritional intake. However, some items like honey and dairy are scarce or difficult to obtain. Sugar is purchased only when needed. The diet's composition, with its reliance on seasonal and foraged foods, reflects a strong connection to the local environment and traditional food systems, despite the limited availability of certain nutritionally dense items.

- a) **Accessibility to food:** the researcher asked respondents how food was accessible to their village and their opinion on the quality and safety of food produced or collected in their village. The respondents in Belemboke I represented by a young married female with a family size of 4, believed that food was somewhat accessible in their village (KII 2). Another respondent, a male married adult with a family size of (7) people, underscored the fact that there is enough cassava produced in the village of Belemboke I. However, animal proteins are lacking severely. Their inability to hunt and the absence of suitable programs to give alternative animal proteins were the causes of the insufficient animal proteins (KII 3). Some blamed lack of infrastructure assistance and outside influences for their inability to eat a healthy meal. In order to face the problem of acquiring animal protein, Belemboke I has advanced in terms of animal reproduction in the village compared to Belemboke IV, whose members depend solely on hunting, have to go further into the forest in order to obtain some game meat. (KII 3, KII 5). Figure 10 shows the people at a meal as the researcher takes the picture.



**Figure 10. Four Bayaka parents in Belemboke I taking their lunch** (Source: the researcher, 2023)

In Belemboke IV, three married adults male and two married adult females with an average family size of (7) people, were of the view that there was a notable lack of protein despite an abundance of carbohydrate-rich foods (FGD\_BK IV P 42). Families strive to provide for their children but face challenges ensuring consistent meals (FGD\_BK IV P 51, P 52). Access to seeds for planting and hunting remains problematic (FGD\_BK1 P 16, P 18), with some facing dangers such as attacks by Bilos and snake bites. Despite variations in food availability and quality, some households reported sufficient food access through farming and hunting (FGD\_BK1 P 25, P 27). However, there were also instances of dependency on poaching and limited farming (FGD\_BK1 P 31), exacerbating food insecurity for certain households.

**b) Food Consumption Score (FCS):** the researcher highlighted varying perspectives on food consumption and its quality in the community. The researcher explored whether many in the community ate to their satisfaction on a daily basis and inquired about the quality and safety of food produced or collected in the village. Using the module recommended by the World Food Program (WFP), the participants were given the possibility to respond to the question of ‘how many days in the last 7 days did your household eat (certain food?)’ (Mendy et al., 2020). Data were collected on the food groups consumed by households in the community during the seven days prior to the focus group discussions and interviews with the key informants.

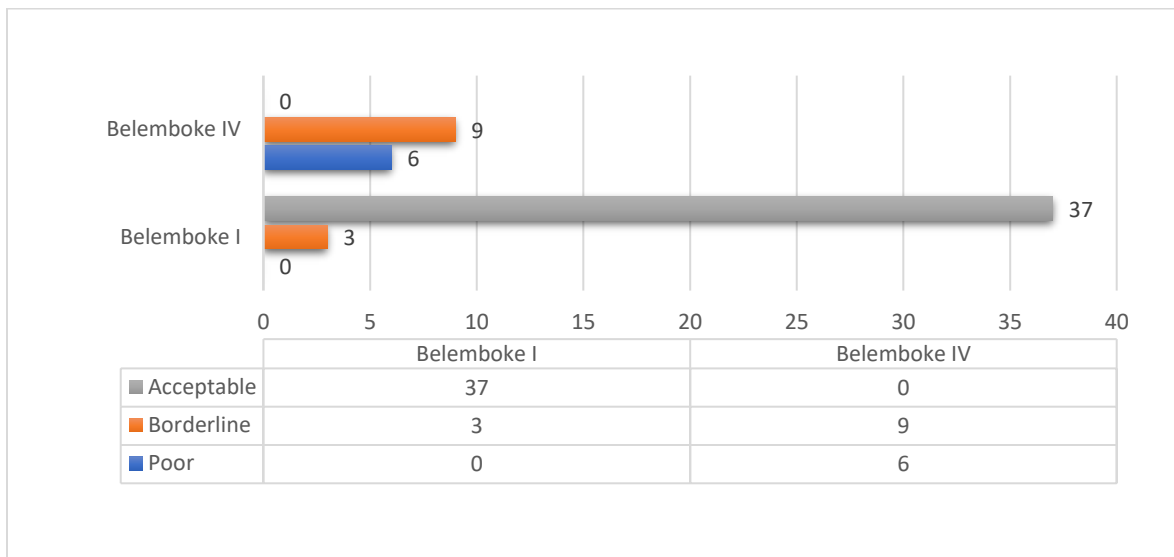
Data collection for household food consumption in both Belemboke I and Belemboke IV was carried out using a questionnaire that asks respondents to recall their food intake over the past seven days. The questionnaire focuses on the frequency of consumption for eight specific food groups, which were grouped and analysed to assess dietary patterns. These food groups include main staples (Cassava), pulses, vegetables, fruit, meat/fish/ seasonal proteins, milk, sugar/honey, and oil, each assigned a specific weight that reflects its dietary importance. For instance, main staples (Cassava) have a weight of 2, pulses 3, meat/fish 4, and sugar/honey and oil are both weighted at 0.5. Respondents’ answers about their weekly consumption help calculate the Food Consumption Score (FCS), a key indicator of household food security.

To calculate the FCS, food items were first grouped, and their consumption frequencies summed within each of the eight food groups. Then, the total frequency for each group was multiplied by its corresponding weight, and the weighted scores are summed to obtain the final FCS. Based on this score, households were classified into one of three categories: poor (FCS 0-

21), borderline (FCS 21.5-35), or acceptable (FCS greater than 35). This classification helps in identifying households at risk of food insecurity and provides a basis for further analysis or intervention.

On the one hand, the result of the Food Consumption Score (FCS) for 40 respondents from Belemboke I revealed significant insights into the dietary diversity and food security of the population. According to the FCS standards, which classify scores of  $28 < FCS \leq 42$  as "Borderline" and  $FCS > 42$  as "Acceptable," only three respondents were categorized as having a "Borderline" status with scores of 36, 38, and 39. The majority of respondents, totalling 37, fell into the "Acceptable" category with FCS ranging from 43 to 62. This distribution indicates a relatively high level of dietary diversity and food security within the community. The average FCS for Belemboke 1 was calculated to be 49.6.

On the other hand, the result of food consumption scores (FCS) among 15 respondents from Belemboke IV highlighted that the nutritional status ranged from 21 to 37, with an average score of 29.1. Specifically, six respondents fell into  $FCS \leq 28$  the "Poor" category with scores between 21 and 27, indicating severe dietary inadequacy. The remaining nine respondents were classified as  $28 < FCS \leq 42$  "Borderline" with scores ranging from 29 to 37, suggesting moderate dietary diversity but still at risk of nutritional deficiencies. Figure 11 is a presentation of food consumption score in the two villages.



**Figure 11. Food Consumption Score (FCS) Belemboke I and IV**

Participants noted variations in food quality, with certain products such as honey and quality caterpillars are disappearing due to negligence (KII 5) as reported by a married skilled adult hunter. In Belemboke IV, there was an imbalance between carbohydrate and protein intake, leading to occasional hunger (FGD\_BK IV P 42, P 51). While efforts were made to ensure children were fed, inconsistent access to food remains a challenge (FGD\_BK IV P 46 a single female respondent with a family size of 2). Our analysis indicated that while many individuals did not eat to their satisfaction daily, addressing factors like family size and land ownership could help improve food security and livelihood sustainability in Belemboke IV. The rare meat such as Gazelle, Impala, and Kudu gotten from hunting expeditions have to be roasted and preserved for a week as shown on figure 12.



**Figure 12. A woman in Belemboke I is drying the meat obtained from hunting to preserve it. (Source: the researcher, 2023)**

**c) Coping Strategies Index (CSI):** The researcher delved into the coping strategies of the Bayaka community during times of difficulty, focusing on food insufficiency and land issues. The question put to the respondents was: how do you cope in times of difficulties? The CSI was calculated by evaluating how households respond to food shortages using various coping strategies. First, a list of locally relevant coping strategies is developed (Eating less preferred foods\*3, Advance on salary\*2, Limiting portion sizes\*1, Skipping meals\*3, Illegal poaching\*3, Producing roofing material\*1.), and households are asked how often they used these strategies over a recent time

frame, usually the past seven days. The frequency of each strategy's use is recorded on a scale from 0 to 7 days, depending on how often it was employed during that period.

Each coping strategy was assigned a severity weight based on its perceived impact, with more harmful strategies receiving higher weights. To calculate the CSI, the frequency of each strategy is multiplied by its corresponding severity weight, resulting in a weighted score for each. These scores are then summed to generate the total CSI score for the household. The formula for the CSI is the sum of the products of frequency and severity weight for each coping strategy, providing an overall measure of the coping mechanisms of the household during food shortages.

Participants highlighted adaptive methods such as reliance on traditional ecological knowledge and community cooperation (KII 2), showcasing resilience in navigating resource constraints. However, there was a disparity in coping strategies among individuals, with some engaging in poaching or temporary work with the Bilo, while others opted for long-term forest stays (KII 3). This suggests both agreement and disagreement on the effectiveness and sustainability of various approaches to cope with challenges.

In terms of food procurement, hunting is becoming increasingly difficult, leading to a shift towards gathering and alternative sources of protein such as caterpillars and snails (FGD\_BK1 P 34). Participants via a single female (P 22) as well as key informants expressed willingness to explore new farming practices but face challenges in implementing NGO-provided ideas (FGD\_BK1 P 22). Regarding their coping mechanisms, some participants narrated:

In times of difficulties related to land issues and food insufficiency, we hold onto our traditional knowledge to navigate resource constraints and an emphasis on community cooperation to share available resources and mitigate the impact of scarcity on vulnerable members. Men go, for instance, to look for plant roofing materials that are sold in order to provide for their families. Some go for poaching along with the Bilo in order to provide for their families. Others go to do all kinds of temporal works with the Bilo. Other Pygmies go to the forest a bit far away from the village to live there for weeks or months. Some, are better off; while others, will have to come out to the village health centre for regular health issues. (KII2, KII3).

Furthermore, in the context of the study among the Bayaka, researchers identified several coping strategies that individuals and households employed to manage food insecurity. These strategies were assigned severity weights based on their perceived impact. Participants were asked if they had engaged in any of these coping strategies within the past 7 days. The results presented the sum of the severity scores for all coping strategies used by each respondent, representing a household. The coping strategies included eating less preferred foods (severity weight of 3), requesting an advance on salary (severity weight of 2), limiting portion sizes (severity weight of 1), skipping meals (severity weight of 3), engaging in illegal poaching (severity weight of 3), and producing roofing material (severity weight of 1). Interpretation of CSI Scores: Low CSI (e.g. 0-10): Indicates relatively food secure households, Moderate CSI (e.g. 11-19): Indicates moderately food insecure households and High CSI (e.g. 20+): Indicates severely food insecure households (Wallingford et al., 2024). Some specialised persons turn to weaving to augment their incomes as shown in figure 13.

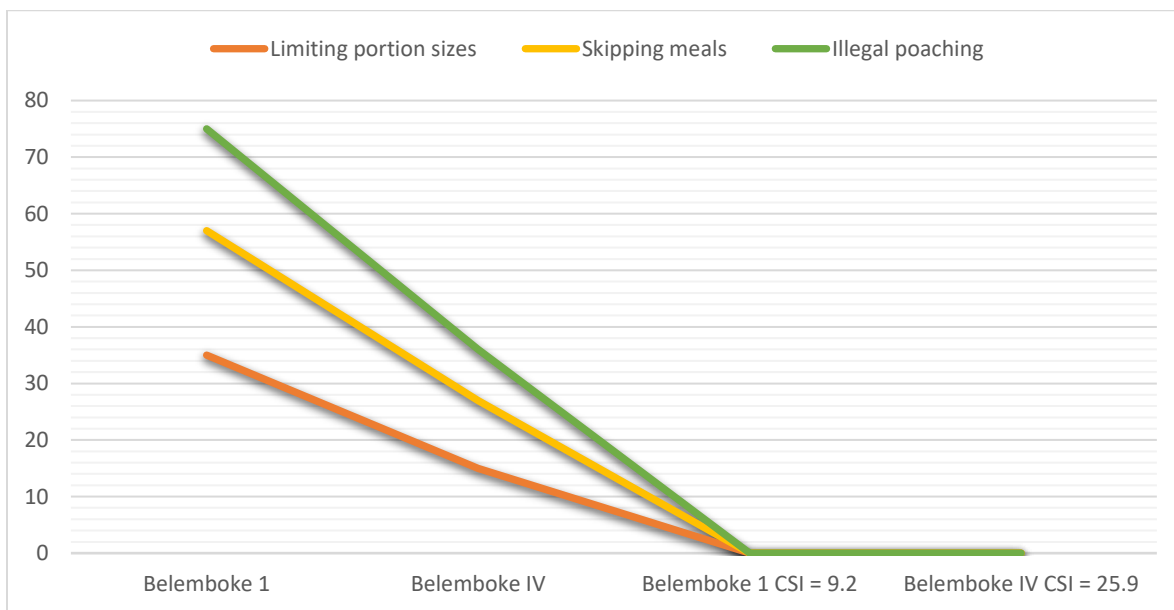


**Figure 13. A Bayaka craftsman waving a basket for getting honey in Belemboke I.**  
(Source: the researcher, 2023)

The result of the most coping strategies employed by 40 respondents in the Belemboke 1 community were as follows: Limiting portion sizes (used by 35 respondents), skipping meals (used by 22 respondents), and illegal poaching (used by 18 respondents). The least commonly used coping strategies were: producing roofing material (used by 8 respondents), and advance on salary

(used by 19 respondents). The average CSI per respondent is 9.2, indicating a relatively food secure households.

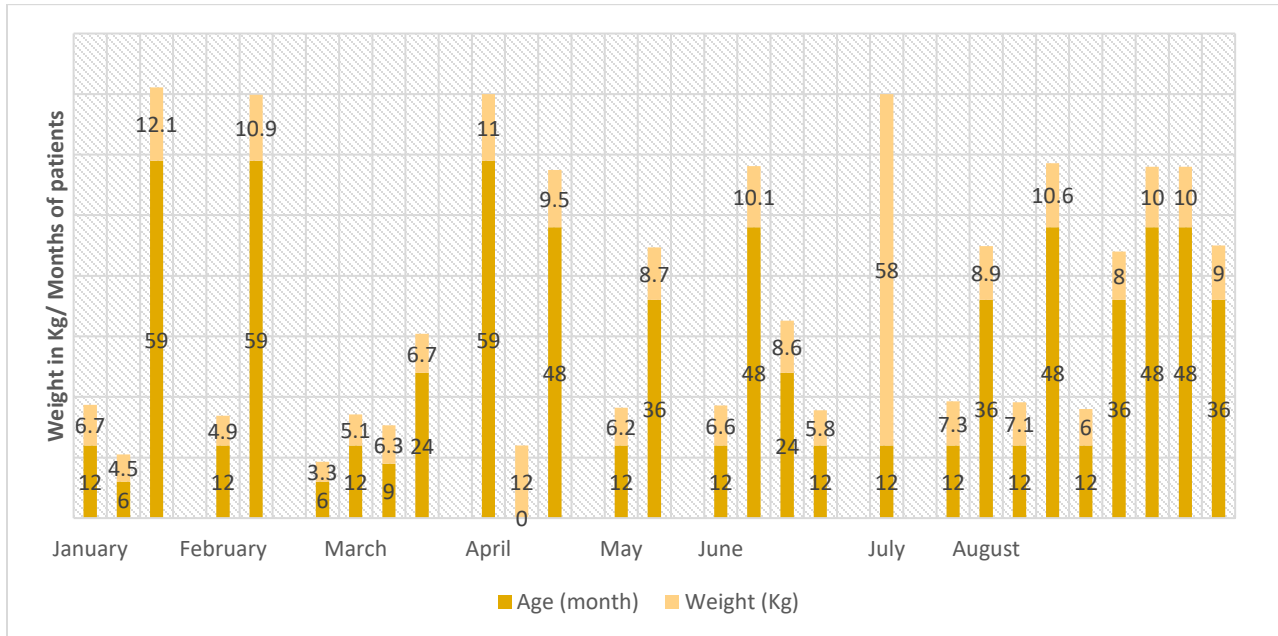
In Belemboke IV, the results of the most used coping strategies employed by 15 respondents to manage food insecurity were as follows: eating less preferred foods (used by all respondents), skipping meals (used by 12 respondents), and illegal poaching (used by 9 respondents). The least commonly used coping strategies were: producing roofing material (used by 4 respondents), advance on salary (used by 11 respondents). The average CSI per respondent is 25.93, indicating a severe level of food insecurity. Figure 14 gives the findings.



**Figure 14. Coping Strategies Index (CSI) Belemboke I and IV**

**d) Malnutrition indices:** The researcher gathered responses on malnutrition and food quality in the community, presenting diverse viewpoints. This was in response to the question: how will you describe the indices on malnutrition among the people? Young female and male respondents with a relatively small size of family of (4) each, generally agreed on low malnutrition rates compared to neighbouring areas (KII 2, KII 3). However, a Bayaka woman with a family size of (9) highlighted the levels, emphasising the need for a holistic approach to address gaps in nutrition education and healthcare (KII 4). This suggests both agreements and disagreements regarding the severity of malnutrition.

In order to analyse the question on malnutrition indices among children, in Belemboke, we present the data for severe malnutrition in figure 15 and moderate malnutrition in figure 17. The figures provide information on new cases of malnutrition in different months, including the age, and weight. Figure 15 addressed the question “How will you describe the indices on malnutrition among the children of Belemboke?” The data was provided from the health centre of Belemboke I.

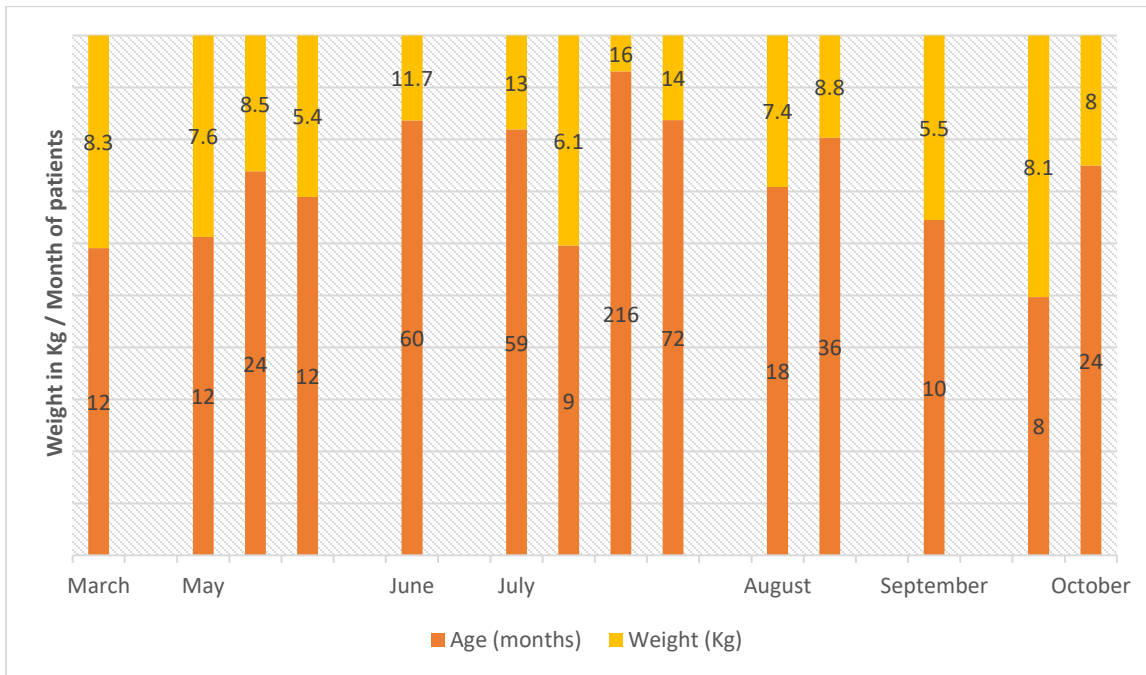


**Figure 15. Registry UNT- UNTA severe malnutrition, Belemboke, 2023**

Figure 15 indicates that the age distribution shows that children aged 0-5 years are the most affected, with ages ranging from 5.2 to 12.1 months, and there is a case of malnutrition in a 59-month-old child. Both genders are affected, with no clear dominance. The number of cases varies from month to month, indicating fluctuations in malnutrition cases, and May and June show increased cases, with multiple new cases reported. The weights of malnourished individuals range from 3.3 to 12.1 Kg, with May and April having higher-weight cases. The old cases from August show that malnutrition is not limited to new admissions. Figure 16 shows a child that is coming out of severe malnutrition.



**Figure 16. Two women with their children returning from gathering paused for a photograph in Beleboko I. (Source: the researcher, 2023).**



**Figure 17. Registry UNS, moderate malnutrition, Beleboko, 2023**

Figure 17 from the Catholic Mission’s health centre database (2023), indicated that: the age distribution shows that children aged 0-5 years old are affected, with ages ranging from

5.4 to 16 months. There was also a case of malnutrition in a (18 years) 216-month-old individual, which was not an error. It rather portrays the malnutrition reality of the settlement. Both genders, male and female, are affected. Cases of malnutrition are reported in March, May, June, July, August, September, and October. The weights of the malnourished individuals range from 5.4 to 16 Kg.

**d) General observations of the two registries:** One may affirm that malnutrition is prevalent in both severe and moderate forms across different age groups, with children under 5 years old consistently affected. Cases also extend to older age groups, and both genders being affected, indicating no significant gender-based difference in malnutrition rates. Monthly fluctuations suggest that malnutrition rates may be influenced by seasonal or temporal factors, while weight variations indicate the severity of malnutrition cases. Some fall into the severe range, while an anomaly in the age of 216 months (18 years old) in the figure 17 was not an error, but an exceptional case that required extra assistance, with similar cases not directly taken care of by the health centre.

## **Theme 2. Challenges to land security**

The responses collected discussed the challenges faced by indigenous communities, particularly the Bayaka people of Belemboke I and Belemboke IV, in securing land and food. It is important to recall at this juncture that the reason behind the choice of the two villages lies in highlighting the broader views of the challenges faced by the Bayaka and how best to address them. The young and the adult key informants were of the view that external pressures, such as encroachment by logging and mining industries, threatened their traditional territories, disrupting access to ancestral lands and undermining sustainable land management practices (KII 2, KII 3, KII 4). Legal recognition and protection for indigenous land rights are lacking, exacerbating their vulnerability and making land and food security complex (KII 2, KII 3).

**a) Encroachment and external restrictions:** In addition to limitations imposed by external entities such as government regulations, international agreements, or development projects, the researcher underscored the unauthorised occupation or use of land attributed to the Bayaka by the Bilos and other minority communities. Two male adults, who are respectively at the head of their families of (7) and (6), asserted:

The Bilos engage in deceitful land transactions with some Bayaka, circumventing authority approval. Often, sold land along the borders of the Bayaka territories are unknown to neighbouring owners until Bilos reveal themselves. When confronted, Bayaka discover that their land was sold without consent. As time passes, Bilos accuse Bayaka of theft, exacerbating tensions (KII 5, FGD\_BK IV 45).

These conflicts highlight major challenges: Bilos encroaching on Bayaka lands, accusing them of theft after illicit land acquisitions.

One notable challenge is the manipulation by non-indigenous individuals who exploit the Bayaka, tricking them into selling land at low prices (KII 1, KII 5). Additionally, some Bayaka themselves sell land to outsiders, often due to ignorance or debt-related issues. This internal issue compounds the external threats to land security.

The respondents in participant observation, two male adults at the head of families of (6) and (9) respectfully also highlighted their grievances with regards the encroachment of cattle herds on their land and its detrimental impact on their livelihoods. That was supported by a married female adult with a family size of 7. (P.O 56, 57,58). Participants express frustration over the destruction of their farms by the cattle, resulting in significant financial losses and trampling of their rights (P.O 56). There was a consensus among the community members on the need to address this issue, as it poses a threat to their well-being and undermines their established rights to the land (FGD\_BK I P 27). One respondent observed:

Something must be done to call the herdsmen of the cattle herds to order. Our village was created and we settled in it more than thirty years before the arrival of the cattle herds in our area. Yet, for years, they have been making life extremely difficult for us when they allow their cattle to destroy our farms in the night. In most cases, the Bayaka's rights are trampled upon when they are asked to pay an equivalent of 10 USD for a farm worth of 400 USD that was destroyed in the previous night by cattle (P.O 56,57, 58).

Consensus among participants includes the acknowledgment of disorderliness and a lack of respect for land limits within the community, particularly among the younger generation represented by single male respondent below the age of 25 years (FGD\_BK1 P 8). He said, “there is concern about the encroachment by Bilos, non-indigenous individuals, onto Bayaka land,

leading to disputes and tensions. Other two married male adults with a family size of (7) and (4) respectively and another single adult confirmed:

While the land allocated to the Bayaka has its merits, it is not entirely sufficient for their food security. The fertile but relatively small land requires Bayaka to venture further for supplementary proteins, as the savannah environment contributes minimally to their nutrition. Climatic conditions and limited access to the forest for hunting and gathering add to their difficulties (KII 5, FGD\_BK IV 44, KII 6).

Overall, the participants illustrated the multifaceted nature of the challenges faced by indigenous communities in securing land. While external pressures such as encroachment by industries pose significant threats, internal issues like manipulation and disorganisation within the community also contribute to the complexity of the situation. Consensus exists on the need for collective action and the importance of legal recognition and protection of indigenous land rights to address these challenges effectively.

### **Theme 3. Gender-specific challenges**

The respondents were asked “how does the land tenure system practiced in Belemboke I and IV contribute to the wellbeing of the community members? They persistently underscored the fact that, there were challenges linked to their gender, land and the nourishment of their household. For instance, while malnutrition indices in Belemboke 1 were relatively lower compared to neighbouring villages, gaps persisted in nutrition education and healthcare access, according to a male and female adult respondent (KII 3, KII 4). In response to these challenges, Bayaka women employed various coping mechanisms such as communal cooperation, traditional agricultural practices, and income-generating activities, reflecting their resilience and resourcefulness. However, part of the problem that emanated from the non-respect of land limits was described by a participant who is a married young female with a family of three in Belemboke 1: She said:

We have problem sometimes in hunting and gathering. Men are killed by Bilos in the forest over little matters. That was the case of my sister’s husband. Some other times, men are arrested by the authorities of the neighbouring countries where they are imprisoned for long. Others are victims of snake bites, leaving orphans and widows behind; making life extremely difficult (FGD\_BK1 P. 18).

In the light of the above citation, it become evident that enabling Bayaka women through secure land rights and inclusive decision-making processes is seen as essential for sustainable livelihood and community well-being. The description of gender complementary role is seen in the following assertion by a widow with a family size of 6 people.

In the past when we went to the forest, we settled well and started with some nice fruits. Our son climbs the tree to send down the fruits. As we encamped in our place of choice in the forest, it is time to form our children on various means of survival. My husband takes care of the boys as they go hunting with the dog, while I go gathering and showing my daughter certain things. There are times when my husband discovers honey on a tree. He climbs it while I remain beneath it to send a recipient containing a smoking wood that will facilitate harvesting the honey. The man also fabricates beds for her and her children in their huts. (FGD\_BK1 P 37).

Gender complementarity cuts across the daily struggle in the livelihood of the Bayaka. From the above assertion, it could be seen how the linkage of land and food security affect livelihood in different households among the Bayaka of Belemboke. Women often meet to discuss their challenges as shown in figure 19.



**Figure 18. A group of Bayaka women at the end of a meeting in Belemboke I.**

(Source: the researcher, 2023)

Despite consensus on the importance of securing land rights and promoting sustainable practices, there are divergent views on the impact of societal factors like alcoholism (commonly

produced and transported by women) on community development. However, there is agreement on the necessity of sensitization campaigns to reinforce respect for land limits and emphasize community responsibility for food security amidst changing societal and climatic factors.

#### **Theme 4. Other challenges**

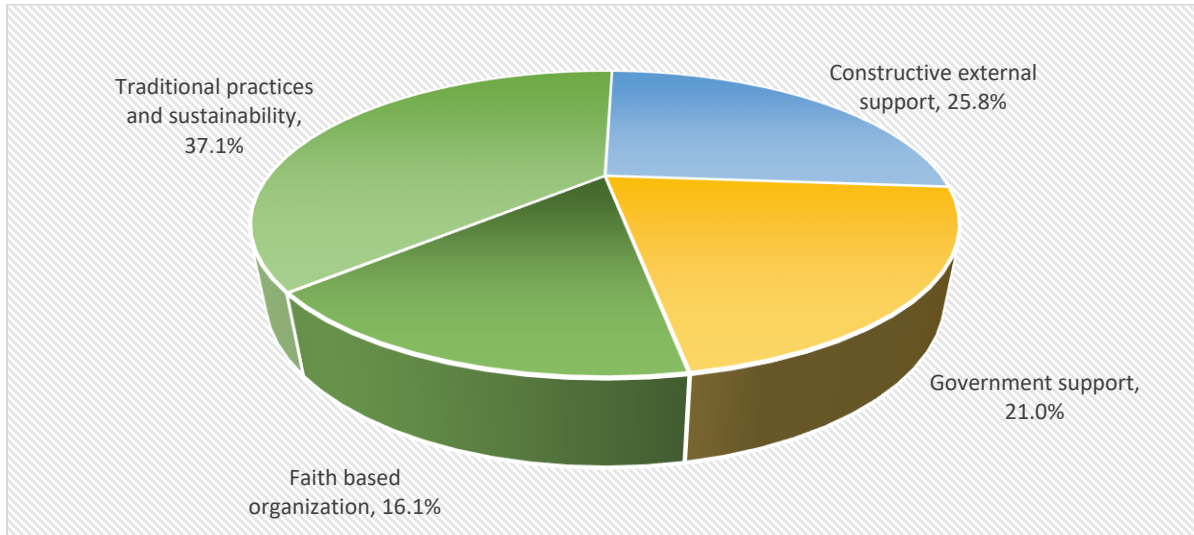
The responses collected delved into the challenges faced by the Bayaka community in terms of food accessibility, hunting, and livelihoods, revealing a complex interplay of internal and external factors (Permunta, 2019). There was a consensus among participants regarding the detrimental effects of laziness and involvement in poaching activities on food security (KII 5). A married young female respondent in a family size of (3) were of the view that while some Bayaka struggle to secure food, (FGD\_BK1 P. 21), alcoholism and the abuse of any other substances were some of the major challenges that cut across the entire community and beyond.

Disagreements arise regarding the effectiveness of collaboration with non-Bayaka individuals for poaching, with some highlighting its negative impact on the ability of the community to feed their families (KII 6 the experienced single male respondent). Additionally, there is a rift among the youth, with some embracing laziness and avoiding farm work, while others express a desire for independence and adherence to village rules. Two male adult respondents with reasonable size of families asserted that others migrate to the neighbouring towns across the borders (FGD\_ BK1 P 29, P 26). After the presentation of the exhaustive challenges, faced by the Bayaka, we turn to the presentation of the possible social transformational framework from their perspective.

The respondents (KII 2, FGD\_ BK1 P29, FGD\_ BKIV, P.O 57) outlined a range of significant challenges faced by the Bayaka communities of Belemboke I and IV. These included widespread alcoholism, theft of farm products by community members. There was also refusal by some to follow important community rules such as building appropriate shelters, maintaining reasonable farmland sizes, and avoiding alcohol consumption within the village. Additionally, the communities faced systematic discrimination and stigma, which further compounded these issues. The respondents indicated that this combination of challenges posed a serious impediment to the evolution and development of these Bayaka communities.

### 4.3.3. Social Transformational Framework

This part presents the result of the third objective. The responses provided valuable insights of the participants into the social transformation and development. These themes highlight the multifaceted nature of the challenges faced by the Bayaka and the need for a comprehensive, inclusive approach to address land tenure and food security issues in their communities. Figure 20 presents the vision of transformational perspectives envisaged by the Bayaka.



n = 59

**Figure 19 Transformational perspective from the Bayaka of Belemboke I and IV**

#### **Theme 1. Traditional practices and sustainability**

Several key points emerged from the responses gathered from the inquiry regarding possible social transformation on land tenure systems and food security among the Bayaka of Belemboke I and Belemboke IV.

**a) Community-driven initiatives:** KII 2, a young male respondent and a widow close to her 50 years was of the view that community-driven initiatives such as incorporating the traditional practices and indigenous knowledge of the Bayaka people could aid future progress. While modernity can complement certain aspects of Bayaka life, others should also be open to learning from the Bayaka way of living. Integrating traditional and modern approaches, which may lead to

more holistic and sustainable development for the Bayaka communities (FGD\_BK IV P 44, FGD\_BK I P 37). One person observed:

Yes, we want some things like schools, hospitals and our markets, but not with the destruction of our motherland and all that is in the forest. The destruction of the forest is an additional way of killing us. *Komba*, the great spirit of the forest is on our side, we shall continue to hope for the survival of the forest. We feel culturally suffocated with the pressure from every angle, logging companies on one side, restriction to some area in themes of hunting, (...). The respect of our way of life is always watered down by the Bilos. Beautiful cultural practices like the *Ekila* principle, dances like *Djoboko*, *Yeli* and many other things are going away some of our children may never know them if we do not do something to revive our simple way of living (FGD\_BK IV P. 41, P.O 52).

Responses gathered from both villages also emphasised the need for improved relationships between the Bayaka and the Bilos, highlighting the importance of mutual respect and recognition of Bayaka humanity. They argued that establishing respectful interactions could lead to access to essential services such as healthcare, education, and agriculture, ultimately enhancing food security.

However, FGD\_BK IV P 45, and P.54 two married male adults and few others at least five (5) out of the 59 participants raised doubts regarding the possibility of attaining complete self-sufficiency without outside assistance, especially from missionaries. They highlighted the persistent social and cultural conflicts with the Bilos, which might impede the formation of independent Bayaka communities and make them vulnerable to exploitation and dependence. They proposed a step-by-step empowerment approach, which involves establishing crucial services, legal advocacy, and then progressing towards customary land ownership rights.

The researcher argues that the responses obtained from the participants into social change among the Bayaka of Belemboke I and Belemboke IV highlighted the potential for sustainable development by combining traditional customs with modern methods, aiming to safeguard the forest and cultural traditions amid challenges like cultural oppression and tensions with the exogenous forces.

## Theme 2. Constructive external support

Respondents were asked to explain the possible opportunities in securing land and food in Bayaka communities. The responses revealed the necessity of constructive external support. This is a key point regarding the social transformational framework for land tenure systems (LTSs) and food security among the Bayaka of Belemboke I and Belemboke IV. Several suggestions were made.

**a) Education and advocacy:** participants, notably a young KII 1 and KII 5, an adult male respondents, stressed the importance of educating the population about land and food security issues and advocating for laws recognising indigenous land rights (Sama, 2022). They also highlighted the need to build on the experiences of communities like Belemboke I and engage with governmental and international conservation organisations to secure ecosystems and cultural values (Inoue, 2023). They also need to engage the Church in their attempts to solve their challenges via literacy that facilitate advocacy. Figure 21 shows active Church members preparing to share God's Word.



**Figure 20. A lady and three men preparing for the Sunday readings in Belemboke I.**  
(Source: the researcher, 2019)

**b) Responsible resource use:** A young male respondent, KII 1 emphasised the necessity of educating Bayaka communities about responsible hunting and gathering practices to ensure sustainability and discourage poaching activities (Breuer et al., 2019). This aligns with the idea of promoting traditional ecological knowledge and sustainable agricultural practices,

as mentioned by a young female key informant KII 2 and FGD\_BK1 participants. People can rely on nature for their food and balanced nutrition. Figure 22 illustrates this possible symbiotic relationship.



**Figure 21. Michel measuring the caterpillars from the Belemboke I's cooperative.**

*(Source: the researcher, 2020)*

**c) Enabling of Bayaka women:** KII 2 and KII 4, both of them women respondents, underscored the importance of recognising the insights and contributions of Bayaka women in crafting policies (Naresh, 2018), for land tenure and food security. Empowering women through inclusive decision-making processes and education can lead to more resilient and sustainable approaches. Figure 23 shows women at work.



**Figure 22. A woman and man sewing clothes at the sewing room in Belemboke.**

*(Source: the Researcher, 2020)*

Participants highlighted the complexity of addressing land tenure and food security issues among the Bayaka, emphasising the importance of education, advocacy, responsible resource use, empowerment of women, and collaborative efforts with external stakeholders. While there were some disagreements regarding the need for intermediary support, there was consensus on the necessity of inclusive, holistic approaches to ensure the well-being of the Bayaka communities.

### **Theme 3. Government support**

The researcher inquired from the participants concerning the complexities of establishing a social transformational framework for (LTSs) and food security among the Bayaka of Belemboke I and Belemboke IV. The key points of the outcome are presented next.

- a) **The importance of government support:** there was a call for government intervention, as outlined by a male adult respondent, (KII 5) and a female adult respondent (FGD\_BK1 P 32). They both called for passage of laws protecting indigenous territories, promoting food production, and addressing challenges like alcoholism (Kenfack, 2018). Also, challenges such as non-compliance with village rules and threats to cultural practices are acknowledged by two young and an adult male respondent as key (FGD\_BK1 P 13, 16, 28). Figure 24 illustrates the Central African government's commitment to including the Bayaka in decision-making processes.



**Figure 23. Exchange of greetings after the installation of two new chiefs in Belemboke I.** (source: the Catholic Mission archives, 2017)

Participants also stressed the importance of partnerships between governments, NGOs, and indigenous organisations in developing holistic strategies for land and food security. The backing (Guadalupi, 2018) of the Central African Government since 1973 has been remarkable. The donation of an ambulance and other health equipment for Belemboke in 2022 is an encouraging sign to support the improvement of the livelihood of the Bayaka. KII 3 a young male respondent highlighted the significance of maintaining the vision set forth in the establishment of Belemboke I as a model for sustainable development, emphasising the need for continued support from the government and faith-based organisations. Figure 25 depicts a capable group of healthcare personnel from Belemboke.



**Figure 24. The staff of the health centre of Belemboke I, Nola, Central Africa Republic.** (Source: the researcher, 2023)

**b) Replication of successful models:** more than two third of the participants were of the view of key informants 1 and 2 who were a male and a female respondent below the age of 30 years. KII 1 and KII 2. They advocated for replicating successful models like Belemboke I in other Bayaka communities. These models serve as blueprints for holistic development, integrating sustainable land practices, community resilience, and cultural preservation. Figure 26 depicts the valued freedom of the Bayaka family to own their farms without facing any harassment from a master.



**Figure 25. Members of a household at their return from farm in Belemboke I.**

(Source: the researcher, 2020)

While there is general consensus on the importance of land rights recognition, sustainable practices, and collaborative efforts, there's divergence regarding the necessity of intermediary support and the extent of government intervention. The dialogue underscores the multifaceted nature of the issues faced by the Bayaka and the need for a comprehensive, inclusive approach to address them.

#### **Theme 4. Faith based organisations**

Some proposals for establishing a social transformational framework for land tenure systems (LTSs) and food security among the Bayaka were underscored as follows:

**a) Role of intermediary agents:** there was consensus among participants, across the board that intermediaries were needed. For instance, a widow (FGD\_BK1 P 37) and a male married adult with a family size of six (6) persons (FGD\_ BK1 P28), were in support of the crucial role of intermediary agents. Especially, in negotiating fair agreements and building trust between Bayaka communities and external entities. These agents serve as liaisons, ensuring settlements respect the autonomy and well-being of the Bayaka. Religious communities were identified as possible partners. Figure 26 shows the trust of the people in the Church.



**Figure 26. The researcher exercising a liturgical activity in Belemboke I.** (Source: The Catholic Mission archives, 2020)

**b) Importance of missionary support:** participants like KII 3, a male adult and the entire respondents in FGD\_ BK I expressed gratitude for missionary support, highlighting its role in securing land and ensuring food security for the Bayaka. However, there were differing opinions on the sustainability of this support, with concerns raised about the long-term viability of relying solely on missionaries. While missionary support was acknowledged, there was a call for government intervention, as suggested by KII 5 a male adult, to secure indigenous lands and promote food production. Participants emphasised the importance of collaboration between the government, church, and indigenous communities to address land security and food production challenges.

**c) Challenges and uncertainties:** despite efforts to establish sustainable settlements, challenges persist. Participants, such as KII 3 male adult with a family of 7 persons and FGD\_ BK I P 26 another male adult with a family size of 8 persons, expressed concerns about the potential for external interference and the historical vulnerability of Bayaka settlements to exploitation by non-indigenous groups. However, there was also optimism, with some acknowledging the possibility of success through unity and determination.

It is reasonable to state that while there was agreement on the importance of community-driven initiatives, intermediary support, and government intervention, there' was uncertainty about the long-term sustainability of missionary support and the challenges posed by external

interference. The collected information underscored the need for collaborative efforts and innovative solutions to address the complex issues of land tenure and food security among the Bayaka.

#### **4.4. Summary of the Findings**

The study on the Bayaka of Belemboke I and IV highlights the intricate relationship between Land Tenure Systems (LTSs) and Food Security (FS) among indigenous communities. LTSs, viewed historically as communal resources integral to nomadic lifestyles, have evolved due to external pressures, with private land tenure emerging as significant for enhancing food security. Disparities between villages like Belemboke I and Belemboke IV underscore contrasting models, with the former serving as a successful example due to its stable land tenure, fostering community development.

The impact of Land Tenure Security (LTS) on Food Security (FS) is profound, with indigenous communities facing challenges such as encroachment and internal disputes threatening traditional livelihoods. Despite varying food accessibility among villages, ensuring consistent access to nutritious food remains a challenge, particularly protein sources. Gender dynamics in land ownership and decision-making processes pose additional challenges, with Bayaka women facing hurdles in asserting their land rights but playing crucial roles in sustaining traditional practices.

As a tool for social transformation, constructive external support is deemed essential, with education, advocacy, responsible resource use, and collaboration with stakeholders highlighted as crucial for addressing land tenure and food security challenges. Government intervention, partnerships, and replication of successful models like Belemboke I are advocated to develop holistic strategies. However, challenges persist, including uncertainties about the sustainability of missionary support and external interference, emphasising the need for collaborative and innovative solutions to address the multifaceted issues faced by the Bayaka communities.

It is pertinent to note at this juncture that, the first assumption of the study, that there are differences in land ownership and food security between Belemboke I and Belemboke IV, was confirmed by the findings. The results showed significant variations in land tenure systems and food availability. Belemboke I had better land ownership control and food production, which contributed to the well-being of the community. The second assumption, that participants would

understand and accurately respond to the questions, was also validated. The detailed responses of the Participants, emphasised the advantages of Belemboke I in food accessibility and land tenure systems, as well as the differences in Food Consumption Score (FCS) and Coping Strategies Index. These findings support the conclusions and generalisations of the study.

#### **4.5. Chapter Summary**

This chapter has presented the results from data collected regarding the possible contribution of land tenure systems to food security among the Bayaka of Belemboke I and IV. It has presented the impact that land security has had on them and the possible social transformational framework that can facilitate the sustainability in the core area of the study namely; LTSs and FS.

The results highlighted the significant relationship between LTS and FS among Bayaka, emphasising how private land tenure improves food security amidst changing communal resources. Disparities between villages, particularly Belemboke I's stable land tenure, contribute to community development despite challenges like encroachment and disputes, emphasising the interconnectedness of LTS and FS and the need for collaborative solutions to address the multifaceted issues faced by indigenous communities. The subsequent chapter will expand upon the ideas introduced in the preceding chapter by delving into discussions regarding the evolving social dynamics of land ownership and the involvement of various stakeholders, including government and other partners, in tackling the issues surrounding land tenure and food security.

## **Chapter 5: DISCUSSION**

### **5.1. Introduction**

This chapter highlights the importance of integrating indigenous perspectives and culturally sensitive approaches to land tenure and food security among the Bayaka in Belemboke I and IV based on the research objectives. It emphasises how traditional practices and beliefs about land ownership differ from conventional notions, prioritising a deep connection to the land. The study underscores the necessity of external support, community-driven initiatives, and legal protection to maintain the Bayaka's identity and improve their food security, aligning with Sustainable Development Goal 16.3 and the ILO Convention 169 for inclusive institutions and justice as well as the Catholic Church' position.

### **5.2. Cultural inclusive Land Tenure Systems (LTSs) and Food Security issues in Belemboke I and Belemboke IV**

The findings of the study on "The Contribution of the LTSs to FS among the Bayaka of Belemboke I and IV" emphasise the critical role of indigenous perspectives and culturally sensitive approaches to land tenure. This discussion aligns with and contrasts various studies on the Sustainable Development Goals (SDGs), enriching our understanding of the complexities surrounding indigenous land rights and their broader implications for sustainable development.

The study also underscores the importance of indigenous land tenure systems (LTSs) for the Bayaka community, which is consistent with Garnett et al. (2018), who provide empirical evidence on the global significance of indigenous lands for biodiversity conservation, highlighting the crucial role of indigenous peoples in sustainable land management. This alignment suggests that culturally inclusive land tenure not only supports food security but also promotes environmental sustainability, reinforcing the interconnectedness of SDG 2 (Zero Hunger) and SDG 15 (Life on Land).

In addition, the discussion of external pressures on the Bayaka, such as settlement by outsiders, resonates with the findings of Scheidel et al. (2023) and Agunyai and Amusan (2023). Scheidel et al. (2023) who examine the impacts of extractive and industrial development projects on indigenous lands, revealing the threats posed by unsustainable development practices. Similarly, Agunyai and Amusan (2023) highlighted how land grabbing undermines food security and sustainable development in Africa. Both studies underscore the need for robust legal

protections and policies to safeguard indigenous land rights, echoing the challenges faced by the Bayaka in maintaining their land and identity amidst external pressures.

It should also be noted that the positive impact of private land tenure on food security among the Bayaka, and as observed in Belemboke I, aligns with findings of Viana et al. (2022). They emphasize the importance of sustainable agricultural land systems and traditional land management practices in promoting food security. This perspective supports the study's findings that secure land rights enable sustainable agricultural activities and cultural preservation. However, the disparity between Belemboke I and Belemboke IV highlights the need for effective implementation and support for LTSs to ensure equitable benefits across different communities.

Furthermore, the cultural evolution towards a semi-sedentary lifestyle among the Bayaka, supported by the Catholic Mission and the government, is critiqued by Krauss (2022) regarding SDG 15. Krauss argues for more inclusive conservation practices that prioritize people and justice. This critique suggests that while semi-sedentary life offers benefits, it must be balanced with the preservation of traditional practices and equitable resource distribution, addressing the cultural and social dimensions of sustainable development. It is the same line that applying Niklas Luhmann's theory of functional differentiation to understand the varied experiences of Bayaka communities highlights the autonomy of social subsystems. This perspective is supported by Martin et al. (2020), Lew-Levy et al. (2022), and Guadalupi (2018), who emphasize the importance of equitable resource sharing and cultural traditions in fostering community well-being. The decline in traditional sharing practices due to increased agricultural efforts underscores the need to integrate socio-cultural elements into land tenure systems to maintain community cohesion and identity.

In summary, the study on the Bayaka community highlights the intricate relationship between indigenous land rights, food security, and cultural preservation. This study is consistent with broader research on the SDGs, emphasising the need for incorporating cultural inclusivity, indigenous perspectives and traditional practices into land tenure systems, and their significance in achieving the interconnected goals of food security, biodiversity conservation, and community well-being.

### **5.3. The impact of Land Tenure Security (LTS) on Food Security (FS) in Belemboke I and Belemboke IV**

This section focuses on the second research question: How does land tenure security impact food security among Bayaka of Belemboke I and Belemboke IV in Nola, Central African Republic? The findings from this study, highlight the intricate interplay between land tenure security, food procurement challenges, malnutrition, gender roles, and community dynamics in shaping their livelihoods and food security. Other studies corroborate and provide further insights into these key themes.

Additionally, the findings of this study on the Bayaka of Belemboke I and IV highlights the significant challenges they face in securing their land due to external pressures such as industrial encroachment and internal issues like manipulation and disorganisation, with the encroachment of cattle herds being particularly detrimental to their livelihoods. This is supported by Sama (2022), who notes the vulnerability of indigenous peoples' land rights in Cameroon is due to weak constitutional protections, leading to land exploitation without compensation. Inoue's (2023) Lockean *Proviso* emphasises the state's duty to secure citizens' basic needs, aligning with the need for legal protection of the Bayaka's land to ensure food security. These findings underscore the critical need for robust legal frameworks to protect indigenous land rights, essential for sustaining their livelihoods and ensuring food security.

The study aligns with Sustainable Development Goal (SDG) 2, aiming to ending hunger and promoting sustainable agriculture, noting its relevance across all SDGs. It highlights widespread malnutrition among the Bayaka, particularly in children under 5, with larger families facing greater food insecurity. Research by Drysdale et al. (2021) links food insecurity to malnutrition, with urban South African households experiencing higher stunted growth rates. Hall et al. (2019) found that higher forest cover in Malawi improves diet quality. These findings emphasise the complex nature of malnutrition, influenced by environmental conditions and family size, necessitating integrated approaches to enhance food security and nutrition. It is in the same line that Szetey et al. (2021) emphasised the importance of localising and context-specific approaches in implementing SDGs and advocate for community involvement in developing sustainability plans. They further highlight the need for integrated rural and urban planning to address climate action (SDG 13). These studies align with the findings on the Bayaka,

underscoring the necessity of engaging local communities and tailoring strategies to local realities for successful SDG implementation.

Additionally, the Bayaka's reliance on hunting is diminishing, leading them to gather alternative protein sources like caterpillars and snails. Despite openness to new farming practices, implementation faces significant challenges. Fungo et al. (2020) demonstrate the importance of wild forest foods in ensuring food security and dietary diversity among rural populations in the DR Congo, Cameroon, and Gabon. Patterson et al. (2021) highlight the high food insecurity among the Batwa people in Uganda, stressing the need for appropriate measures to address indigenous food procurement challenges. These findings support the necessity of enhancing traditional food procurement methods and integrating sustainable agricultural practices to improve food security among indigenous communities.

Furthermore, gender complementarity is crucial for the Bayaka, with secure land rights and inclusive decision-making for women being essential for sustainable livelihoods. Keovilignavong and Suhardiman (2020) in Laos emphasise the importance of considering livelihoods in land administration, suggesting that policies should prioritise people's needs, particularly those of women in indigenous communities. Ensuring gender-inclusive land rights and decision-making processes is vital for promoting sustainable livelihoods and enhancing food security in indigenous communities.

There is disagreement among the Bayaka over the effectiveness of collaboration with the Bilos. At this point, Kalemba (2017) recall the "*Zo kwe Zo*" world perspective, advocating for human rights and community-based approaches to development, which aligns with the need for respectful and effective local collaborations; among the Bayaka and the Bilos. Constructive external collaborators such as NGOs must respect the autonomy and cultural practices of indigenous communities, ensuring that interventions enhance rather than undermine food security and community cohesion.

This study has highlighted the intricate link between land tenure security and food security among the Bayaka in Belemboke I and IV, threatened by external encroachment and internal issues. It has revealed widespread malnutrition, particularly in children, and stresses the need for integrated approaches to enhance food security. Gender-inclusive land rights and decision-making are crucial for sustainable livelihoods. Effective collaboration with the Bilos, respecting Bayaka

autonomy, and robust legal frameworks are essential to protect indigenous land rights, aligning with Sustainable Development Goal 2. In order to realise this, there will be need for radical changes.

#### **5.4. Social transformational framework for Bayaka's LTSs and FS**

This section focuses on the question: What social transformational framework for land tenure systems and food security can be established among the Bayaka of Belemboke I and Belemboke IV in Nola, Central African Republic? The result of this study on the Bayaka communities in Belemboke I and Belemboke IV identified several key themes crucial to extract the necessary elements that facilitate the proposal of a framework in themes of land tenure systems (LTSs) and food security (FS) among Bayaka. This discussion compared and contrast these findings with other research to provide a broader perspective on land and food security.

The findings emphasised the integration of traditional practices and indigenous knowledge with modern approaches for holistic and sustainable development. The responses from our key informants highlighted the importance of community-driven initiatives and the incorporation of traditional Bayaka practices to enhance sustainability. This aligns with the findings of Keovilignavong and Suhardiman (2020) in Laos, which emphasised prioritising the livelihoods of local communities and integrating indigenous practices into land administration systems to enhance food security and sustainable development. Similarly, Tessema (2019) in Ethiopia found that effective land certification and tenure security, which respect traditional practices, significantly improve agricultural productivity and food security.

The outcome of this study underscored the necessity of constructive external support, particularly in terms of education, advocacy, and government intervention. This mirrors the findings of Chigbu et al. (2019) in Rwanda, where tenure-responsive land-use planning and external support improved food security by ensuring more effective land consolidation and management practices. Additionally, Sama (2022) highlighted the importance of legal frameworks protecting indigenous land rights, similar to our study's call for government intervention to protect Bayaka territories and promote food production.

The study identified the critical role of intermediary agents and missionaries in securing land and food for the Bayaka. However, it also noted concerns about the long-term sustainability of relying solely on missionaries. The success of intermediary roles and external support systems

in facilitating fair agreements and trust-building can significantly enhance land and food security, as demonstrated in various regions including Central Africa.

Despite the progress, challenges such as potential external interference and historical vulnerabilities persist. This is consistent with findings from Permunta (2019) on the Baka Pygmies of Cameroon, where external pressures and land restrictions negatively impacted food security and cultural practices. The historical exploitation and current land tenure challenges faced by the Bayaka highlight the need for strong legal protections and sustainable support systems, as seen in the broader regional contexts.

The Lockean *proviso*, which emphasizes that property rights should not disadvantage others, provides a relevant ethical framework for addressing land and food security issues among the Bayaka. Inoue (2023) supports this by arguing that states have a duty to ensure food security for all citizens, aligning with our study's call for inclusive and just land tenure systems. Moreover, the 2030 Agenda for Sustainable Development Goals (SDGs) emphasizes leaving no one behind, integrating social, environmental, and economic dimensions of sustainable development (Trane et al., 2023).

The insights from other studies enhance our understanding of key themes identified in this research: integrating traditional practices with modern methods can boost agricultural productivity and resource sustainability, thereby improving food availability (Keovilignavong & Suhardiman, 2020). Constructive external support and legal frameworks are crucial for securing land rights and improving food accessibility (Sama, 2022; Chigbu et al., 2019). Respecting indigenous knowledge and practices enhances food utilisation by ensuring that food production methods align with cultural practices and ecological conditions (Tessema, 2019). Collaborative efforts between government, communities, and intermediary agents can provide the stability needed to sustain food security initiatives and protect against external threats, thereby promoting food stability (Kumeh et al., 2022; Permunta, 2019).

The study findings on the transition of the Bayaka people from a nomadic to a semi-sedentary lifestyle reveal crucial issues related to land tenure and food security, aligning with the goals of SDG Target 16.3 and ILO Convention 169. Both aim to uphold the rule of law, ensure equal access to justice, and protect indigenous peoples' rights. The ILO Convention 169, Article

14 offers a strong legal basis for the rights of the Bayaka (Soma, 2020) recognising their ownership of traditionally occupied lands and requiring governments to identify and protect these lands.

The struggle of Bayaka for land rights and cultural preservation, amidst pressures from neighbouring groups and organisations, underscores the need for legal recognition and protection as emphasised by SDG 16.3 and ILO Convention 169 to combat marginalisation and enhance food security. Facing social discrimination and exploitation, particularly by the Bilo, the Bayaka experience modern slavery (Boyd et al., 2021). The emphasis of SDG 16.3 on inclusive institutions and justice, along with Convention 169's acknowledgment of indigenous rights and requirement for consultation and participation, aims to address these inequalities by protecting the Bayaka and involving them in decision-making.

The study highlights ongoing issues such as the superiority and inferiority complex between the Bilo and the Bayaka, and the impact of Western influences on local dynamics. These complexities illustrate the challenges in effectively and respectfully implementing SDG 16.3 and Convention 169. The persistence of these social hierarchies and the continued marginalisation of the Bayaka indicate that achieving these targets requires more than legal reforms; it necessitates a transformation of societal attitudes and power structures.

The researcher believes that in line with SDG 16.3 and ILO Convention 169, the study on the Bayaka communities in Belemboke I and IV has emphasised the significance of legal recognition and preservation of Bayaka land rights. It has stressed on the necessity of including Bayaka in decision-making processes to fight social inequality and exploitation, in line with the Convention's objectives and more general sustainable development goals.

## **5.5. Chapter Summary**

The study emphasises the significance of indigenous land tenure systems (LTSs) in promoting food security and environmental sustainability, aligning with Sustainable Development Goals (SDGs) 2 and 15. It notes external pressures like industrial encroachment and land grabbing that threaten Bayaka land rights and underscores the importance of robust legal protections. The study discusses the positive impact of private land tenure on food security and the need for equitable implementation across communities. It critiques the cultural shift towards semi-sedentary lifestyles, stressing the balance between traditional practices and modern development.

The study equally underscored the widespread malnutrition among the Bayaka, particularly in children, and the importance of integrated approaches to enhance food security. It highlights the Bayaka's diminishing reliance on hunting and the need for sustainable agricultural practices. The study also calls for gender-inclusive land rights and decision-making as crucial for sustainable livelihoods. The study proposes a social transformational framework for land tenure systems and food security among the Bayaka. It emphasises integrating traditional practices with modern approaches, community-driven initiatives, and external support. The study calls for legal recognition and protection of Bayaka land rights, consistent with ILO Convention 169 and the SDG 16.3, and stresses the need to combat social discrimination and exploitation by involving Bayaka in decision-making. In the next chapter, the study presents the transformative orientations that emerged from the research findings. The researcher address the limitations encountered during the investigation and proposes recommendations to address the identified challenges.

## **Chapter 6: TRANSFORMATIVE ORIENTATIONS**

### **6.1. Introduction**

This chapter is comprised of the theological reflection. It also critically examines the limitations in studying land tenure systems (LTS) and food security (FS) within Bayaka communities. While offering local insights, the chapter outlines transformative strategies and recommendations to secure Bayaka land rights and promote food security through legal advocacy, community empowerment, inclusive decision-making, collaborative partnerships, and awareness-raising efforts. It also suggests areas for future research to continue addressing these critical issues. It ends with the reflexivity of the researcher that called for collective action in order to foster a just and sustainable future for the Bayaka and other indigenous communities.

### **6.2. Theological reflection**

Belemboke 1 and IV in Sangha Mbaere, Central African Republic, are influenced by the region's predominant religions. Christianity is practiced by 89% of the population, with Protestants at 61% and Catholics at 28%. Islam follows at 9%, and traditional beliefs are at 1% (Gallagher, 2024). The Bayaka people are primarily followers of traditional religions. This religious diversity informs the study of the Bayaka's land tenure and food security issues. By exploring the Bayaka's religious and cultural values, the research aims to understand how these beliefs influence their community welfare and perceptions of life.

#### **6.2.1. The Sacred Traditions of *Ekila* and among the Bayaka**

In many traditional African cultures, land is viewed as a communal resource essential for the community's identity and survival, emphasising stewardship and collective responsibility over private ownership. This perspective fosters a strong connection to the land and encourages sustainable practices. However, colonialism introduced private freehold land ownership systems that conflicted with these communal values, prioritizing individual rights and often disregarding established communal relationships. As a result, significant portions of land remain unregistered or undocumented, leading to challenges in land tenure security. Today, land ownership in Africa involves a complex mix of state-owned, freehold, and customary systems, necessitating policies that respect traditional practices while addressing modern legal and economic contexts (Akinola, 2019).

In Bayaka society, sharing extends far beyond the mere exchange of material goods; it encompasses a profound ethic of communal reciprocity and equitable distribution. Guided by the sacred principles of *Ekila*, the Bayaka meticulously allocate resources, ensuring that all community members receive their fair share, regardless of age or status. This deeply rooted tradition not only ensures their physical well-being but also fosters a sense of harmony and collective interdependence. According to Bayaka beliefs, the forest and its resources are meant to be shared by all creatures, and rules like *Ekila* stem from this idea that *Komba*, the creator, made the forest for all creatures to share. Thus, when confronted by a silverback gorilla claiming territory, Bayaka men react with indignation, as no individual or species holds superior rights over the forest. This likely explains their resilience against external efforts to impose Western concepts of development concerning ecological and environmental conservation (Kandza et al., 2023).

### **6.2.2. Biblical Foundations of Land Tenure Systems (LTSs) and Food Security (FS) in the Bayaka Communities**

There are plethora biblical passages to back up the main variable of this research. For the sake of specificity, the researcher limited himself to few scriptural passages. The challenges faced by the Bayaka communities regarding land tenure and food security resonate deeply with biblical principles of justice, equity, and God's concern for the poor and marginalised. In villages like Belemboke I and IV, disparities in land tenure stability reflect the biblical vision of a just society where everyone has secure access to land and its benefits. Belemboke I, with stable land tenure, supports community development, whereas Belemboke IV struggles with encroachment and internal disputes that threaten traditional livelihoods. This situation mirrors the prophet Amos' condemnation of the unjust accumulation of land by the wealthy at the expense of the poor (Amos 2:6-7, 5:11, 8:4-6). Ensuring the Bayaka's land rights is crucial for their food security and sustaining their way of life, echoing Amos' call for equitable land distribution.

Furthermore, the gender dynamics observed, where Bayaka women face challenges in asserting their land rights despite their vital roles, contradict the biblical vision of justice and equity. The New Testament reinforces this concern for the poor and oppressed, with James condemning the exploitation of workers and unjust accumulation of wealth (James 5:4). The successful model of Belemboke I offers hope, showing how secure land tenure can foster

community development and food security. This aligns with the teachings of Jesus on trusting in God's provision and not being anxious over food (Matthew 6:25), and the promise that "the meek...will inherit the earth" (Matthew 5:5), suggesting a future reallocation of land rights to the humble and marginalised.

The Bayaka's situation calls for a holistic, collaborative approach rooted in biblical principles of justice, stewardship, and care for the poor and vulnerable. External support through education, advocacy, responsible resource use, and partnerships with stakeholders is essential, echoing the biblical mandate to uplift the oppressed and work towards a more equitable distribution of resources. The challenges are complex, but the biblical foundations provide a moral imperative to address land tenure and food security issues with compassion, wisdom, and a commitment to justice for all, especially indigenous communities like the Bayaka who have been marginalised and dispossessed.

Through collective efforts guided by these principles, a path towards a more just and sustainable future can be forged, where all have secure access to the land and its life-giving fruits. This approach not only addresses the immediate needs of the Bayaka but also upholds the broader biblical vision of a society grounded in justice, equity, and the responsible stewardship of resources, ensuring a more equitable and sustainable future for all.

The Bayaka communities face significant challenges related to land tenure and food insecurity, which resonate deeply with the principles of Catholic social teaching. The findings highlight the profound impact of secure land tenure on the Bayaka's traditional livelihoods, cultural heritage, and overall well-being, aligning with the Church's recognition of private property as essential for human dignity and freedom (*Compendium* #176). However, external encroachment and internal disputes threaten the Bayaka's land access, contravening the Church's call for a widespread and equitable distribution of productive property like land (*Rerum Novarum, Populorum Progressio*). The prevalence of malnutrition among children and vulnerable groups within the Bayaka communities starkly contrasts with the Church's affirmation of the fundamental right to adequate nutritious food for a truly human life with dignity. This situation calls for a priority concern and preferential option for the poor and vulnerable, as hunger and food insecurity diminish human life and dignity (Pope Francis, 2020).

The findings also underscore the interconnectedness between land ownership, family size, and food satisfaction, highlighting the need for responsible stewardship of resources and sustainable agricultural practices as advocated by the Church's teachings on environmental care and long-term food availability (Pope Francis, 2015). Addressing these multifaceted challenges requires a holistic approach rooted in Catholic social teaching principles. The Church's call for solidarity and subsidiarity urges collaborative efforts that empower Bayaka communities to lead local initiatives and solutions while fostering partnerships with stakeholders and advocating for responsible government intervention (Pope Francis, 2020).

Additionally, the Church's justification for expropriating and redistributing underutilised landholdings provides a moral framework for addressing the inequitable concentration of land ownership and ensuring equitable access to productive resources for the Bayaka and other marginalised communities (Towards a Better Distribution of Land #36). Pope Francis' encyclicals, "*Fratelli Tutti*" and "*Laudato Si'*," offer profound insights and guidelines that align with addressing the Bayaka's plight. "*Fratelli Tutti*" emphasises the importance of fraternity and social friendship, recognising the intrinsic dignity of every human being and fostering a culture of solidarity and inclusivity. This encyclical calls for new political approaches that prioritise the common good and the dignity of every human being over financial interests and power struggles (Pope Francis, 2020). "*Laudato Si'*" addresses the urgent need for environmental protection and a call to ecological conversion, emphasising the interconnectedness of human and environmental well-being (Pope Francis, 2015).

Ultimately, the Bayaka communities' situation demands a response grounded in the Church's commitment to upholding human dignity, promoting the common good, and protecting the rights and well-being of the poor and vulnerable. By following these principles, a more just and sustainable future can be achieved. Collective efforts guided by these principles can forge a path where the Bayaka and all people have secure access to land and its life-giving fruits, enabling them to flourish and preserve their cultural heritage for generations to come.

### **6.3. Conclusion**

This thesis has demonstrated the crucial relationship between land tenure security and food security among the Bayaka community in Belemboke I and IV, Central African Republic. The findings indicate that secure land tenure systems significantly enhance food security, even as communal resources decline. The study highlights the importance of stable land tenure in fostering community development, despite challenges such as encroachment and disputes. The interconnectedness of land tenure security and food security underscores the need for collaborative solutions involving various stakeholders, including government authorities and non-governmental organisations (NGOs).

The research emphasises the importance of robust legal protections and equitable implementation of land tenure systems to counter external pressures such as industrial encroachment and land grabbing. Additionally, it highlights the need to balance traditional practices with modern agricultural developments, particularly as the Bayaka community shifts towards semi-sedentary lifestyles. Furthermore, the study advocates for gender-inclusive land rights and decision-making processes to ensure sustainable livelihoods and address widespread malnutrition, particularly among children.

Finally, this research contributes to the broader goals of social transformation and sustainable development by providing insights into the complex relationships between land tenure security, food security, and environmental sustainability. The findings have significant implications for policymakers, practitioners, and researchers seeking to promote sustainable development and social transformation in the Central African Republic and similar contexts.

### **6.4. Recommendations**

This study presents recommendations for various stakeholders to support the Bayaka community effectively. By implementing legal protections, integrating traditional and modern agricultural practices, ensuring community-driven initiatives, embodying the principles of *Evangelii Gaudium*, and enhancing NGO engagement, these recommendations aim to foster sustainable development, preserve cultural heritage, and promote social and economic well-being.

#### **6.4.1. Local and the National Government Authorities**

This study recommends implementing legal frameworks such as the International Labour Organisation (ILO) Convention 169 to safeguard Bayaka land rights and promote food security, in alignment with UN Sustainable Development Goal 16.3. Additionally, there is need to integrate traditional knowledge with modern agricultural practices through workshops, training programs, and participatory planning involving the Bayaka community. This approach will foster national development and support green economies, including carbon offset programs and anti-poaching efforts. Combining legal protections with educational initiatives will ensure sustainable development and the preservation of both cultural heritage and natural resources.

#### **6.4.2. Leaders of the Bayaka Communities**

Community-driven Initiatives should be the primary concern of every member. Solutions tailored to the community's specific needs and driven by members' involvement are essential for sustainability and effectiveness. Thus, the gender-role in sustainability which is ensuring that women and men play their role in securing the wellbeing of the clans. Resistance to manipulation through alcohol and other forms of indebtedness is crucial for sustainable livelihoods and community development.

#### **6.4.3. Catholic Pastoral Agents**

Continue to accompany and advocate for the rights of vulnerable communities like the Bayaka, focusing on upholding human dignity, land rights, and food security, while embodying the principles of *Evangelii Gaudium*. Emphasise the joy of encountering Jesus Christ, the central role of the Gospel message, and the need for the Church to be missionary and welcoming to all, especially the marginalised. Integrate evangelisation into social and economic dimensions, ensuring that efforts to serve the poor are infused with the joy and love that restore meaning to life, as emphasized by Pope Francis.

#### **6.4.4. Non-Governmental Organisations (NGOs)**

In order to improve participation and data accuracy, there is a need to strengthen trust and use culturally appropriate methods while re-evaluating NGO engagement with the Bayaka to address existing challenges more effectively. Additionally, provide more resources, including funding and skilled personnel, to advocate for stronger legal protections and government policies that support land tenure security and food security for indigenous communities.

## **6.5. Limitation of the Work and Suggestions for further Research**

The study offers a comprehensive examination of land tenure systems (LTS) and food security (FS) within the Bayaka communities. However, it may lack depth in exploring the broader regional and global contexts surrounding these issues. While effectively addressing local concerns, the study could benefit from a comparative analysis with other indigenous communities facing similar challenges related to LTS and FS. This broader perspective could provide a more holistic understanding of the implications of LTS on FS.

Methodologically, the study's reliance solely on qualitative data analysis, although thorough, could be strengthened by incorporating quantitative methods. A mixed-methods approach, combining qualitative insights with statistical validation, would offer a more robust analysis and reinforce the findings. However, the research involved a multi-faceted data collection methods that ensured reliable findings.

While acknowledging external pressures and encroachments affecting the Bayaka's land security, the study may not fully account for the complex political and economic dynamics at play. These external factors could potentially introduce biases and influence the outcomes of the research in ways that are not fully explored or addressed. However, the mechanisms put in place as shown in chapter three, shielded our findings from misleading findings.

In summary, the scope of the study could be expanded to include broader regional and global comparisons, its methodology could be enhanced through a mixed-methods approach, and a deeper examination of external political and economic influences could provide a more comprehensive understanding of the issues surrounding LTS and FS for the Bayaka communities. The need for transformative action calls for a systematic plan.

## **6.6. Ministerial Action Plan**

Based on the findings, the researcher suggests as transformative orientation, a brief plan for social justice advocacy with practical strategies and concrete actions. The objective in the plan will be: to secure land rights and promote food security for the Bayaka indigenous community through a collaborative, culturally-sensitive, and sustainable approach.

The plan stated here aims to address the multifaceted challenges faced by the Bayaka community through a comprehensive approach that combines legal and policy advocacy,

community enablement, inclusive decision-making, collaborative partnerships, and awareness-raising efforts. By involving all stakeholders and respecting the cultural practices of the Bayaka, this plan strives to achieve sustainable solutions that secure land rights, promote food security, and foster social justice. Each action should be carried out consistently over the period to ensure long-term impact and sustainable development within the Bayaka community. The plan takes the following shape:

**Table 5. Ministerial action plan**

<b>ACTION</b>	<b>Legal and Policy Advocacy</b>	<b>Awareness and Education</b>	<b>Community Empowerment and Capacity Building</b>	<b>Inclusive Decision-Making</b>	<b>Collaborative Partnerships</b>
<b>WHO</b>	The Government, NGOs	NGOs, The Government, The Catholic Missionaries	NGOs, Bayaka community	The Government, NGOs, Bayaka community	NGOs, The Government, Collaborative projects with the Bayaka
<b>STRATEGY / HOW</b>	Lobby for the implementation of ILO Convention 169 and enact policies to safeguard indigenous land tenure and promote food security.	Conduct innovative awareness campaigns, develop educational materials, and engage with media.	Conduct workshops integrating traditional knowledge with modern practices, facilitate participatory planning.	Ensure equal representation of women, establish inclusive forums for community participation.	Foster collaborations with stakeholders, respecting cultural practices. Encourage innovative conservation programs.
<b>WHEN</b>	Start immediately, ongoing advocacy throughout the period.	Start in 2025 and maintain continuous efforts.	Commence in 2025 and continue with periodic training sessions.	Begin in 2025 and continue throughout the period.	Start in 2025 and continue with ongoing partnerships.
<b>OUTCOME</b>	Improved legal protections for Bayaka land rights and enhanced food security policies.	Increased public awareness, policy changes, and cultural sensitivity, leading to sustainable development.	Enhanced skills, self-advocacy, and sustainable development within the Bayaka community.	Improved representation and participation, leading to more equitable decision-making processes.	Enhanced resources, support, and understanding, leading to effective solutions.

## **6.7. Reflexivity**

The uniqueness of this study lies in the establishment of the Bayaka village of Belemboke with the support of the Catholic Mission and Central African government assistance, which still stands today. As a pastoral agent who has spent a decade in this area, it was challenging to set aside my biases during the study. Many Bayaka from different settlements participated in the research, facilitating the pilot test. Throughout the research, I remained aware of how my positionality might influence the interpretation and presentation of the findings. Conducting key interviews with Bayaka informants required patience and prudence, and considerable time was spent obtaining and analysing information gathered during focus group discussions and participant observations. My conviction in the importance of this research kept me motivated despite occasional discouragement. The data treatment felt like climbing a hill, but I was pleasantly surprised by a significant portion of the findings.

In conducting this research, I critically examined my biases and the potential influence of my perspective on the study's findings. I recognised the need to deconstruct old educational curricula and initiate an unlearning process to relearn as objectively as possible. This reflexivity ensured that the research respected the Bayaka's cultural heritage and rights while advocating for equitable and sustainable solutions. Reflecting on the historical context, the involvement of the Catholic Mission in establishing Belemboke highlighted the church's role as a social transformer, prioritising community development and defending the oppressed before engaging in faith sharing at the Bayaka's request. This historical perspective enriched my understanding of the current dynamics in Belemboke, where the Bayaka are now protagonists of social transformation. The support of the Central African government is crucial in preserving the environment and ecosystem. I hope this work will contribute in its own small way to the body of science.

## **6.8. Chapter Summary**

This chapter delved into the profound influence of religious diversity on the daily lives of the Bayaka, particularly in shaping their perceptions of land tenure and food security. Guided by the sacred principles of Ekila, the Bayaka uphold communal reciprocity, ensuring equitable distribution of resources. Additionally, biblical foundations support their struggles, echoing principles of justice, equity, and concern for the marginalised. Catholic social teachings further emphasise the importance of upholding human dignity and promoting the common good, offering a framework to address Bayaka's challenges and work towards a just and sustainable future.

Furthermore, the chapter underscores the critical relationship between land tenure security and food security among the Bayaka community, advocating for collaborative, culturally-sensitive approaches to address their challenges and promote sustainable development. Recommendations include legal and policy advocacy to safeguard Bayaka land rights, community empowerment through capacity-building programs, inclusive decision-making processes, and collaborative partnerships with stakeholders, and awareness and education initiatives. The chapter also highlights the need for further research to include broader regional comparisons, employ a mixed-methods approach, and explore external influences on land tenure and food security. Finally, the ministerial action plan proposes a transformative advocacy approach to secure Bayaka land rights and promote food security, while acknowledging biases and preserving their cultural heritage.

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## APPENDICES

### **Appendix A: Introduction Letter (for Key Informant Interviews)**

Dear Participant,

My name is Ishola Anselme Yonlonfoun, currently enrolled as a student at Tangaza University. I am pursuing a Master's degree in Social Transformation with a specialisation in Sustainable Development. As part of my academic program, I am undertaking a research project to meet the requirements of a course. In this study, the Bayaka of Belemboke I and Belemboke IV in Nola, Central African Republic, are examined to unravel how land tenure systems affect food security among them and how it can serve as a tool for social transformation.

I kindly request your permission to engage you as a resource person in your area of specialization; having interacted with Bayaka issues. There is a set of questions aimed at acquiring your ideas, opinion, and perceptions on several issues regarding the topic under study. I look forward to your response on a suitable time and venue for an interview with you.

Your responses will be kept in the strictest confidence and used only for learning during this study process.

I thank you in advance for your consideration and willingness to participate in this study.

Ishola Anselme Yonlonfoun.

## **Appendix B: Introduction Letter (for Focus Group Discussion)**

Dear Participant,

My name is Ishola Anselme Yonlonfoun, currently enrolled as a student at Tangaza University. I am pursuing a Master's degree in Social Transformation with a specialisation in Sustainable Development. As part of my academic program, I am undertaking a research project to meet the requirements of a course. In this study, the Bayaka of Belemboke I and Belemboke IV in Nola, Central African Republic, are examined to unravel how land tenure systems affect food security among them and how it can serve as a tool for social transformation.

I kindly request your permission to engage you as an experienced person in the community. There is a set of questions aimed at acquiring your ideas, opinion, and perceptions on several issues regarding the topic under study. Kindly feel free to participate in the group as you respond to the questions to the best of your capacity and understanding.

Your responses will be kept in the strictest confidence and used only for learning during this study process.

I thank you in advance for your consideration and willingness to participate in this study.

Ishola Anselme Yonlonfoun.

**Appendix C: Informant Consent Form**

*Contribution of land tenure systems to food security among the Bayaka of Belemboke I and Belemboke IV in Nola, Central African Republic.*

**Consent to take part in the study**

**Participant's code number.....**

- I understand that my involvement in this research is optional, and I have the freedom to withdraw at any time or decline to respond to a question without the requirement to provide an explanation.
- I have understood the objective and essence of this study.
- I acknowledge that I will not receive any direct financial compensation from this study.
- I understand that I am not required to give any personal information and that my identity will remain confidential.
- I am aware that the information I provide will be handled confidentially.
- By signing this document, I grant my consent for the inclusion of the information I provide in this study.

\_\_\_\_\_  
Signature of participant

\_\_\_\_\_  
Date

I recognise that the participant has given their consent to take part in the study.

\_\_\_\_\_  
Signature of researcher

\_\_\_\_\_  
Date

**Appendix D: Demography of the Bayaka**

1) How old are you?

18-30 years  31-70 years

2) Gender: Male  Female

3) Status: Married  Single  Widowed

4) How many members are in your household?

.....

5) What is your source of income?

Salary  Hunting and farming  Temporal job  Others

## **Appendix E: Photo Consent Form**

**Study Title:** *Contribution of land tenure systems to food security among the Bayaka of Belemboke I and Belemboke IV in Nola, Central African Republic*

**Purpose:** This form requests your permission to be photographed as part of the above-mentioned ethnographic study. These photographs will be used for research purposes and may be included in publications or presentations related to this study.

- I understand that my participation in being photographed is entirely voluntary.
- I grant permission for photographs of me to be taken and used for research purposes related to this study.
- I understand that these photographs may be used in academic publications, presentations, or other research-related materials.
- I am aware that my name will not be associated with any photographs, maintaining my anonymity.
- I have been informed that most individuals in the photographs are not actual study participants, which helps maintain the confidentiality of research participants.
- I acknowledge that this approach allows for visual documentation of the community while respecting individual privacy and research ethics.

By signing below, I indicate that I have read and understood this consent form and agree to be photographed under these terms.

Participant's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Researcher's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## **Appendix F: Questionnaire and focus group guide**

### **Instructions**

Kindly and freely answer the questions according to your experience on the subject matter.

### **Objective 1: On the contribution of the LTSs to FS among the Bayaka of Belemboke I and Belemboke IV**

- 1) What can you say of the Bayaka's concept of right to land ownership?
- 2) What is your opinion on land tenure and its contribution to food security in your village?
- 3) In your opinion, is there any difference in land tenure and availability of food between Belemboke I and Belemboke IV?
- 4) What are the challenges that you face in securing land and food in your community?

### **Objective 2: On the impact of land tenure security and food security among Bayaka of Belemboke I and Belemboke IV (the 2 in order to highlight the difference).**

- 1) How accessible is food to you in your village? Rate it between 1 and 10.
- 2) What can you say about the quality and safety of food produced or collected in your village?
- 3) How many times did you eat the following groups of food: (starches\*2) + (pulses\*3) + vegetables + fruit + (meat\*4) + (dairy\*4) + (fats\*.5) + (sugar\*.5) in household in the last 7 days? In your opinion, do you think that many eat to your satisfaction on a daily basis?
- 4) Were you in any difficulty in the last 7 days? If yes, how did you cope with it using any of the following: (Eating less preferred foods\*3 / skipping meals\*3 / engaging in illegal poaching\*3 / requesting an advance on salary\*2 / limiting portion sizes\*1 / and producing roofing material\*1).
- 5) How will you describe the indices on malnutrition among the people, especially the children?
- 6) In your opinion, does the land tenure system practiced in Belemboke I and IV contributes to the wellbeing of the community members?

**Objective 3: On a social transformational framework for land tenure systems and food security be established among the Bayaka of Belemboke I and Belemboke IV**

- 1) What are the possible opportunities in securing land and food in Bayaka communities?
- 2) What do you think can be done to ameliorate the situation land tenure and food security among the Bayaka of Belemboke I and Belemboke IV?
- 3) If granted their own space, will Bayaka be able to manage to attain food sufficiency without intermediary agents?
- 4) On the scale of 1 to 10, to what extent will you like a better version of Belemboke I be replicated in other Bayaka communities in your opinion?

**Appendix G: Interview Guide for Non-Indigenous participants that are acquainted with the Bayaka livelihood and the Bayaka key informants**

**Instructions:** Fill in the blank spaces and tick  the relevant boxes appropriately. Also feel free to respond by writing at your own convenience.

❖ How many years have you worked in the area?

Less than five years  more than 5 years  over 10 years

▪ **Objective 1: On the Contribution of the LTSs to FS among the Bayaka of Belemboke I and Belemboke IV**

- 1) What is your opinion on land tenure and its contribution to food security among the Bayaka?
- 2) In your opinion, is there any difference in land management and availability of food between Belemboke I and Belemboke IV?
- 3) What are the challenges encountered by the Bayaka of Belemboke I and Belemboke IV in securing land and food in your opinion?
- 4) What can you say of the Bayaka's relation to the right to land ownership?

▪ **Objective 2: On the impact of land tenure security and food security among Bayaka of Belemboke I and Belemboke IV**

- 1) How accessible is food to the observed communities? Rate it between 1 and 10.
- 2) What can you say about the quality and safety of food produced or collected in the two communities?
- 3) How many times did you eat the following groups of food: (starches\*2) + (pulses\*3) + vegetables + fruit + (meat\*4) + (dairy\*4) + (fats\*.5) + (sugar\*.5) in household in the last 7 days?
- 7) What can you say about the coping strategies among the Bayaka in times of difficulties in land issues and food insufficiency? (How did you as Bayaka cope the last time you were in difficulty using any of the following: (Eating less preferred foods\*3 / skipping meals\*3

/ engaging in illegal poaching\*3 / requesting an advance on salary\*2 / limiting portion sizes\*1 / and producing roofing material\*1).

- 4) In your opinion, does the land tenure system practiced in Belemboke I contributes to the wellbeing of the community members?
- 5) How will you describe the indices on malnutrition among the people, especially the children?

▪ **Objective 3: On a social transformational framework for land tenure systems and food security be established among the Bayaka of Belemboke I and Belemboke IV**

- 1) What are the possible opportunities in securing land and food in Bayaka communities?
- 2) What do you think can be done to ameliorate the situation land tenure and food security among the Bayaka of Belemboke I and Belemboke IV?
- 3) If granted their own space, will Bayaka be able to manage to attain food sufficiency without intermediary agents?
- 4) On the scale of 1 to 10, to what extent will you like a better version of Belemboke I be replicated in other Bayaka communities in your opinion?

WE APPRECIATE YOUR PARTICIPATION IN THE STUDY

## **Appendix H : Participant Observant guide**

- 1) The main socio-economic activities of the two communities
- 2) How the communities relate to land (space)?
- 3) Farming activities in the two communities.
- 4) Availability of food in term of domestic production and food storage.
- 5) Accessibility of food in what concerned equitable distribution, affordability and purchasing power.
- 6) Utilisation in terms of food safety and quality as well as nutritional knowledge.
- 7) Hunting and gathering activities in different groups.
- 8) Ability of the community to afford basic needs such as food, clothing, education, health and justice.
- 9) Coping strategies of different members of the two communities.
- 10) How the communities relate with the Bilo in terms of land adjudication and food sufficiency.
- 11) Community understanding of development in term of sustainable livelihood (Human, Social, Economic and Environment).
- 12) The relation of the two communities to the church pastoral agents in securing land tenure systems and food security.

## Appendix I: Map of the Study Area



Figure 27 The map indicating the position of Belemboke in Sangha-Mbaere, CAR

## Appendix J: Ethics Clearance



# TANGAZA UNIVERSITY COLLEGE

The Catholic University of Eastern Africa

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OUR Ref: DPGSR/ER/10/2023

Date: 6<sup>th</sup> October 2023

Yonlonfoun Ishola Anselme  
Institute for Social Transformation  
School of Arts & Social Sciences  
Tangaza University College

Dear Ishola,

**RE: ETHICS CLEARANCE FOR YONLONFOUN ISHOLA ANSELME REG. NO. ST58/00001/2021**

Reference is made to your letter dated 12<sup>th</sup> September 2023 requesting for ethical clearance of your research proposal to carry out a study on "*Contribution of land tenure systems to food security among the Bayaka in Nola, Central African Republic*".

I am pleased to inform you that, your research proposal has been reviewed and you can apply for research permit from the authorised body as regards research involving human subjects in the Central African Republic. This should be done before commencing the data collection. You are also advised to adhere to the code of ethics as regards the protection of human subjects during the entire process of your study.

This approval is valid for one year from **6<sup>th</sup> October 2023**.

Please, ensure that after the data analysis and final write up, you submit a soft copy of the thesis to the Director of Research & Postgraduate Studies – Tangaza University College for records purposes.

Yours sincerely,



**DR. DANIEL M. KITONGA (Ph.D.)**

*Director, Research & Postgraduate Studies*

Tangaza University College

CC: **Dr. Aloys O. Ojore** – Programme Leader, M.A. Social Transformation (IST)

## Appendix K: Research Permit



# TANGAZA UNIVERSITY COLLEGE

The Catholic University of Eastern Africa

OFFICE OF THE DIRECTOR OF RESEARCH & POSTGRADUATE STUDIES

E-mail: [dir.pgsr@tangaza.ac.ke](mailto:dir.pgsr@tangaza.ac.ke) Website: [www.tangaza.ac.ke](http://www.tangaza.ac.ke)

OUR Ref: DPGSR/ER/10/2023

Date: 6<sup>th</sup> October 2023

### To Whom It May Concern

Dear Sir/Madam,

**Re: Research Permit for Yonlonfoun Ishola Anselme**

This is to confirm that the person named in this letter is a student at Tangaza University College (TUC). He is registered in the Institute for Social Transformation (Reg. No. ST58/00001/2021) and he is pursuing M.A degree in Social Transformation.

Ishola has met all our provisional academic requirements leading to data collection. However, he cannot proceed to the field before getting a Research Permit from the relevant body in-charge of research ethics in the Central African Republic where he intends to undertake his study. Kindly assist him to process the permit for data collection for his M.A. Thesis.

Thanking you in advance for your cooperation

Yours sincerely,



**Dr. Daniel M. Kitonga (Ph.D.)**  
Director, Research & Postgraduate Studies

CC:

Dr. Aloys O. Ojore – Programme Leader, M. A. in Social Transformation (IST)

**Appendix L: Authorisation from Central Africa Republic (English)**

RÉPUBLIQUE CENTRAFRICAINE



Unité Dignité Travail

Monday 9th of october 2023

Préfecture of Sangha-Mbaéré,

Office of the Sous-Préfecture of Nola 2

Ref : 870 *CM*

**AUTHORISATION TO CONDUCT YOUR RESEARCH AMONG THE BAYAKA**

Dear Fr. Anselme,

In response to your demand for research permit on a study entitled “the contribution of land tenure systems to food security among the Bayaka of Belemboke I and Belemboke IV, Nola, Central African Republic” You are allowed to conduct your research within the respect of ethical norms stipulated in your proposal.

We wish you a fruitful research and look forward to its contribution to the sustainable development of our locality.

Yours sincerely,

Mme. CHOUR Genevieve Gbadin

Sous-prefect of Nola 2 (in charge of population and health)

## Appendix M: Authorisation from Central Africa Republic (French)

RÉPUBLIQUE CENTRAFRICAINE



Unité Dignité Travail

Lundi 9 octobre 2023

Préfecture de Sangha-Mbaéré,  
Bureau de la Sous-Préfecture de Nola 2

Réf : 870 *CA*

### AUTORISATION DE MENER VOS RECHERCHES PARMIS LES BAYAKA

Cher P. Anselme,

En réponse à votre demande de permis de recherche sur une étude intitulée « La contribution des Régimes fonciers à la sécurité alimentaire parmi les Bayaka de Belemboke I et Belemboke IV, NOLA, République Centrafricaine », vous êtes autorisé à mener votre recherche dans le respect des règles d'éthique stipulés dans votre proposition.

Nous vous souhaitons une recherche fructueuse et nous nous réjouissons de sa contribution au développement durable de notre localité.

Cordialement,

Mme. CHOUE Geneviève Gbadin

Sous-préfet de NOLA 2 (chargée de la population et de la santé)

# Appendix N: Turnitin Originality Report

## Turnitin Originality Report

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**CONTRIBUTION OF LAND TENURE SYSTEMS TO FOOD SECURITY AMONG THE BAYAKA OF BELEMBOKO I AND BELEMBOKO IV IN NOLA, CENTRAL-AFRICAN REPUBLIC** By Yonionfour Ishola Anselme

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 Catholic University of Eastern Africa,  
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