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MASTER OF ARCHITECTURE

A REVIEW OF THE HOUSING RESETTLEMENT OF THE MAASAI FROM
NGORONGORO TO MSOMERA-HANDENI -TANGA.

SUBMITTED

BY

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ABSTRACT

This research reviewed the process of housing provisions during the resettlement of the Maasai from Ngorongoro to Msomera-Tanga. Despite housing being crucial for human sustainability, it poses significant challenges for the Maasai community in Tanzania during the resettlement from one area to another. Current housing policies and programs fail to effectively address the socio-cultural aspects of sustainability and often overlook the community's unique needs. These initiatives focus on the quantity of housing units delivered rather than the broader system, neglecting the socio-cultural aspirations of beneficiaries and resulting in cultural disconnection and social fragmentation.

The research adopted a mixed-methods approach, incorporating in-depth interviews, participatory observation, focus group discussions, site surveys, and document reviews to explore housing challenges. It also utilized ArcGIS Pro software to analyse land use patterns from 2013 to 2023, identifying changes in vegetation, water features, and bare land that may impact the pastoral lifestyle.

While many studies have explored housing delivery challenges based on specific community needs, these challenges differ significantly across contexts. This research aimed to address this gap by providing an overview of housing provisions and the obstacles to sustainable housing in Msomera-Tanga.

Findings indicate that despite the concerted efforts provided by the government and Maasai adaptation to new environment, the relocation still pose challenges in terms of their cultural values which results in disruption of cultural identity. This research holds practical significance for policymakers, implementers, and researchers focused on achieving successful and sustainable resettlement out-comes. The research recommends the use of participatory design approach as it actively involves the Maasai community in the design process, ensuring that housing solutions reflect their voices, cultural values, and specific needs, ultimately enhancing their well-being and cultural identity.

DECLARATION

I, Moses Longututi Kivuyo, declare that the information and findings presented in this dissertation report are the outcome of my independent research. I confirm that this work has not been submitted for any academic qualification or recognition in any educational institution.

I further declare that the material obtained from other sources has been duly acknowledged in this study.



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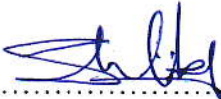
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DEDICATION

I express my heartfelt gratitude as I dedicate this dissertation to my parents, whose constant support has been a source of unwavering strength during my educational voyage. To my diligent supervisor and course coordinator, your invaluable guidance and profound insights have greatly influenced the path of this research. I am also indebted to my family, friends, and all those who have contributed to the triumph of this endeavor, each playing an exceptional and irreplaceable role in its completion.

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TABLE OF CONTENT

ABSTRACT	i
DECLARATION	ii
DEDICATION	iv
ACKNOWLEDGEMENT	v
TABLE OF CONTENT	vii
LIST OF FIGURES.....	xv
LIST OF TABLES	xx
LIST OF GRAPHS.....	xxi
ABBREVIATIONS AND ACRONYMS	xxii
CHAPTER ONE	1
1. INTRODUCTION.....	1
1.1 Background.....	1
1.1.1 Historical Resettlement Trends in Tanzania	3
1.1.2 Maasai Tribe in Tanzania.....	6
1.1.3 Current Debate on Maasai Resettlement from Ngorongoro to Msomera- Tanga	9
1.1.4 Why Maasai hesitancy to depart from the NCA?	12
1.2 Problem Statement.....	13
1.3 Research Objectives	14
1.3.1 General objective.....	14
1.3.2 Specific Objective	14
1.3.3 Research Questions.	14
1.4 Significance of the Study.....	14
1.5 Justification of the research	15
1.6 Conceptual framework	16
1.6.1 The User-Centered Design (UCD) concept	16

1.7	Scope of the Study	18
1.7.1	Content scope	18
1.7.2	Geographical scope	18
1.7.3	The time Scope	18
CHAPTER TWO.....		20
2.	Literature Review	20
2.1	Introduction	20
2.2	Community Resettlement	20
2.2.1	The Concept of Resettlements and their processes	20
2.2.2	Theoretical Resettlement trends	23
2.2.3	Resettlement trend from Protected Areas (Pas)	24
2.2.4	Factors influencing the resettlement process	24
2.3	The traditional Housing	25
2.3.1	The concept of Traditional Housing.....	25
2.3.2	Traditional Architectural Design values	27
2.3.3	Influence of Culture on Housing.....	28
2.3.4	Traditional Housing Design	28
2.3.5	Factors influencing Traditional Housing Architectural Design	29
2.4	Resettlement/relocation Policy and Legislative Background in Tanzania	33
2.4.1	National Tourism Policy 1999	33
2.4.2	World Bank Involuntary Resettlement Policy (OP 4.12).....	33
2.4.3	Graves (Removal) Act No. 9 of 1969	33
2.4.4	Ministry of Natural Resources and Tourism (2017)	34
2.5	Ngorongoro Conservation Area (NCA)	34
2.5.1	NCA Area as a protected area	34
2.5.2	Unique features/ Elements in Ngorongoro Conservation Area.....	35

2.5.3	Land use Practices in Ngorongoro Conservation area (NCA)	39
2.5.4	Tourism in Ngorongoro Conservation area.....	44
2.6	The Maasai	46
2.6.1	Maasai Historical Background	46
2.6.2	Maasai Culture, Custom and Traditions.....	47
2.6.3	Architecture of Maasai Tribe in NCA.....	54
2.7	Summary of Key Findings of Literature.....	59
CHAPTER THREE.....		60
3.	Research Methodology.....	60
3.1	Introduction	60
3.2	Pre-Field Work	60
3.3	Field Work.....	61
3.4	Research Design	62
3.5	Research Approaches	63
3.5.1	Qualitative research method.....	63
3.5.2	Quantitative research method.....	64
3.6	Description of the Research area	65
3.6.1	Ngorongoro Conservation area	65
3.6.2	Msomera -Handeni Tanga.....	67
3.6.3	Mitigation Measures for Climate Differences between Ngorongoro and Msomera	69
3.7	Population Description	70
3.8	Sample size selection.....	70
3.9	Sampling techniques and procedures	72
3.10	Data collection methods.....	73
3.11	Data collection instruments/tools.....	73
3.11.1	In-depth Interview Guide.....	74

3.11.2	Focus Group Discussion Guide	74
3.11.3	Observation.....	74
3.11.4	Physical Site Survey	75
3.11.5	Remote Sensing (RS) Satellite Imagery	75
3.11.6	Aeronautical Reconnaissance Coverage Geographic Information System pro (ArcGIS Pro)	75
3.12	Research Variables.....	76
3.13	Data quality control.....	81
3.13.1	Reliability and validity of instruments	81
3.14	Data analysis Techniques.....	82
3.14.1	Analysis of respondents' narratives	82
3.14.2	ArcGIS Pro software	82
3.15	Limitations / Anticipated Problems	83
3.15.1	Language and cultural barriers	83
3.15.2	Political and social sensitivities.....	83
CHAPTER FOUR.....		84
4.	Presentation of Findings.....	84
4.1	Introduction	84
4.2	Traditional Architectural Values of Maasai Housing.....	84
4.2.1	The Architecture of Maasai Housing at NCA	84
4.2.2	Architecture of Maasai Housing at Msomera	96
4.2.3	Comparing Qualities of Maasai Housing at Ngorongoro and Msomera Tanga 113	
4.2.4	Major Architectural challenges identified in the study resettlement.....	118
4.2.5	Summary of Maasai Traditional cultural values	120
4.3	Influence of Traditional Maasai cultural values on Housing architecture.....	122
4.3.1	The hearth “Orupie”	122

4.3.2	The Privacy in Maasai.....	123
4.3.3	Maasai practice on polygamy structure.....	125
4.3.4	Livestock enclosure as a focal point of design.....	126
4.3.5	The significance of courtyard.....	126
4.3.6	Security.....	127
4.3.7	Orientation of Maasai homestead “boma”	129
4.3.8	Maasai Housing style and form.....	130
4.3.9	Use of local building materials.....	130
4.3.10	The Maasai patriarchal structure	131
4.3.11	Adaptation to new environment	131
4.3.12	Maasai coexistence with wildlife	131
4.3.13	Spiritual connection to landscape.....	132
4.3.14	Ethnomedical sites.....	132
4.3.15	Maasai pastoralism life style	133
4.3.16	Maasai Communal land ownership	133
4.3.17	How communal land alterations influenced Maasai Architecture.....	134
4.4	Design approaches of Modern Housing in Msomera-Tanga.....	141
4.4.1	Overview of Maasai relocation process from Ngorongoro to Msomera.....	143
4.5	Integration of Traditional Maasai Traditional Architectural values in future housing projects in Tanzania	144
4.5.1	Integration of hearth “Orupie” sustainable practice.....	145
a)	<i>The use biogas.....</i>	145
b)	<i>The use of improved cook stove (ICS) inside the building.....</i>	145
c)	<i>Creating designated outdoor cooking areas.....</i>	145
4.5.2	Maasai housing spatial requirements	145
4.5.3	Homestead organization to enhance cultural identity	146
4.5.4	Orientation of Maasai homestead “boma”	146

4.5.5	The design of building form and shape that reflect Maasai identity	146
4.5.6	Maasai Adaptation to new environment should involve a participatory approach 146	
4.5.7	The use of materials and construction techniques.....	146
4.5.8	Implementing effective grazing land management	147
4.5.9	Conservation of Medicinal Plants at relocated zones.....	147
CHAPTER FIVE.....		148
5.	Discussion of Findings	148
5.1	Introduction	148
5.2	Traditional Architectural values of Maasai Housing.....	148
5.3	Influence of Traditional Maasai Cultural values on Housing Architecture.....	148
5.3.1	<i>Th use of hearth “orupie”</i>	148
5.3.2	<i>Privacy in Maasai</i>	149
5.3.3	<i>Maasai practice on polygamy structure</i>	149
5.3.4	<i>Maasai perception on the use of Toilets</i>	150
5.3.5	<i>Livestock enclosure as a focal point of design</i>	150
5.3.6	<i>The significance of courtyard</i>	151
5.3.7	<i>Security</i>	151
5.3.8	<i>Orientation of Maasai homestead “boma”</i>	151
5.3.9	<i>Maasai Housing style and form</i>	151
5.3.10	<i>Use of local building materials</i>	152
5.3.11	<i>Maasai Patriarchal structure</i>	152
5.3.12	<i>Maasai Adaptation to new environment</i>	153
5.3.13	<i>Maasai coexistence with wildlife</i>	153
5.3.14	<i>Spiritual connection to landscape</i>	154
5.3.15	<i>Ethnomedical sites</i>	154
5.3.16	<i>Maasai pastoralism life style</i>	155

5.3.17	<i>How communal land alterations influenced Maasai Architecture</i>	155
5.3.18	Limited Grazing Land	155
5.3.19	Risk of Overgrazing.....	156
5.3.20	Water Scarcity	156
5.3.21	Climatic conditions and their impact on Maasai housing comfort and adaptation 157	
5.3.22	. Expected consequences in future.....	158
5.4	Design approaches of Modern Housing in Msomera.	158
5.4.1	The concept Participatory Design Approach	159
5.4.2	Lack of participatory design at Msomera.....	159
5.5	Integration of Traditional Maasai Traditional Architectural values in future housing projects in Tanzania	161
5.5.1	<i>Integrating a traditional Hearth in a sustainable way.....</i>	161
5.5.2	<i>To adhere with the spatial qualities of Maasai homestead.....</i>	165
5.5.3	<i>Homestead organization to enhance cultural identity</i>	167
5.5.4	<i>Orienting homestead “boma” according to Maasai tradition.....</i>	168
5.5.5	<i>The design of building form and shape that reflect Maasai identity.....</i>	169
5.5.6	<i>Maasai Adaptation to new environment should be participatory</i>	171
5.5.7	<i>The use of local building materials to reflect their cultural identity</i>	171
5.5.8	<i>Decentralized zoning based on user needs and land-use compatibility.....</i>	175
5.5.9	<i>Implementing effective glazing land management</i>	176
5.5.10	<i>Conservation of Medicinal Plants at relocated zones</i>	177
5.5.11	. Expected consequences in future for ongoing relocation projects	177
5.5.12	Planning solutions to minimize conflicts between resettled communities and original inhabitants.....	178
5.5.13	. Summary of Discussion of findings	178
CHAPTER SIX		180

6.	Conclusion and Recommendations	180
6.1	Introduction	180
6.2	An overview of the study.....	180
6.3	Key findings of the study.....	180
6.4	Major Research Output.....	182
6.5	Conclusions	182
6.6	Recommendations	186
6.6.1	General recommendation	186
6.6.2	Specific recommendation.....	186
6.7	Areas for Further study/Investigation.....	188
	REFERENCES.....	190
	APPENDICES.....	209

LIST OF FIGURES

Figure 1-1: Maasai men dressed in Traditional clothing, shukas –Source (Antonsen 2019).....	7
Figure 1-2: Maasai women dressed in shukas and beaded handcrafts-Source (Antonsen 2019)	7
Figure 1-3: Maasai cultural boma housing layout-Source (Ayubu and Cleempoel 2020).....	8
Figure 1-4:The Maasai people's current residence in NCA and resettlement zone at Msomera-Tanga-Source (Author 2024)	10
Figure 1-5: Panoramic view of Maasai homestead at Msomera-Handeni Tanga	11
Figure 1-6: The Maasai new housing style at Msomera -Tanga-Source (Mbise 2022).	11
Figure 1-7: User-centered design process- Source Abbakyari et al.2023).....	16
Figure 1-8: The study areas of Ngorongoro and Msomera-Tanga-Source (Author 2024)	19
Figure 2-1: The traditional Malay house reflects the beliefs, morals and ideologies of society, rooted in a rich cultural legacy-Source (Hosseini et al. 2012).	25
Figure 2-2: Traditional houses reflect a clear architectural heritage formed through the cooperation of users, builders and artifacts over generations-Source (Hosseini et al. 2012)...	26
Figure 2-3:Orientation of Singengu village settlement-Source (Nuraini, Djunaedi, Sudaryono, and Subroto, 2014).	31
Figure 2-4: 2a, 2b, 2c, 2d: Diverse Landscape at Ngorongoro	36
Figure 2-5: Herd of animals in Ngorongoro crater -Source (Johanne and Aure 2019).	37
Figure 2-6: The Ngorongoro Crater as seen from Ngorongoro Wildlife Lodge -Source (Johanne and Aure 2019).	38
Figure 2-7: Current Maasai land use in NCA (Source-Oleshangai 2022).	40
Figure 2-8:Location of Oldonyo Lengai-Source (Author 2024).....	41
Figure 2-9: Oldonyo Lengai Mountain of God, Ngorongoro District.....	42
Figure 2-10:Magic shifting sand -Source (Mwankunda 2020).	43

Figure 2-11: Reconciliation Practices at the Magic Shifting Sand Dunes of Ngorongoro-(Mwankunda 2020).	43
Figure 2-12: Maasai dancing to attract tourism -Source:(Sharp and Twati 2017.	45
Figure 2-13: Maasai woman showing a tourist the beaded handicrafts –	46
Figure 2-14: Milk cows in Maasai Knaal -Source (Sharp and Twati 2017).	49
Figure 2-15: Maasai Women and Warrior wearing Maasai decorative clothes	51
Figure 2-16:Maasai beadwork decorated with variety of colors and patterns-	51
Figure 2-17: Significance of colors in Maasai Culture-Source (Albert et el 2020 and Myung 2023).....	52
Figure 2-18:Maasai boys are preparing for circumcision ceremony and after circumcision-Source (Katowicz 2013; Quinlan et al. 2016)	53
Figure 2-19:A typical Maasai clan- dwelling compound showing house units-.....	55
Figure 2-20: Maasai cultural boma at Ngorongoro -Source (Mbise 2022).....	57
Figure 2-21: Maasai housing style and form-Source (Mewanu and Nyeko 2024).	57
Figure 2-22:Maasai cow dung and round thatch house-Source (Ayubu and Cleepoel 2020)..	58
Figure 3-1: Field work at NCA Source: (Author 2024)	61
Figure 3-2: Field work at Msomera- Tanga-Source: (Author, 2024).....	62
Figure 3-3: Location of Ngorongoro Conservation Area-Source: (Author 2024)	66
Figure 3-4: Location of Ngorongoro DC and Wards-Source (Author 2024).....	67
Figure 3-5:Location of Tanga region-source (Author 2024)	68
Figure 3-6:Location of Misima Ward where Msomera is situated-Source (Author 2024).....	69
Figure 4-1: Maasai Land use at NCA-Source (Author, 2024)-.....	85
Figure 4-2: Integrated landscape for livestock pastoralism and wildlife (Source: Author 2024)	87
Figure 4-3: Seasonal camp "ronjo" (Source: Author 2024)	88

Figure 4-4: Maasai Homestead layout and orientation-Source (Author 2024).....	90
Figure 4-5: A and B are Maasai Homestead layout typology 1 and 2-Source (Author 2024). 90	
Figure 4-6: Maasai homestead organization (Source; Author 2024)	92
Figure 4-7: Maasai Homestead organization pattern at NCA (Source: Author 2024).....	92
Figure 4-8: Typical Maasai Round thatch house (Source: Author 2024)	94
Figure 4-9: Typical Maasai cow dung house (Source: Author 2024)	94
Figure 4-10: Typical Maasai Fathers house (Source: Author 2024)	95
Figure 4-11: Typical Maasai father's thatch house (Source: Author 2024).....	95
Figure 4-12: Maasai homestead construction Materials (Source: Author 2024)	96
Figure 4-13: Maasai glazing land at Msomera (Source: Author 2024).....	97
Figure 4-14: Artificial water points and Dip tanks for livestock dehydration and healthcare at Msomera (Source: Author 2024).....	97
Figure 4-15: Seasonal camps "ronjo" at Msomera (Author: 2024).....	98
Figure 4-16: Ndorobo mountain at Msomera (Source: Author 2024)	99
Figure 4-17: Examples housing organization pattern at Msomera (Source: Author, 2024) ..	100
Figure 4-18: House Typology-1 at Msomera (Source: Author, 2024).....	101
Figure 4-19: Housing Typology 2 at Msomera-Source: (Author 2024)	102
Figure 4-20: Adaptation and incremental of spaces-Household-1 (Source: Author 2024)....	105
Figure 4-21: Adaptation and incremental of spaces-Household-2 (Source: Author 2024)....	107
Figure 4-22: Adaptation and Incremental of spaces(Source: Author 2024).....	108
Figure 4-23: Adaptation and incremental of spaces-Household 4 (Source: Author 2024)....	109
Figure 4-24: Adaptation and incremental of spaces-Household 5 (Source: Author 2024)....	110
Figure 4-25: Adaptation and incremental of spaces-Household 6 (Source: Author 2024)....	111
Figure 4-26: Adaptation and incremental of spaces-Household 7 (Source: Author 2024)....	112

Figure 4-27:Climate: Weather data of Ngorongoro (Source: Mwabumba et all. (2022).....	120
Figure 4-28:Climate data of Msomera-Tanga (Source: Mwakalonge 2023)	120
Figure 4-29a: Maasai hearth "Orupie"at Ngorongoro-Source (Sharp and Twati 2017)	123
Figure 4-30b: Maasai hearth “orupie” floor plan at Ngorongoro-Source (Author 2024)	123
Figure 4-31:Location of Herth "Orupie" at Msomera-Source:(Author 2024)	123
Figure 4-32:Homestead layout at Ngorongoro and Msomera Handeni Tanga-Source (Author 2024).....	125
Figure 4-33:Courtyard at Maasai cultural boma at Ngorongoro-Source (Author 2024)	127
Figure 4-34: Main entrances at Ngorongoro and Msomera-Source (Author 2024).....	128
Figure 4-35:Poor security for one of the household at Msomera(Source: Author 2024)	129
Figure 4-36: Ngorongoro land use pattern of 2013, 2015, 2018, 2020 and 2023 respectively	137
Figure 4-37: Msomela land use pattern of 2013, 2015, 2018, 2020 and 2023 respectively ..	139
Figure 5-1: Msomela new allocated area for grazing (Source: Author 2024)	156
Figure 5-2: Msomela artificial pond and water point (Source: Author 2024)	157
5-3: Improved Traditional Maasai Hearth (Source: Author 2024)	163
5-4: Details for improved Maasai hearth.....	164
Figure 5-5:Maasai main house housing layout (Source: Author 2024)	165
Figure 5-6:Father's house (Author 2024)	166
Figure 5-7:Proposed Homestead organization for future resettlement projects (Author 2024)	167
Figure 5-8: Proposed Homestead organization for future resettlement projects (Source:Author 20204).....	168
Figure 5-9:Proposed form and shape of Maasai housing (Source: Author 2025).....	170
5-10:External wall finishing materials (Source: Author 2024).....	172

5-11: Internal Wall and floor finishing materials (Author 2024).....	172
5-12:Proposed Roofing materials at Msomera (Author, 2024).....	173
5-13:Roofing materials and construction Techniques (Author 2024).....	173
5-14:Contextual zoning at Msomera (Source: Author 2024).....	175

LIST OF TABLES

Table 3-1: Sample size selection	71
Table 3-2: Research variables, research objectives, methods and tools that will be employed to answer the research questions	76
Table 4-1: Comparison of Qualities Between Maasai Homesteads at Ngorongoro and Msomera Tanga	113
Table 4-2: Summary of Maasai Traditional cultural values	121

LIST OF GRAPHS

Graph 4-1: Ngorongoro Land use Dynamic graph.....	140
Graph 4-2: Msomera Land use Dynamic graph	141

ABBREVIATIONS AND ACRONYMS

Arc GIS	: Geographical Information System software
AWF	: African Wildlife Foundation
DTP	: Development Plan
ERP	: Ecological Relocation Programs
FGD	: Focus Group Discussion
GCA	: Games Controlled Areas
GRA	: Game Reserve Areas
HWC	: Human –Wildlife Conflict
ICS	: Improved Cook Stove
IUCN	: International Union for Conservation of Nature.
MoEST	: Ministry of Education, Science, and Technology
NCA	: Ngorongoro Conservation Area
NCAA	: Ngorongoro Conservation Area Authority
PAs	: Protected areas
RC	: Regional Commissioner
RPF	: Resettlement Policy Framework
SDGs	: Sustainable Development Goals
UCD	: User Centered Design
UN	: United Nations.
UNDRR	: United Nations Office for Disaster Risk Reduction
UNESCO	: United Nations Educational, Scientific and Cultural Organization.

CHAPTER ONE

1. INTRODUCTION

1.1 Background

The resettlement of people due to development projects has become a common phenomenon, resulting in more than 15 million people being resettled annually on a global scale (Xu, Xu, and Pittock 2023). Resettlement entails relocating individuals from their current place to a new one, providing them with improved living conditions and essential services (Walelign and Lujala 2022). This intersects with the 11th agenda of the Sustainable Development Goals (SDGs), reflecting the urgency of creating and maintaining livable human settlements globally, with rapid urbanization being a key factor driving this importance. In line with this study, Target 11.4 aims to strengthen efforts to protect and safeguard the world's cultural and natural heritage, emphasizing the importance of preserving and conserving these areas (Astuti et al. 2023; Opoku 2016a).

A large number of resettlement cases comes from development projects like construction of dams and mining, and processes of urbanization) leading to far larger numbers. One estimate based on numerous studies, is 60 million (Mathur 2008). The need for resettlement is an enduring facet of human life, triggered by natural disasters, conflicts, and the expanding influence of human activities such as mining and extractive industries, conservation of nature, mirroring the impact of man-made disasters (Terminski 2013; Zaman, Nair, and Guoqing 2021).

When land is needed for purposes such as infrastructure development like constructing dams or roads people and communities are often resettled (Asiama, Lengoiboni, and van der Molen 2017; Bryan Tilt, Drew Gerkey 2016). Furthermore, land is required for extensive extraction of natural resources (Owen et al. 2024; Usman and Balsalobre-Lorente 2022) and for conservation efforts, which include establishing nature reserves and ecological restoration (Aguirre-Salado et al. 2017; Karanth, Kudalkar, and Jain 2018). As a core of this study Resettling local communities from protected areas (PAs) is often seen as a viable approach to reduce human disturbances and environmental pressures. However, insufficient understanding of these communities' perceptions regarding resettlement can lead to unsuccessful relocation efforts, negatively affecting both environmental sustainability and local livelihoods. More than

70% of the world's Protected Areas (PAs) are inhabited by human populations (Peng et al. 2020). The increasing anthropogenic pressures have become a pressing concern in achieving the established goals of PAs to safeguard against ecological deterioration and to maintain biodiversity (Loos 2021; Mitchell et al. 2018). The decision to relocate communities should be based on careful assessment of the risks and benefits, considering the social, economic, and cultural impacts on the affected communities.

Shifting homes presents individuals with the challenging task of shifting both their physical residence and their mindset, offering a blend of difficulties and possibilities in the process of resettlement (Abid et al. 2023). These impacts include changes in livelihoods and impoverishment, cultural and social values, natural environment, norms and life style (Astuti et al. 2023; Siriwardhana et al. 2021). The absence of culturally significant ritual spaces in a resettled village is a potential factor contributing to its lack of success, emphasizing the need to consider socio-cultural context in determining residential satisfaction residents (Shrestha, Uprety, and Pokharel 2023). Danquah, Attippoe and Ankrah (2014) highlight that spaces, places, and buildings hold significant meaning beyond their physical presence; they are intertwined with personal histories, relationships, and shared experiences within families, communities, and cultures.

Addressing these cultural issues and taking proper consideration of cultural factors is crucial for achieving successful outcomes in community perspective within resettlement projects. In most resettlement projects, migrants are likely to feel happier if they are satisfied with the housing resettlement allocation mode, housing resettlement quality, and the living space, as argued by (Li and Feng 2021). The resettlement housing often fails to consider the unique needs, norms, culture, and way of life of relocated individuals, leading them to adapt their living spaces incrementally to cope with their new environment and restore their livelihoods (Eerd 2023).

The issue of resettlement in African countries has been a complex and multifaceted one (Tefera 2009), influenced by factors such as historical colonialism, indigenous rights, demographic changes, and the impact of international organizations like the United Nations. The issue has often been contentious, involving debates over cultural practices, traditional dress, and the impact of relocation on indigenous peoples and their rights (Kingston 2015). Throughout history, it has been noted that as cultural values evolve, so do the settlements of individuals.

Societies experiencing rapid and significant transitions serve as valuable opportunities to examine this phenomenon. The Maasai people are a prime example of such a group, as a casual observation would reveal their remarkable transformation within a relatively brief timeframe (Rukwaro and Mukono 2001).

In a study conducted in Kigali Rwanda, Nikuze et al (2019), examined the socio-spatial changes resulting from urban redevelopment and disaster-induced resettlement projects in informal settlements. The study emphasizes the detrimental impact of these activities on the livelihoods of the affected households, advocating for improved information, guidelines, and compensation to mitigate the risks of impoverishment. It highlights the interconnected factors leading to impoverishment, such as loss of livelihood resources, landlessness, homelessness, unemployment, reduced access to common property resources, marginalization, food insecurity, health issues, increased mortality, social disintegration, and uncertainty (Nikuze et al. 2019). This aligns with the principles outlined in the United Nations Declaration on the Rights of Indigenous Peoples, which emphasizes the rights of indigenous peoples to their lands, territories, and resources, as well as their right to maintain and strengthen their distinct cultural, spiritual, and social identities (Juma 2013).

Resettlement programs, their process, and the need for careful planning are crucial in addressing the issue and improving living conditions, with potential significant impacts on affected communities (Gai, Wahome, and Bett 2022). Resettlement schemes have to be planned. Without adequate measures such as equitable compensation, relocation support, and sustainable livelihood initiatives, individuals and communities can become vulnerable to the negative impacts of these interventions (Astuti and Rahayu 2023; Nikuze et al. 2019).

1.1.1 Historical Resettlement Trends in Tanzania

Like any other countries, Tanzania has experienced various developments and challenges related to community resettlement. These developments, resulting from factors such as an increasing population, loss of cattle due to disease, competition from other tribes, and the establishment of park boundaries, have had social, economic, and environmental impacts on the affected communities (Akbulut 2010; Gai et al. 2022; Mbise 2022). Despite the fact that Tanzania is home to multiple tribes (Kannowski & Ngaiza 2022; Malipula 2014), the Maasai tribe has been at the forefront of cases involving relocation caused by development projects due

to their close proximity to protected areas and the challenges they face in sustaining their traditional way of life.

In 1959, a population of 3000 Maasai people were relocated to Ngorongoro Conservation area (NCA) from the Serengeti plains by Colonial rule and the area was gazetted as a National Park (Kideghesho et al. 2005). The relocation was aimed at protecting the wildlife and their habitats, as protected areas like Serengeti which is crucial for conservation efforts. The relocation has caused a profound disruption in their social and cultural fabric, resulting in the fragmentation of their traditional way of life, a loss of cultural identity, a sense of displacement, and a significant impact on their livelihoods (Sirima and Backman 2013). That was reallocation without provision for housing.

In 1975 Maasai were relocated from Ngorongoro Crater. The relocation had a detrimental impact on their socioeconomic and cultural well-being, disrupting their traditional land use practices and leading to significant livestock losses due to the disturbance of the intertwined cultural landscape and seasonal dynamics (Oleshangai; 2022). This was also the reallocation without provision of housing.

In 1988, the Tanzanian government resettled hundreds of Maasai Pastoralists in order to establish the Mkomazi Game Reserve. The pastoralists were moved from their original reserve to a new area in Handeni district, Tanga region by the government. This relocation reported to have impacts in terms of the socio-economic-cultural consequences to the pastoralists. This was also reallocation without provision of housing (Oleshangai; 2022; Wickama, Ngailo, and Mlingano 2005).

Between October 2006 and May 2007, a large number of pastoralists were resettled from the Usangu Ihefu wetlands and relocated to Kilwa and Lindi Rural District in Lindi Region for the purpose of environmental protection (Oleshangai; 2022; Sirima and Backman 2013). This relocation resulted in a significant decline in their livestock, leading them to perceive it as a deliberate attempt to destroy their animals, livelihood, and culture. That was reallocation without provision for housing.

Between 2007 and 2010, the NCAA relocated 159 families to Jema Village in Ngorongoro district, where the government provided infrastructure for social services. However, over 50% of these residents later returned to the NCA or relocated elsewhere, indicating that the resettlement efforts were largely unsuccessful. In 2009, the 50 to 70 families still at the

resettlement site encountered opposition from local communities and were also considering leaving the area.

In 2022 Tanzania Government intended to relocate the Maasai Tribe to Msomera- Handeni Tanga in order to enhance the conservation and protection of wildlife and their habitats in Ngorongoro (Mbise 2022). The relocation is about 600km eastern of Ngorongoro (Juliana Nnoko-Mewanu and Oryem Nyeko 2024). That was reallocation with provision of housing and other important social services. Despite lacking government authorization, certain residents of the Ngorongoro Conservation Area decided to remain there due to their concerns about losing their livelihoods and cultural identity (Oleshangai; 2022). This current reallocation is in debate and controversy, but few studies have attempted to shed light on the impacts of this resettlement as it had social, economic, and environmental impacts on the affected communities (Kannowski & Ngaiza 2022).

However, the scheme has sparked debates about its impact on human rights and local livelihoods, it is important to consider the complex dynamics between conservation goals and the well-being of local communities when implementing such resettlement initiative (Mbise 2022, Oleshangai; 2022).

The case of the year 2022 presents a unique opportunity to study the impact of housing provision on the well-being of the relocated community, analyze the potential outcomes of the relocation in cultural perspective, address the knowledge gap in understanding the cultural issues related to resettlement, and examine the dynamics between government intentions and community responses in the context of resettlement efforts.

This study aligns with the Tanzania Development Vision 2025, which focuses on improving quality of life through sustainable settlements, poverty reduction, and environmental conservation. It supports national efforts to promote sustainable development, balanced resource use, and improved living conditions while preserving the country's natural and cultural heritage. It supports the National Housing Policy of 2000, which emphasizes the provision of adequate, affordable, durable, and culturally appropriate housing that ensures health, safety, and legal security. This makes it a compelling case for in-depth analysis of the intended gap of the study of Maasai resettlement from Ngorongoro to Msomera -Tanga.

1.1.2 Maasai Tribe in Tanzania

Maasai tribe are among of more than one hundred and twenty (120) tribes found in Tanzania which are scattered in its vast geographical context (Bernd Kannowski & Cecilia Ngaiza 2022; Mtuy et al. 2022). The complex intersection of these tribal communities can be distinguished through their religion, food, what they wear, how they wear, language, marriage, music and is different all over the world as well as settlements patterns and their unique architectural styles (Malipula 2014). The Maasai tribe, known for their unique cultural identity, has long been an integral part of the northern Tanzania (Mtuy et al. 2022). The Masai people have long-standing traditions and spiritual beliefs that place family and tribe at the center of people's lives (Sharif and Bugo 2015).

They live in traditional houses known as “Enkang”. They are a nomadic tribe in East Africa and have successfully preserved their unique cultural practices amidst the influence of western culture, formal education, and civilization, making them an emblem of African heritage and a testament to the resilience of nomadic communities (Albert and Mosha 2020). Their livelihood, lifestyle, and identity are inseparable from their livestock, which provide them with both sustenance and financial stability. However, due to various factors such as population growth, loss of cattle, and competition for resources, the Maasai have had to adapt and find new ways of sustaining themselves. Their traditional housing culture, clothing styles, and strategically located territories adjacent to the game parks in Tanzania and Kenya have made them among the most recognized tourist attractions in East Africa (Sharp and Twati 2017).



Figure 1-1: Maasai men dressed in Traditional clothing, shukas –Source (Antonsen 2019)



Figure 1-2: Maasai women dressed in shukas and beaded handcrafts-Source (Antonsen 2019)



Figure 1-3: Maasai cultural boma housing layout-Source (Ayubu and Cleempoel 2020).

1.1.3 Current Debate on Maasai Resettlement from Ngorongoro to Msomera-Tanga

In the year 2022, the Government of the United Republic of Tanzania through Ministry of Natural Resources and Tourism took initiative to upgrade fourteen (14) Games Controlled Areas (GCA) to Game Reserve Areas (GRA). Ngorongoro Conservation Area (NCA) which is the ancestral land for the Maasai for a long time had become one of the upgraded areas. This strategy went hand in hand with the move to relocate the Maasai Tribe to Handeni Tanga in order to enhance the conservation and protection of wildlife and their habitats in Ngorongoro (Mbise 2022). The government demarcated land of 400,000 acres in Msomera village in Handeni district where residential houses were to be constructed for the voluntarily relocating Maasai residents of NCA (Oleshangai, 2022 p.32).

The voluntary relocation of the Maasai people from Ngorongoro to Msomera Tanga brought significant challenges and controversies, sparking debates on the potential social, economic, and environmental impacts on the resettled communities. The community had major concerns about the potential loss of livelihood and the threat to their cultural identity, which they fear may be compromised due to relocation to Msomera. Economically, they were apprehensive about the challenges of integrating into new economic systems and the impacts this relocation may have on local economies. Environmentally, the Maasai worry about the availability of sustainable resources, such as adequate grazing land and water, necessary to support their livestock (Oleshangai; 2022).

The plan to relocate the Maasai from the NCA was a long-term discussion according to some studies that were done. However, the Maasai have consistently resisted relocation for several decades, highlighting their determination to remain in their ancestral lands. The study conducted by (Bellini 2008) showed that The NCAA claims that it has sound conservation reasons for wanting the Maasai out of Ngorongoro. One of its arguments is based on research conducted by the University of California, which used computer simulation modeling to study the interactions between livestock and wildlife in the area. The study suggests that the wildlife, ecosystems, and tourist industry in Ngorongoro can only be preserved if the Maasai give up their pastoral way of life and either move out of the area or find alternative sources of income.

The Maasai population in the NCA is approximately 120,000 people with around 45,200 livestock. This growth in people and livestock puts pressure on the landscape.

To alleviate this pressure, the Tanzanian government's initiative is to relocate willing Maasai from the NCA to another district, in this case the Handeni district in Tanga region. The relocation of Maasai community from Ngorongoro to Msomera Village in Handeni Tanga has involved provision of housing and other important social services (Mbise 2022).

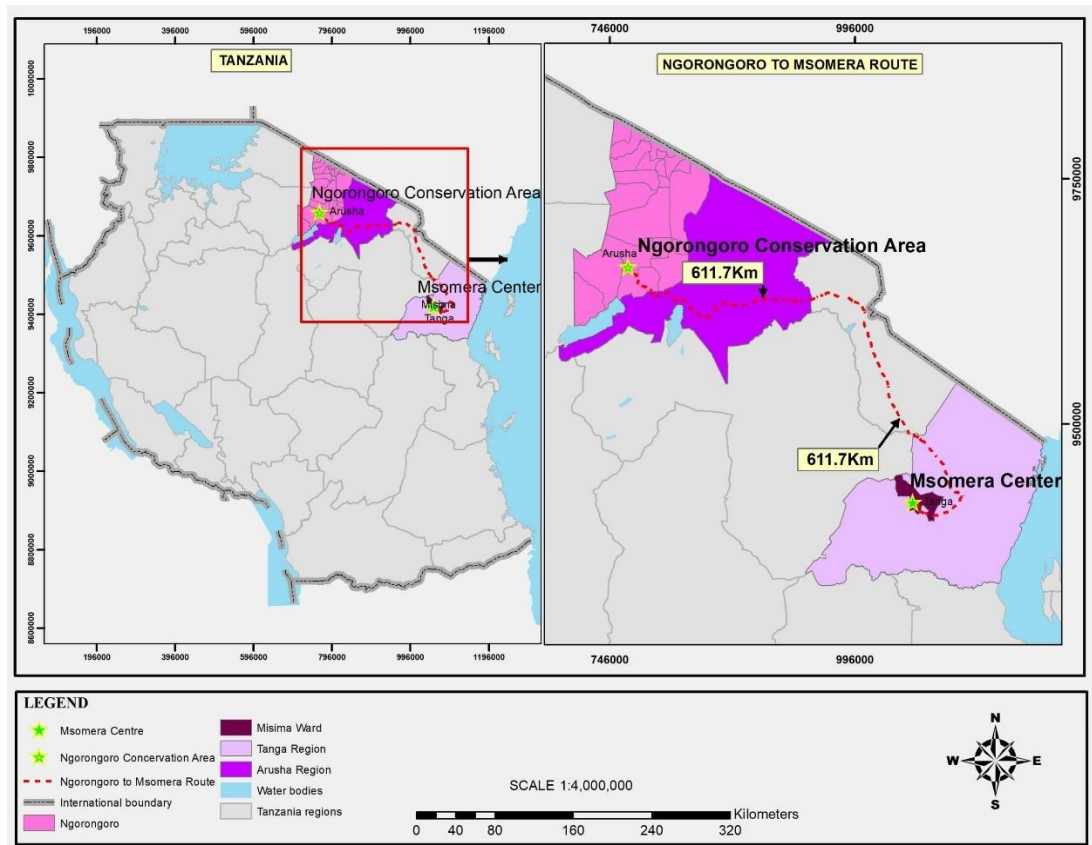


Figure 1-4: The Maasai people's current residence in NCA and resettlement zone at Msomera-Tanga-Source (Author 2024)



Figure 1-5: Panoramic view of Maasai homestead at Msomera-Handeni Tanga
-Source (JKT Media)



Figure 1-6: The Maasai new housing style at Msomera -Tanga-Source (Mbise 2022).

1.1.4 Why Maasai hesitancy to depart from the NCA?

The Tanzania Government's attempt to relocate the Maasai community from Ngorongoro to Msomera -Tanga, although well-intentioned sparked controversy and debate, leading to some Maasai members being hesitant to leave the NCA (Kannowski & Ngaiza 2022). In the Ngorongoro Conservation Area context, literature indicated that some of the residents living in NCA were reluctant to leave their current premises (UNDRR 2017). Key demotivating factors include the fear of losing their livelihoods and adherence to traditional beliefs.

The study by Estrada et al. (2022) contends that Indigenous Peoples share a deep, collective ancestral connection to their lands and natural resources. This relationship is rooted in their beliefs, practices, knowledge systems, and social norms, all of which rely on their physical, cultural, and spiritual well-being, as well as the resilience of the ecosystems they inhabit. The Maasai people's resistance to leaving the Ngorongoro Conservation Area (NCA) is shaped by a multifaceted combination of historical, cultural, and environmental elements. This challenges the notion that their presence disrupts nature conservation. Their sustainable practices, harmonious cohabitation with wildlife, and strong cultural identity are deeply connected to their traditional lifestyle, despite the lack of adequate social services (Kannowski & Ngaiza 2022). Land holds immense significance for the Maasai, as it not only shapes their culture, spirituality, and economic survival, but also represents a material and spiritual foundation that must be safeguarded and cherished, encompassing the traditional, cultural, and ethnomedical values found in the soil and plants that provide sustenance and healing for their community (Oleshangai; 2022).

In their study, Kannowski and Ngaiza (2022), outline various important concerns and areas for further investigation regarding the resettlement of the Maasai community from Ngorongoro Conservation Area (NCA) to Msomera village, emphasizing the necessity for future evaluation in specific domains. One of the key aspects is the future evaluation of the socio-cultural and economic effects of this initiative on the relocated Maasai community. This shows a significant gap for the relocation of Maasai to understand how their cultural identity and traditional practices may be impacted by environmental and lifestyle changes.

1.2 Problem Statement

The Maasai community, previously residing in their ancestral land of the Ngorongoro Conservation Area (NCA) was relocated to Msomera, Tanga, about 600 kilometers away. This move included the provision of modern housing and essential services. However, it was noted that the housing planning and development in Msomera did not adequately take into account the unique cultural components in its design. This relocation disrupted the Maasai's deep-rooted cultural connections and social ties to their original home. The shift to modern housing solutions poses significant challenges to the Maasai's cultural heritage and architectural identity, as these new structures may conflict with traditional lifestyles, impacting their built environment as they adapt to their new surroundings. Traditional architectural values were being replaced by modern designs that often overlook the community's social and environmental needs. The distinctive Maasai architecture in Msomera is undergoing considerable transformation, losing its originality and design values. Furthermore, the lack of a participatory design approach in the resettlement process raises concerns about the sustainability of new housing developments that should align with Maasai traditions.

This research aimed to explore the intersection of traditional Maasai architectural values and modern housing practices in Msomera-Tanga, assessing how cultural values can be integrated into the design process to foster a built environment that respects and enhances the Maasai's cultural identity. It also provides insights that can guide future housing projects, ensuring they are functional, culturally resonant, and sustainable for the Maasai community.

Numerous studies have highlighted the challenges communities encounter when relocating to new environments, particularly regarding housing. Often, the provided housing imposes a new lifestyle that residents find difficult to adapt to. This housing is typically seen as a finished product, neglecting the unique needs, traditions, and cultures of the relocated individuals. Consequently, residents must gradually adapt, modify, and rearrange their living spaces to aid in their process of rebuilding their lives.

Current challenges underscore the importance of applying design values in modern architecture while highlighting the urgent need to explore the intangible cultural values of housing in new resettlement areas for the Maasai community to preserve their cultural identity.

1.3 Research Objectives

1.3.1 General objective

The research intended to review housing provisions during the resettlement of the Maasai from Ngorongoro to Msomera-Tanga, examining the resulting cultural shifts, architectural changes, and their impact on the community's-built environment and cultural heritage.

1.3.2 Specific Objective

- i. To identify the traditional architectural values of Maasai housing following their resettlement from Ngorongoro to Msomera-Tanga.
- ii. To analyze how the traditional Maasai cultural values influence Maasai housing architecture in Msomera-Tanga.
- iii. To analyze the approach used in the design process of Modern housing provided at Msomera-Tanga.
- iv. To identify ways in which traditional Maasai cultural values can be integrated to positively influence future Maasai housing resettlement projects in Tanzania.

1.3.3 Research Questions.

- i. What are the key traditional architectural values reflected in Maasai housing following their resettlement from Ngorongoro to Msomera-Tanga?
- ii. How do traditional Maasai cultural values influence Maasai housing architecture in Msomera-Tanga?
- iii. What design approaches were used in developing the modern housing provided at Msomera-Tanga?
- iv. How can traditional Maasai cultural values be integrated to positively influence future Maasai housing resettlement projects in Tanzania?

1.4 Significance of the Study

The relocation of the Maasai tribe from Ngorongoro to Msomera Handeni Tanga is of significant importance due to several reasons:

- i. This research is vital for safeguarding Maasai cultural heritage by examining how housing influences traditional values and practices, while assessing the impacts of relocation on indigenous communities in new surroundings.

- ii. To enhance the effectiveness of the relocation process for indigenous communities, particularly the Maasai, by focusing on the critical role of housing in their adaptation and integration into in unknown surrounding.
- iii. The research provides valuable insights for policymakers on the challenges and opportunities associated with indigenous community relocations, potentially informing future relocation initiatives and policies.

1.5 Justification of the research

The Maasai tribe's resettlement from Ngorongoro to Msomera-Tanga has triggered a debate and controversy on social cultural impacts, economic and environmental impacts.

This study seeks to examine the profound cultural shifts within the Maasai community, focusing on architectural changes as a lens to understand the evolving dynamics of their built environment in the context of resettlement and its impact on their cultural heritage. This study became crucial in the following area:

Firstly, the relocation of the Maasai people from Ngorongoro to Msomera is an important topic to study as it helps us understand the impact on cultural tourism and the preservation of Maasai traditions in the face of modernization and development. This understanding can contribute to the sustainable management of cultural tourism and the protection of the Maasai cultural heritage (Mbise 2022).

Secondly, the Maasai people, like other indigenous groups, have a strong connection to the land, which plays a vital role in their cultural identity, spiritual practices, and traditional way of life. The Oldoinyo Lengai Mountain holds religious and spiritual significance for the Maasai community, serving as a site for prayer, fertility rituals, and healing. The relocation of the Maasai to Msomera may disrupt their deep-rooted connection to the land, affecting their culture and traditional practices (Kannowski & Ngaiza 2022; Oleshangai; 2022).

Thirdly, the ongoing controversy over the relocation of the Maasai from Ngorongoro to Msomera raises critical issues regarding cultural preservation, economic stability, and environmental sustainability. Researching this housing resettlement is essential to understand its impacts on the Maasai's traditional way of life and to ensure their needs and voices are considered in the resettlement process.

1.6 Conceptual framework

A conceptual framework is a researcher's interpretation of existing literature and personal observations about a phenomenon, guiding the actions and direction of the study (Landaburu 2016). Creating a conceptual framework requires clear articulation of your intentions, allowing you to prioritize important elements, determine significant relationships, and guide your data collection and analysis (Leshem and Trafford 2007).

1.6.1 The User-Centered Design (UCD) concept

From the perspective of the conceptual framework, the User-Centered Design (UCD) concept was innovatively adopted to guide this research study. User-centered design (UCD) is a design approach that prioritizes the user throughout the design process. This includes understanding the needs, wants and limitations of users to inform design choices. UCD incorporates principles and processes that focus on user interaction, especially involving local communities to ensure that their needs and experiences are at the center of the design and development, ultimately increasing usability and integration (Abbakyari et al. 2023).

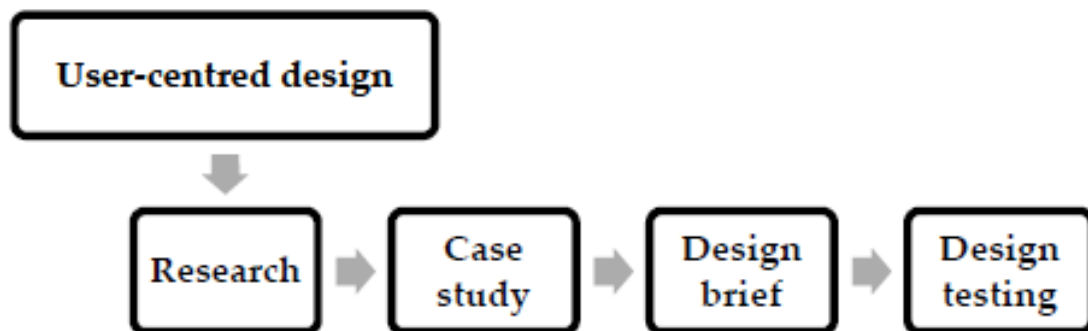


Figure 1-7: User-centered design process- Source Abbakyari et al.2023).

A user-centered design process can significantly enhance social sustainability by fostering community engagement, building social connections and networks, and empowering individuals. It takes into account possible future scenarios that embrace a diverse range of perspectives, needs, and advocates (Palich and Edmonds 2013). A user-centered design approach places the individual at the forefront of community development. This aligns with Sustainable Development Goal 11 of the United Nations, which emphasizes that “People must be at the center of human development, serving both as beneficiaries and drivers, individually

and collectively. They should be provided with the tools and knowledge necessary to build their own communities, states, and nations.” (Sridharan, Sharma, and Ji 2023).

Palich and Edmonds (2013), assert that empowering a community hinge on involving its members in the design process, and one effective way to promote a user-centered design approach is by allowing the process to shape the outcome. As illustrated in Figure 1.7, the process involves conducting research, evaluating case studies, developing an investigative brief, and testing designs. Research aims to identify key issues and adjust parameters, while case study evaluations engage stakeholders in exploring alternative design approaches and solutions. The investigative brief created by the design team assesses future scenarios based on these design alternatives, emphasizing contextual values and performance outcomes. In the end, design testing showcases these features to stakeholders, aiming to cultivate a sense of ownership among participants and resolve any possible conflicts, as highlighted by Palich and Edmonds (2013).

By adopting User-Centered Design (UCD), this research delves into the unique cultural and social landscapes of the Maasai people, enabling the development of housing that honors their traditions and way of their life. This method improves usability and accessibility, resulting in greater satisfaction and a smoother integration of the resettled community into their new surroundings. Involving the Maasai in the design process that foster a sense of ownership and belonging, which is essential for their overall well-being and successful adaptation to the new housing situation. Using UCD in this research ensures that the housing solutions are tailored to the unique needs of the Maasai, promoting a harmonious transition and enhancing their quality of life in the resettlement area.

Taking into account the values, beliefs, and customs of particular cultural groups help in creating housing that meets the needs of individuals, is suitable for the environment, and promotes effective use of space. This approach fosters a sense of belonging and enhances the well-being of residents. Various cultures possess unique traditions related to settlement patterns, building materials, architectural design, and the dimensions of structures. These factors, along with local skills, techniques, and construction technologies, must be integrated into housing design (Abbakyari et al. 2023).

1.7 Scope of the Study

1.7.1 Content scope

The study reviewed the housing provision during the Maasai's relocation from Ngorongoro to Msomera-Tanga, focusing on the cultural transformations, architectural adaptations, and their effects on the community's-built environment and cultural heritage. It identified traditional Maasai cultural values, assess their influence on architecture, evaluate the housing design process in Msomera, and explore how these values can enhance the resettlement project.

1.7.2 Geographical scope

The study focused on the Maasai community in northern Tanzania, specifically in Ngorongoro and Msomera-Tanga, with a relocation distance of approximately 600 km. Ngorongoro Conservation Area (NCA) is a UNESCO heritage site recognized for its multiple land uses, while Msomera is the resettlement location for the Maasai people.

1.7.3 The time Scope

The researcher has conducted a review of literature and reports from September 2023 to the current date, during which the relocation process is actively underway. Data collection for the relocation of the Maasai from Ngorongoro to Msomera Tanga took place between April 16, 2024, and June 7, 2024.

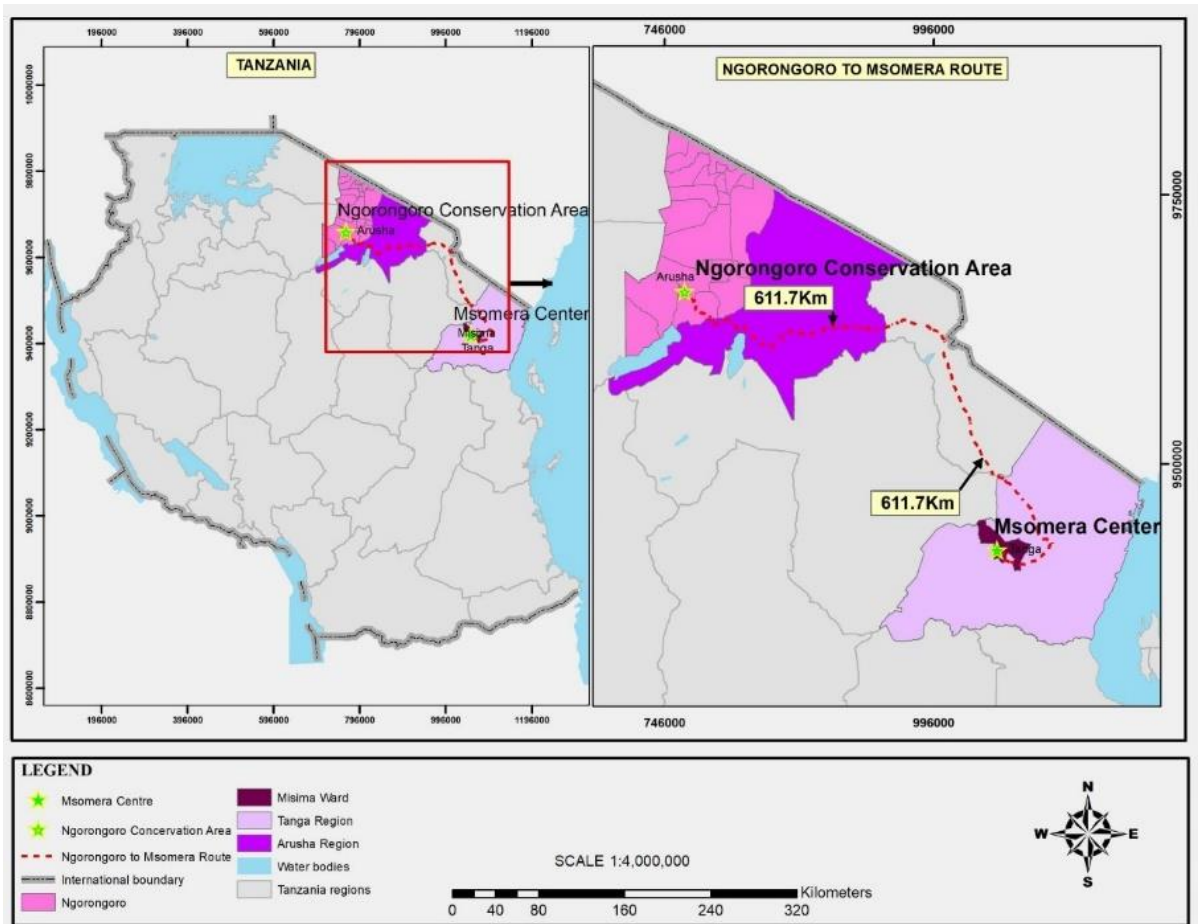


Figure 1-8: The study areas of Ngorongoro and Msomera-Tanga-Source (Author 2024)

CHAPTER TWO

2. Literature Review

2.1 Introduction

The content of this chapter discussed the relevant literature pertaining to the study topic. This includes Resettlement process in Architectural cultural perspective and the factors influencing the process of resettling, Key architectural cultural features and practices that identify the Maasai tribe, Cultural changes as a result of relocation as well as key considerations and best practices for developing an Architectural cultural resettlement framework for future relocation projects. The chapter provides a comprehensive and critical examination of the works of other authors through various publications such as articles, journals, books, reports, and similar sources, with the aim of providing insightful knowledge based on literature by other researchers and identifying possible knowledge gaps related to the research topic. This aids in addressing the research questions presented in the first chapter.

2.2 Community Resettlement

2.2.1 The Concept of Resettlements and their processes

Resettlement can be defined as the process of compensating physically displaced households by providing them with replacement plots and housing in one of two designated resettlement villages in the district, aiming to restore and enhance the living standards of those being resettled (State and Project 2017). It is a comprehensive process that includes multiple stages and objectives for relief activities, covering aspects such as displacement, transitional housing, and permanent resettlement sites (Danquah, Attippoe, and Ankrah 2014).

Resettlement has become an increasingly popular strategy employed by international development organizations such as the World Bank and national governments to bolster regional and national development efforts (Gomersall 2018; Wilmsen and Rogers 2019). When land is required for alternative purposes like infrastructure development such as building dams or roads, people and communities are often resettled (Asiama et al. 2017; Bryan Tilt, Drew Gerkey 2016), extensive extraction of natural resources (Owen et al. 2024; Usman and Balsalobre-Lorente 2022) and conservation of nature which include nature reserves and

ecological restoration (Aguirre-Salado et al. 2017; Karanth et al. 2018). Resettlement is a byproduct of other projects in these instances (Gomersall 2018).

Most resettlements can manifest in two forms, either as a voluntary choice or involuntary resettlement (Kurt 2013; Wilmsen and Wang 2015). Resettlement is considered voluntary when the affected population has the option to stay, while it is deemed involuntary if this choice is not available (Soltau and Brockington 2007; Wilmsen and Wang 2015). It is often assumed that if a resettlement is voluntary then it is likely to produce better outcomes for those displaced. Resettlements should be based on a commitment to settlement and not just resettlement. Unlike the involuntary resettlements analyzed by Scudder (2012), voluntary resettlement reportedly has a better record of success (Baert, Kervyn, Kagou, Guedjeo, Vranken 2020).

Soltau and Brockington (2015, Page 2) defines involuntary resettlement as “*the compulsory removal processes initiated when a project’s need for right of way is deemed to override the ‘right to stay’ of the inhabiting populations*”. Involuntary resettlement doesn't give you the choice to stay, however, prior to relocation, free, informed consent should be obtained (Wilmsen and Wang 2015). While what is termed involuntary may include the prior, free, and informed consent of some affected individuals, it can also encompass their willingness to relocate and a range of available options.

The resettlement scheme in Korup National Park in Cameroon south west is an example of voluntary resettlement aimed at protecting wildlife and biodiversity (Soltau and Brockington 2007). Although there have been contentious discussions regarding the effects on human rights and local livelihoods, the resettlement is characterized as 'voluntary' in protected area since it was premeditated, people were informed from the beginning of the planning phase, and they made the decision to move (Baert, Kervyn, Kagou, Guedjeo, Vranken 2020).

Resettlement can be traumatic both economically and culturally, as local communities may not be satisfied with the reallocated sites and often experience a loss of their sense of belonging, leading them to return to their original site (Peng et al. 2020). This has been reinforced by other researchers. Hiruy, (2009), argued that the outcome of resettlement is highly influenced by past and present social and emotional experiences. Recognizing the clear link between past and present social and emotional experiences related to resettlement and a sense of belonging is a significant insight. Most relocated individuals feel a strong attachment to their original places due to their cultural beliefs. This notion is further reinforced by Shampa Mazumdar and Sanjoy

Mazumdar (2004) who argue that emotional experiences in sacred places foster place attachment and hence identity. Nevertheless, place attachment can be described as the emotional connection that individuals form with a location where they wish to stay and where they feel secure and at ease (Hiruy 2009). Understanding these themes is crucial for addressing the complex dynamics of community resettlement and provides a framework for tackling social, spatial, and economic issues related to resettlement (Yang and Qian 2021).

Successful community resettlement relies heavily on the implementation of effective resettlement programs throughout the resettlement process. Community resettlement programs refer to initiatives aimed at relocating communities from their original lands to new areas. The primary goal of most resettlement programs is to successfully rebuild the livelihoods of resettled individuals and communities, which can be achieved through the provision of housing, livelihood support, access to land and tenure system, environmental issues, education, healthcare, and social services (Lao and Alton 2004).

Resettlement programs can have both positive and negative consequences for Indigenous communities. On one hand, Indigenous community resettlement programs may offer economic opportunities and access to services but on the other hand, they can lead to the loss of traditional lands, cultural erosion, and negative impacts on mental health (Walelign and Lujala 2022). The programs, in certain instances, have worsened poverty and increased vulnerability for both the resettled individuals and communities (Rogers and Xue 2015). After being resettled, individuals often choose to either return to their original homes or migrate elsewhere, leaving behind those who stay with limited opportunities to rebuild their lives in the new location (Artur and Hilhorst 2012; Connell and Lutkehaus 2017). Choosing the most promising resettlement locations during the planning phase of a program relies on understanding available resources, contextual factors, and the need to minimize impoverishment risks while facilitating the reconstruction of livelihoods for both individuals and communities (Bukvic 2018; Sipe and Vella 2014). The selection of resettlement places has received minimal attention thus far (Bukvic 2018; Peng et al. 2020).

The study conducted by Astuti et al. (2023) indicate that the success of the resettlement project is heavily reliant on a collaborative process, which has resulted in improved livelihood assets such as land tenure, housing, and urban infrastructure, as well as social assets, while also creating opportunities for future development in the area. The collaborative process needs the

government to incorporate its plans and seeks input from the affected community, ensuring their involvement in decision-making, choice of relocation site, and access to necessary support systems in their new place of residence (Terminski, 2013).

In the past, unsuccessful resettlement strategies have been attributed to factors such as inadequate design, insufficient infrastructure, ownership disputes, cultural inappropriateness, and affordability challenges (Sridarran, Keraminiyage, and Fernando 2018). Furthermore other previous studies conducted in developing nations have shown that factors such as compensation amounts, the population's prior negative experience with natural disasters, the appeal of the resettlement destination, the extent to which the affected population participated in the program's design, and the amount of land offered to households all influence people's willingness to accept resettlement programs (Chen, Vanclay, and Yu 2021; Peng et al. 2020).

By comprehensively addressing the various factors associated with the resettlement process and incorporating them into the planning and implementation of initiatives, it becomes possible to create a more inclusive, sustainable, and successful resettlement process.

2.2.2 Theoretical Resettlement trends

Throughout history, it has been observed that the settlements of individuals undergo changes as cultural values evolve over time. Societies experiencing rapid and significant transitions serve as valuable opportunities to examine this phenomenon. The indigenous communities like Maasai people are a prime example of such a group, as a casual observation would reveal their remarkable transformation within a relatively brief timeframe. In most resettlement projects, settlements might tend to change with their changing cultural values, especially during periods of rapid transition (Rukwaro and Mukono 2001).

Li and Feng (2021) in their research argued that in most resettlement projects, migrants are likely to feel happier if they are satisfied with the housing resettlement allocation mode, housing resettlement quality, and the living space. Furthermore, the study conducted by Yang and Qian (2012), indicate that Community resettlement poses several key issues, including social mismatch, space mismatch, and spatial mismatch. These challenges disrupt social networks and community bonds, making it difficult to restore and rehabilitate them in new communities. Social mismatch arises from the gap between social needs and available resources in the resettlement area. Space mismatch involves the inadequacy or misallocation of physical spaces in urban resettlement contexts. Spatial mismatch occurs when available jobs are not located

near workers' residences, particularly in urban areas. In other cases the resettlement housing often fails to consider the unique needs, norms, culture, and way of life of relocated individuals, leading them to adapt their living spaces incrementally to cope with their new environment and restore their livelihoods (Eerd 2023).

2.2.3 Resettlement trend from Protected Areas (Pas)

Resettlement of local people from protected areas (PAs) has been seen as a beneficial strategy to alleviate pressures on wildlife conservation. More than 70% of the world's Protected Areas (PAs) are inhabited by human populations (Peng et al. 2020). In this context, a Protected Area (PA) refers to a clearly defined geographical region established with the long-term goal of conserving nature, including its associated ecosystem services and cultural values. PAs are recognized, dedicated, and managed through legal or other effective means (Mitchell et al. 2018). The increasing anthropogenic pressures have become a pressing concern in achieving the established goals of PAs to safeguard against ecological deterioration and to maintain biodiversity (Loos 2021; Mitchell et al. 2018). Displacement can be economically and culturally traumatic, causing dissatisfied communities to lose their sense of belonging and often prompting them to return to their original sites for survival (Peng et al. 2020). Ecological relocation (ER) programs, relocating residents from ecologically fragile areas or areas with high conservation values, are one of the most prevalent tools used in PAs globally for relieving environmental pressure (Feng et al. 2024; Lasgorceix and Kothari 2009).

2.2.4 Factors influencing the resettlement process

Several studies identified common factors influencing the resettlement process, particularly individuals' willingness to relocate and satisfaction with their new homes, categorized as physical, environmental, and socio-economic (Manatunge and Abeysinghe 2017). These factors play a crucial role in determining how effectively communities adapt to new living conditions after relocation.

In their study, Peng et al. (2020) identified several key factors that influence a community's decision to relocate. These include attachment to place, considerations for future livelihood, the quality of the residence location, and the availability of relocation packages that include agricultural land. These factors collectively shape individuals' willingness to move and their perceptions of the benefits associated with relocation.

Shrestha et al. (2023) identified key factors influencing a community's relocation decisions, including the design and layout of housing, modification flexibility, and utility spaces like kitchens, gardens, and cattle sheds. They also noted the importance of house completeness, thermal comfort, and social and cultural features, such as traditional hearths and spaces for rituals and events

2.3 The traditional Housing

2.3.1 The concept of Traditional Housing

The characteristics of traditional architecture play a crucial role in the development of societal life. They embody a shared understanding of existence, reflected through the form and spatial hierarchy of the built environment (Duque Estela 2002). Traditional houses are fundamental architectural elements that serve as expressions of humanism, folklore, and culture, designed to meet the daily needs of society (Ali 2007). Traditional houses are consistent and adapted to their surrounding environment. Furthermore, they represent a straightforward architectural heritage shaped by the collaboration and understanding among users, builders, and other elements over generations (Hui, 2011).

The traditional Malay house in Negeri Sembilan serves as a prime example of Malaysia's rich cultural heritage, designed to reflect the cultural and local needs of society (Yuan 1987). Most importantly, the traditional Malay house serves as a reflection of society's beliefs, morals, and ideologies, grounded in a rich cultural legacy (Ismail & Sani 2002), Fig 2-1 and 2-2.



Figure 2-1: The traditional Malay house reflects the beliefs, morals and ideologies of society, rooted in a rich cultural legacy-Source (Hosseini et al. 2012).



Figure 2-2: Traditional houses reflect a clear architectural heritage formed through the cooperation of users, builders and artifacts over generations-Source (Hosseini et al. 2012).

It is argued that substantial design values exist within the context of Malay traditional houses, and the neglect of regional factors like culture, site, climate, and conventions in contemporary architecture highlights a contradiction, prompting some scholars to focus on traditional design values in their work (Sennott 2004). The signature of Malaysian Traditional Architecture (MTA) is experiencing significant changes in contemporary architecture, leading to a disregard for its originality.

The survey conducted by Langhein (2005) on traditional houses revealed that the aesthetic quality of traditional architecture is fundamentally rooted in people's inherent needs to create enduring spaces that are well-adapted to their environmental conditions. The forms of traditional houses are influenced by cultural aspects and environmental factors. The design process of these houses meets key societal requirements, such as the preservation of a consistent dwelling form while allowing for necessary adjustments (Iskandar, 2001). This consistent form, as a variable, has been able to adapt to the specific needs of families and the conditions of the built environment, such as site and climate (Rapoport 2008). Therefore, the characteristics of cultural and traditional societies must be passed down to future generations as a means of preserving cultural roots (Ismail & Sani, 2002).

Significant of Malay Traditional House

The central idea of collective thinking and design is based on traditional architecture. This approach highlights the metaphorical, symbolic, and abstract aspects that contribute to the originality of architectural styles. The harmonious lifestyle of people's beliefs, cultural practices, and daily living in Malay traditional houses is an important part of Malay culture (Hosseini et al. 2012). The physical and spatial features of traditional buildings are shaped by the Malays' needs and customs related to purity (Iskandar, 2001). Additionally, traditional

Malay architecture reflects moral and religious beliefs that are integral to its philosophy (Eraña, 2008). The adaptation of Malay traditional houses to the culture, lifestyle, and social and economic needs of the Malays creates a high-quality housing that fits well within its environment (Hosseini et al. 2012). The consistent features of traditional Malay architecture are shown through the repetition of elements, which reflect the underlying ordering principles that shape these buildings (Eraña, 2008). The floor, wall, and roof are the three essential elements of traditional Malay houses, which have been the primary focus in most research on this architectural style (Tahir et al. 2010). Culture is a crucial factor in shaping the design and form of the Malay traditional house.

Common features of Malay houses include being elevated above the ground and having varying levels in different regions, while the roof designs are important for the tropical climate, incorporating decorative panels that help regulate ventilation and sunlight (Iskandar, 2001). The form of the Malay traditional house is characterized by solid wooden columns and various openings, such as windows, which reflect the lifestyle and culture of its inhabitants (Hosseini et al. 2012). The cultural and traditional lifestyle in Malaysia significantly influences the physical, spatial, and functional aspects of its houses. There are three factors which directly affect how the space is planned to meet all necessary functions which the structure and appearance of the house, how space is organized, and the daily activities of the people living there (Ismail & Ahmad, 2006). The spatial organization of the Malay traditional house is designed to provide convenience for its occupants by taking into account cultural aspects, daily needs, and the activities of everyday life (Ali 2007). The Malay traditional house serves as a flexible guideline for contemporary housing design, with its physical attributes reflecting underlying principles that influence its construction and form (Iskandar, 2001).

2.3.2 Traditional Architectural Design values

By Considering the significance of traditional architectural design values, there is a clear connection between general and specific design values in contemporary architecture that relates to traditional architecture. The design values that architects use can change over time because they are influenced by the ideas and beliefs of society during different periods (Holm, 2006). The design movement, characterized by the different expressions of specific design values, is considered to be based on the essential requirements for creating a satisfactory design. While some traditional design values have changed over time, several stable values remain dominant

in the development of contemporary architecture (Holm, 2006). When considering the role of social values in traditional architecture, the assessment of buildings needs to focus on the culture of the people and the specific characteristics of the surrounding environment (Wasserman, Sullivan, & Palermo, 2000).

2.3.3 Influence of Culture on Housing

A house serves not only as a physical living space but also as a venue for social interactions and rituals. The concept of culture and its manifestations are reflected not only in people's perceptions, beliefs, values, norms, customs, and behaviors but also in the design of objects and the physical environment, including homes and neighborhoods. Houses reflect culture both in their intentional design and daily use. The forms of houses, their internal layouts, and the arrangement of dwellings within a neighborhood can either support or disrupt the culture of their occupants (Ozaki 2002). When selecting a residence, individuals choose both the type of housing and the residential environment based on their needs, preferences, income, and housing market opportunities (Dieleman & Mulder, 2002). The above studies indicate that future planning and development of traditional housing should take into account these cultural components and resonate with the spirit of the community.

2.3.4 Traditional Housing Design

Traditional housings are mainly constructed with traditional materials using low cost and simple construction technology. They comprise dwellings and other buildings built by the people. Traditional buildings are usually owner or community built. They are not created by specialists; instead, they emerge from a collaborative process involving many people over generations and are rooted in empirical knowledge. This is why traditional architecture is often called communal, popular or folk architecture and even “architecture without architects” Construction of Traditional housing apply knowledge that considers local culture, sustainable issues, and cultural values (Ortega et al. 2017; Rudofsky 1965). The cultural impact on a building consists of the complete range of human values, activities, and artifacts that shape its design, imparting meaning and guiding the lives of its occupants (Oliver 2006). Most modern housing today is mass-produced, limiting residents' ability to tailor their living spaces to their behavioral needs and cultural backgrounds. The design of modern link houses is typically more structured, featuring fixed, enclosed areas designated for specific activities (Ali 2007).

2.3.5 Factors influencing Traditional Housing Architectural Design

According to Ozaki (2002), cultural values significantly shape the forms of traditional housing. While non-cultural factors such as climate, construction techniques, and cost also influence house design, they are considered secondary to socio-cultural factors. Key cultural influences include the status of women, privacy, housing layout, and the physical arrangement of the house. Cultural values and norms take precedence over non-cultural factors, fundamentally shaping the architectural design of homes. Yosef Jabareen (2005) highlighted the importance of socioeconomic and demographic variables of participants, along with cultural components such as ritual spaces, the arrangement of dwellings, and the internal layout of homes. These factors play a crucial role in shaping community interactions and environments.

Major factors

a) Housing orientation

The orientation of buildings in traditional settlements is a crucial aspect of their architectural and cultural identity, reflecting both practical environmental adaptations as well as deeper symbolic meanings within the local community (Wijaya and Dwijendra 2021). This is evidenced by a case study of selected tribes conducted at Indonesia.

- *The case study of selected tribes in Indonesia*

The study conducted by architectural researchers in Indonesia on traditional housing settlements shows that the orientation of buildings differs across various regions due to the diverse cultural beliefs, practices, and contextual factors of the local communities (Wijaya and Dwijendra 2021). The Indonesian country, long before the introduction of other cultures, had ancient belief systems such as animism, which involves the belief in spirits or ancestors, and dynamism, which holds that large trees or stones possess a soul or spirit (Afandi 2018; Hasan 2012). The ancient belief systems of animism and dynamism in Indonesia have significantly influenced the spatial orientation and organization of vernacular settlements, which are often oriented towards the view of ancestors or gods believed to reside on the tops of mountains or higher elevations.

The key themes identified in the study on the Matabesi tribe's traditional housing settlements in Indonesia (Fig 2-1) are the reverence for Mount Lakaan as the orientation direction, the

harmonization of the settlements with the natural environment, and the integral role of rituals in maintaining this perceived harmony (Amabi and Dima 2020).

The Musi River settlements in Indonesia (Fig 2-2), exhibit building orientations towards the road, land, and river topography, with the primary focus being the river as the local community's livelihood source. The study identified key themes related to river orientation, accessibility, and the overall context of the riverside settlements (Fitri 2019).

The Singengu upland settlement in Indonesia (Fig 2-3), has a linear pattern with houses aligned along a sacred axis between the Bincar (sunrise) and Banom (sunset) directions. The spatial layout follows a hierarchy of sacred, neutral, and profane spaces, with the settlement development starting from the Banom direction towards the Bincar direction, reflecting the belief that the rising sun is the source of life (Nuraini, Djunaedi, Sudaryono, and Subroto, 2014).

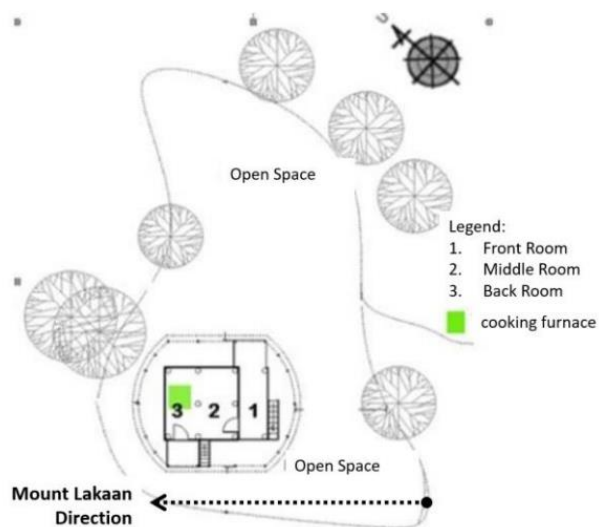


Figure 2-1: Orientation direction of Matabesi tribe settlement buildings
-Source (Amabi and Dima 2020).

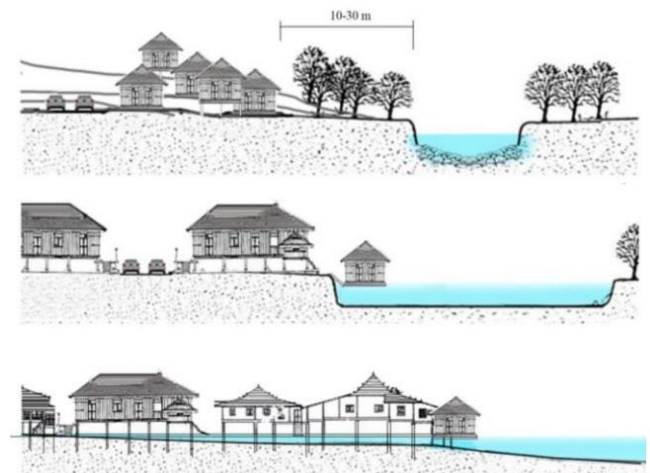


Figure 2-2: Orientation direction of buildings
along Musi River-Source (Fitri 2019)

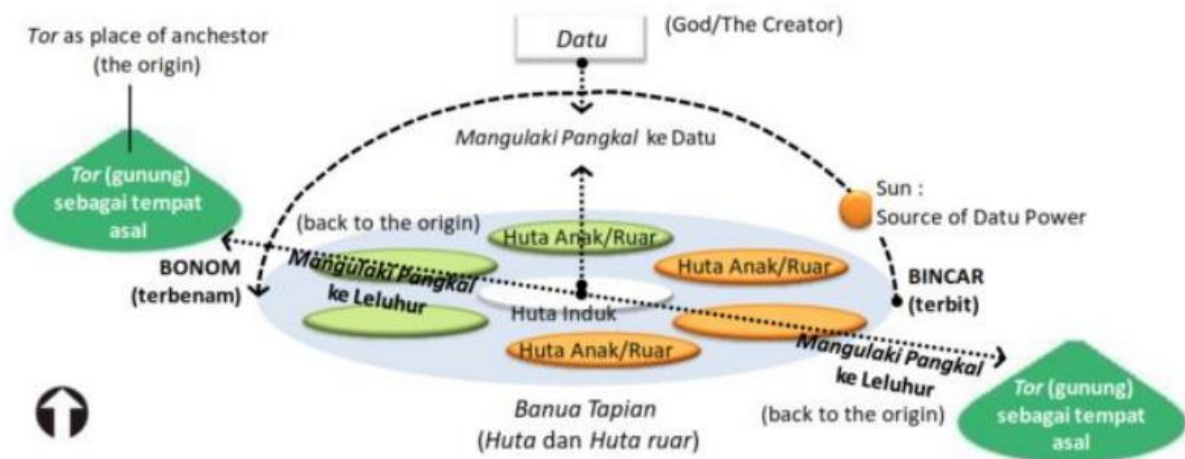


Figure 2-3:Orientation of Singengu village settlement-Source (Nuraini, Djunaedi, Sudaryono, and Subroto, 2014).

The study on traditional housing settlements in Indonesia found that the spatial orientation of vernacular architecture is influenced by the ancient belief systems of animism and dynamism. These belief systems led to orientations that symbolically revered mountains, higher elevations, and places of origin, as well as orientations that were logically aligned with sources of life such as the sea, rivers, and the rising sun. This reflects a transcendental relationship with deities/ancestors and an immanent connection to the place of origin.

b) Spatial Organization

The spatial organization of human settlements often mirrors the sociopolitical, economic, and belief systems, along with the social relationships among families (Shahack-Gross et al. 2004). Space organization is a crucial aspect of architectural theory, as it reflects the lifestyle, habits, and cultural practices of a society (Eskandari 2011). The overall spatial organization of housing is shaped by the culture of the community. In traditional architecture, houses are organized into distinct zones to reflect the hierarchical structure of society. For instance, the spatial configuration found in traditional Malay housing reflects social and cultural patterns, as well as religious values. A key characteristic of these houses is their spatial flexibility. The design pattern of housing is chosen by users (Raviz et al. 2015). Factors such as plot size, distance between houses, house arrangement, and the inclusion of essential spaces for rural households like animal sheds and ritual areas play a significant role in ensuring user satisfaction (Shrestha et al. 2023).

c) Materials used for construction of traditional housing

The materials used for the construction of traditional housing varies across different locations and cultural contexts, primarily due to the availability of local building materials. Most communities build their traditional houses to suit their specific cultural and climatic conditions, utilizing the readily available local resources(Zámolyi 2021). The common local materials for traditional housing construction include wood, bamboo, thatch, straw, stone, mud, and clay(Udoudoh and Bassey 2021).

The selection of local materials for traditional houses is influenced by the area's climatic conditions, ensuring both thermal comfort and durability. The use of traditional building materials in housing construction has largely been neglected, despite their availability, affordability, and ability to meet modern needs when effectively utilized. Assessing their suitability and usability, alongside developing effective maintenance strategies, enhances the durability of houses and creates a conducive living environment within the community(Chuki, Sarkar, and Kurar 2017; Zámolyi 2021).

d) Thermal comfort in traditional housing

Thermal comfort is defined as "the condition of mind that expresses satisfaction with the thermal environment." In traditional housing, thermal comfort is impacted by limited natural ventilation and insufficient natural light. Many traditional buildings, both primitive and vernacular, showcase innovative solutions for weather resistance and indoor comfort, particularly in African countries where they are well-adapted to local climatic conditions (Udoudoh and Bassey 2021).

e) The Climate

Our environment, particularly climate and geographical location, significantly influences building practices and community vulnerability to climate change (Bobadoye et al. 2016). Climate-sensitive design, which prioritizes performance and energy efficiency based on climatic data and conservation, is essential in traditional housing architecture (Çakıcı and Takva 2023). Traditional buildings serve as exemplary models today due to their energy-efficient design approaches (Petrucchi 2023). Implementing energy-efficient solutions in traditional buildings helps to lower energy consumption and reduce carbon emissions (Webb, 2017). Traditional building typology is distinct from other structures due to its unique physical

characteristics (Cosgun et al. 2023). Traditional buildings utilize local construction methods and natural materials, featuring door and window openings along with ventilation systems, which enhance energy circulation and sustainability, allowing them to maintain their functions over time. In climate-sensitive design, the building's plan, façade, roof, and materials must be carefully considered, with orientation playing a crucial role. It is essential to account for wind effects and sunlight penetration through openings when positioning houses (Çakıcı and Takva 2023; Petrucci 2023).

2.4 Resettlement/relocation Policy and Legislative Background in Tanzania

There are a few national and state laws, policies or programs governing or related to displacement of local communities from PAs.

2.4.1 National Tourism Policy 1999

The primary objective of national tourism is to enhance the economy and improve the quality of life for individuals, particularly by alleviating poverty. This is achieved through the promotion of sustainable and high-quality tourism, which positively impacts cultural, social, environmental, and financial aspects. There is a commitment to manage tourism resources as public assets and to enhance existing tourism infrastructure to increase revenue in this sector.

2.4.2 World Bank Involuntary Resettlement Policy (OP 4.12)

The World Bank's Operational Policy on Involuntary Resettlement (OP/BP 4.12) is applicable in cases of involuntary land acquisition. This includes the loss of anything permanently affixed to the land, such as buildings and crops, as well as impacts on assets, income sources, or livelihoods, regardless of whether relocation is necessary. The policy addresses the direct economic and social effects stemming from land acquisition, including relocation, loss of shelter, and diminished access to resources or income sources.

2.4.3 Graves (Removal) Act No. 9 of 1969

The Act allows for the removal of graves from land needed for public purposes and provides compensation for related expenses, including removal, transportation, reinstatement, and any accompanying ceremonies. Compensation for sacred sites, which include altars, initiation centers, and ritual sites, is negotiated with relevant parties. These sites are acknowledged as

sacred by local laws and cultural practices. To prevent conflicts among individuals, communities, and local governments, the use of sacred sites for project activities is prohibited (Eriksson 2010; Jilala et al. 2022).

2.4.4 Ministry of Natural Resources and Tourism (2017)

Resettlement Policy Framework for the Resilient Natural Resources Management for Tourism and Growth Project in Dar es Salaam: The aim of the Resettlement Policy Framework is to manage the displacement and resettlement of human populations from protected areas in order to promote the protection of the environment and increase the quality of life for local communities. In general, these laws and policies measures aim to ensure the sustainable development and well-being of both the local communities and the natural environment. They strive to strike a balance between conservation efforts and the rights and needs of local communities, recognizing the importance of cultural preservation and community participation in decision-making processes.

2.5 Ngorongoro Conservation Area (NCA)

2.5.1 NCA Area as a protected area

Protected areas (PAs) make up about 25% of the land in Tanzania. As of today, these areas consist of 16 national parks, 28 game reserves, 44 game-controlled areas and the Ngorongoro Conservation Area (NCA) (Johanne and Aure, 2019, pg. 1). The NCA, governed by the Ngorongoro Conservation Area Authority (NCAA), is a UNESCO world heritage site (Sirima and Backman 2013). Protected area refers to an area of land /or sea especially dedicated for the protection of and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or effective means (Dudley and Stolton 2008).

Maasai people are indigenous renowned to leave in NCA where the NCA is a UNESCO World Heritage site controlled by the Ngorongoro Conservation Area Authority (NCAA) (Nilsson and Salazar 2017). The Area has been granted as a World Heritage Site due to its unique combination of land use, harmoniously allowing for the coexistence of people, wildlife, and habitat (Bellini 2008; Elifuraha Laltaika 2014; Nilsson 2016; Oleshangai; 2022; Sirima and Backman 2013). The term "multiple land use" implies the co-existence of the Maasai pastoralists and Wildlife. Because of the Ngorongoro Crater Highlands' exceptional cultural significance to the Maasai people, the NCA was designated as a multiple land-use area.

However, the NCA also includes the eastern third of the Greater Serengeti Ecosystem, notably the volcanic grasslands where the migratory Serengeti wildebeest give birth to their young every February (Ikanda and Packer 2008).

For centuries Ngorongoro has also been the homeland of pastoralists and hunter gatherers. Based on current estimates, the population of the Maasai at NCA is around 120,000 individuals (Mbise 2022). With the exception of small communities of Tatoga and Hadzabe, the majority population at NCA consists of Maasai people, who are often prominently featured on tourist posters and brochures as the iconic symbol of Tanzania (Nilsson 2016; Oleshangai; 2022). The Maasai people are pastoralists who live nomadic lives, and their way of life and culture are deeply ingrained in their natural environments (Oleshangai; 2022). The majority of the Maasai pastoralists residing in Ngorongoro were methodically moved from the Serengeti region when the Serengeti National Park was created in 1959. The Ngorongoro Conservation Area is a unique Protected Area that harmonizes the growth of pastoralists and the tourism industry with the conservation of soils, vegetation, wildlife, and watersheds through the application of multiple land use principles (Elifuraha Laltaika 2014).

The Ngorongoro Conservation Area (NCA) in Tanzania is classified as an IUCN Category V protected area. Category V recognizes areas with significant ecological, biological, cultural, and scenic value resulting from long-term human-nature interaction. Consequently, the area and its corresponding characteristics are safeguarded and maintained. As such, the NCA and its associated features are protected while allowing the Maasai people to continue coexisting with wildlife through activities like pastoralism (Mbise 2022). To Maasai pastoralists, landscape is not just understood to offer pasture, water and salt licks but known to support multiservice roles including cultural identity, spiritual and ritual functions (Oleshangai; 2022). Preserving the Ngorongoro Conservation Area not only showcases its natural wonders but also enhances local livelihoods and fosters economic opportunities through conscientious tourism practice (URT 2000).

2.5.2 Unique features/ Elements in Ngorongoro Conservation Area

The Ngorongoro, aptly named the "gift of life" in Maa, holds the title as the cradle of mankind and boasts the world's highest concentration of large mammals within its vast Ngorongoro Crater, the largest intact caldera on Earth (Nilsson 2016). It has been popularly described as 'the eighth wonder of the world' – the Garden of Eden due to its unique distinguishing

Elements/ features such as natural landscapes, diverse wildlife, and rich cultural heritage. These features make the NCA a popular tourist destination for safari tourists from all over the world.

a) Diverse Landscapes

The Ngorongoro Conservation Area is renowned for its stunning natural beauty, diverse ecosystems, and encompasses vast expanses of highland plains, savanna, savanna woodlands, forests, and valleys (Johanne and Aure 2019).



Figure 2.1a: The landscape surrounding the Maasai Boma Seneto-Source: (Johanne and Aure, 2019).



Figure 2.1b: Forest Landscape as seen from Rhino lodge-Source: (Johanne and Aure, 2019).



Figure 2.1c: Maasai Livestock grazing next to a herd of Zebras-Source: (Johanne and Aure, 2019).



Figure 2.1d: Ngorongoro crater seen from the rim-Source: (James Bellin 2008).

Figure 2-4: 2a, 2b, 2c, 2d: Diverse Landscape at Ngorongoro

b) Wildlife

The Ngorongoro Conservation Area is famous for its diverse wildlife, including the African Big Five, a high density of predators, and the annual migration of wildebeest, zebra, and gazelles into the northern plains. The wildlife in the NCA (Ngorongoro Conservation Area) has various values, including ecological intrinsic values, aesthetic and recreational values, and market values. The dominant stakeholders in the area are the NCAA (Ngorongoro

Conservation Area Authority) and tourists, as well as the Maasai community and the NCAA (Johanne and Aure 2019).



Figure 2-5: Herd of animals in Ngorongoro crater -Source (Johanne and Aure 2019).

c) The home of archaeological and paleontological site

The Ngorongoro Conservation Area (NCA) holds significant importance as it is home to the renowned archaeological and paleontological site known as Olduvai Gorge, which contains fossil evidence of the earliest origins of the human race (Elifuraha Laltaika 2014).

d) Ngorongoro Crater

The most prominent feature of the area is the Ngorongoro Crater, which is the world's largest intact volcanic caldera. It is a bowl-like structure formed when a volcano collapsed on itself millions of years ago. The crater is home to a wide range of wildlife, including a healthy population of most species of wildlife. The Ngorongoro Crater, representing the landscape in the NCAA's conservation focus areas, sustains the ecosystem and attracts tourists due to its diverse wildlife, offering a concentrated area for observing a wide range of animals (Johanne and Aure 2019).



Figure 2-6: The Ngorongoro Crater as seen from Ngorongoro Wildlife Lodge -Source (Johanne and Aure 2019).

e) The Uniqueness of the area

The Ngorongoro Conservation Area is exceptional due to its unmatched singularity, providing a unique experience that is unmatched anywhere else in the world. It is a genuinely remarkable location because of its remarkable visual and recreational advantages, as well as its inherent ecological attributes (Johanne and Aure 2019).

f) Climate and natural resources

Climate and natural resources in the NCA hold great importance as they supply vital water resources, like rainfall, which are essential for sustaining the livelihoods of both the local community and the animals, particularly the Maasai who rely on the growth of grass to support their livestock; furthermore, the Maasai informants' perspective of nature as a resource provider, referred to as "the Motherland," reflects their reliance on and deep respect for the natural environment (Johanne and Aure 2019).

g) Cultural Heritage

The Ngorongoro Conservation Area is also significant for its cultural heritage. It is inhabited by the semi-nomadic Maasai pastoralists, who have a deep connection to the land and their cattle. The Maasai people have a rich spiritual, artistic, and cultural heritage that they are willing to share with visitors to their villages and boma (Johanne and Aure 2019).

2.5.3 Land use Practices in Ngorongoro Conservation area (NCA)

The Maasai community in the Ngorongoro Conservation Area (NCA) follows a land tenure system governed by 'native law and custom'. This system involves a concept of communal ownership, with some degree of private ownership over livestock, water, and land (Oleshangai; 2022). In Tanzania, all land is held in trust by the President on behalf of all citizens (Shampa Mazumdar, Sanjoy Mazumdar 2004). This principle is established in the Constitution of Tanzania and further clarified in the Land Act of 1999. The recognition of all land as public land allows for centralized control and management of land resources in the best interest of the people.

For centuries, the Maasai have been the inhabitants and stewards of the land in East Africa's Great Rift Valley. Their way of life, livelihoods, and culture are closely tied to the flourishing ecosystems that surround them. (Oleshangai; 2022). In some cases the Maasai people, known for their semi-nomadic lifestyle centered on livestock herding, prioritize mobility as a crucial aspect of their culture and livelihoods, with their herds and households constantly moving in a deliberate but unpredictable manner around water and pasture (Coast 2002). Land holds immense significance for the Maasai, as it not only shapes their culture, spirituality, and economic survival, but also represents a material and spiritual foundation that must be safeguarded and cherished, encompassing the traditional, cultural, and ethnomedical values found in the soil and plants that provide sustenance and healing for their community (Oleshangai; 2022).

Maasai's mobility on land is not solely determined by their cultural practices but is also influenced by external factors such as land tenure systems, land grabbing, and environmental changes. Mobility refers to an amalgamation of spatial and social elements, broadly understood as movement infused with meaning (Kuusisto-Arponen 2009).

As of today, the Maasai have maintained a structured land use system that enables the systematic distribution of land resources to sustain mobile pastoralism and cultural traditions, including spiritual and ritual practices (Fig. 2).

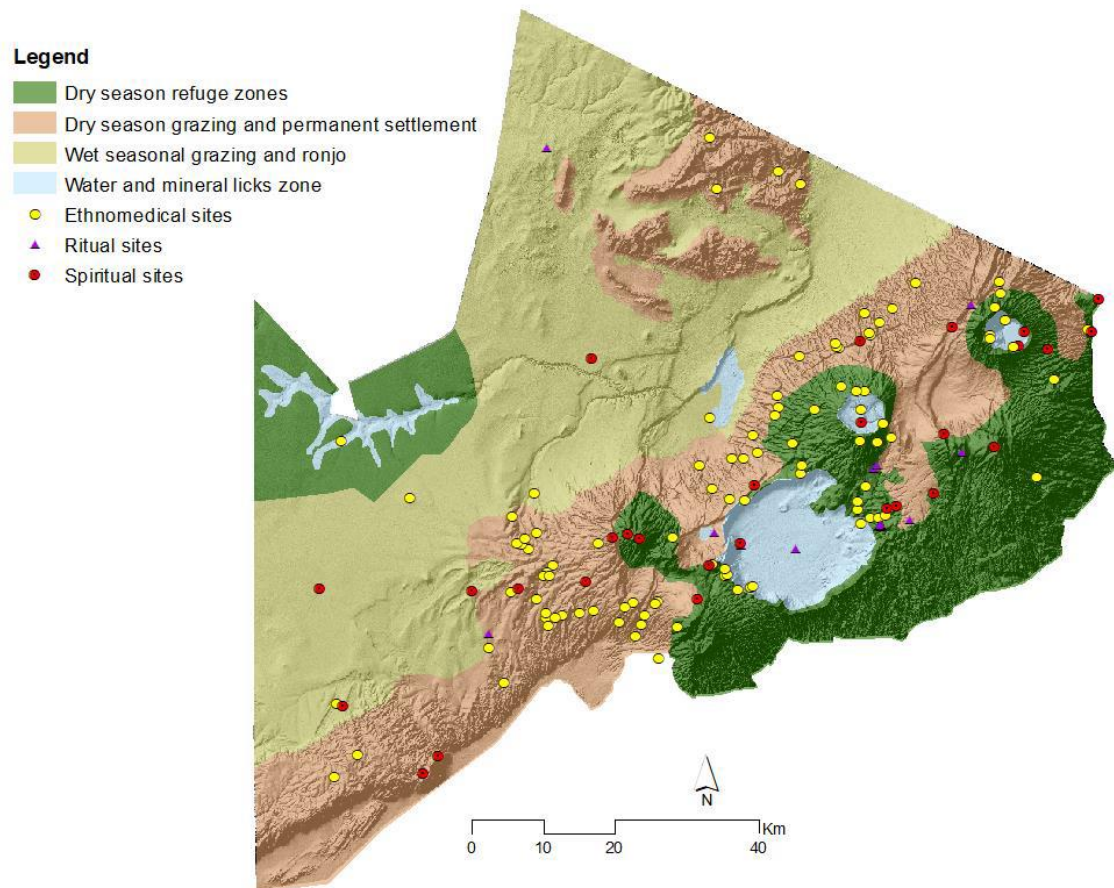


Figure 2-7: Current Maasai land use in NCA (Source-Oleshangai 2022).

The NCA features geological formations that are integral to the livelihoods of Indigenous communities and are appreciated for their remarkable landscapes. Notable geo sites in this area include Mount Oldonyo Lengai, Lake Eyasi, Nasera Rock, Olkarien Gorge, and the Magic Shifting Sand. Maasai communities worship certain natural features in the NCA, including the Magic Shifting Sand, Mount Oldoinyo Lengai, fig trees, and various other geological formations (Mwankunda 2020).

Oldoinyo Lengai Mountain is the major ancestral lands for the Maasai people, which holds religious and spiritual significance to their community (Haule and Njeweale 2021). The mountain is considered the "Mountain of God" and is a site of prayer, fertility rituals, and

healing for the Maasai people (Kannowski & Ngaiza 2022). It is situated next to the NCA, this volcano holds immense religious and spiritual significance for the Maasai community, as they firmly believe that each eruption symbolizes the disapproval of their deities.

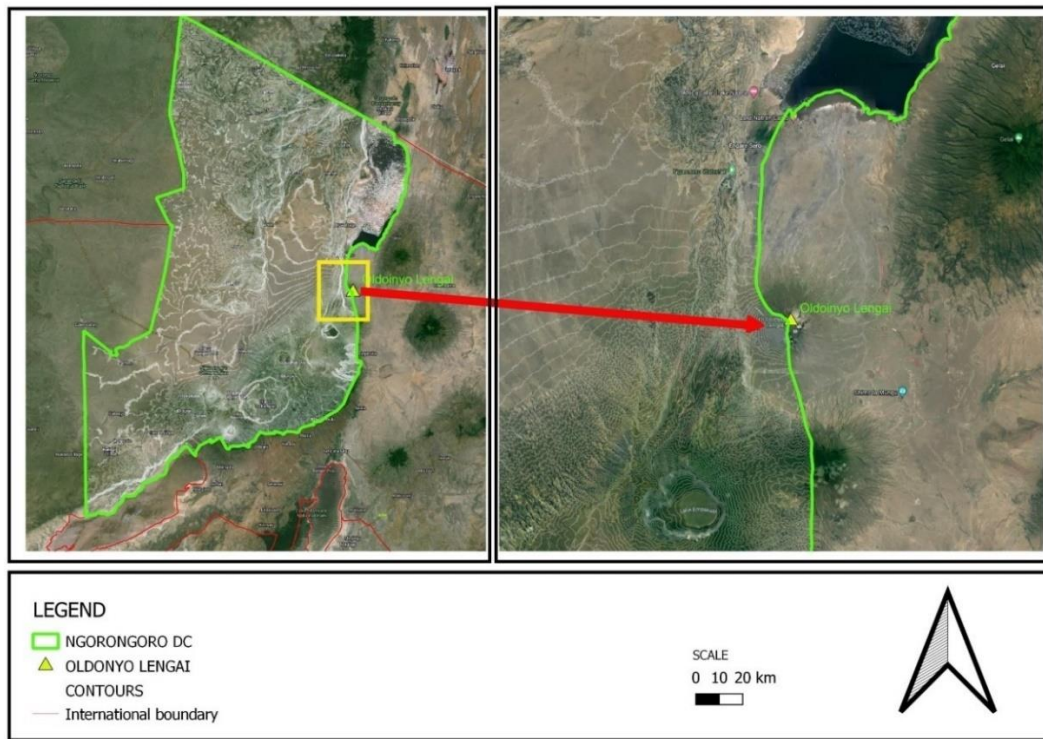


Figure 2-8:Location of Oldonyo Lengai-Source (Author 2024)



Figure 2-9: Oldonyo Lengai Mountain of God, Ngorongoro District

(Source- www.oaklandinstitute.org).

“The Ngorongoro Magic shifting sand which is created by nature, not for specific purpose and in constant movement of 17m – 19m, apart from its aesthetic values, it is also a Maasai sacred monument with rituals practices, a monument of reconciliation and peace making and Maasai believes that where it ends in its movement, it will be the end of the world” (Mwankunda 2020 p.46-47).



Figure 2-10: Magic shifting sand -Source (Mwankunda 2020).



Figure 2-11: Reconciliation Practices at the Magic Shifting Sand Dunes of Ngorongoro- (Mwankunda 2020).

Maasai pastoralists, landscape is not just understood to offer pasture, water and salt licks but known to support multiservice roles including cultural identity, spiritual and ritual functions (Oleshangai; 2022) Therefore, addressing the needs of a community while considering its cultural requirements is significant for the success of a resettlement (Vijekumara and Karunasena 2016). Thus, the aim of this research is to analyze the issues of Maasai community resettlement projects in Tanzania by providing a deeper understanding of cultural issues

stemming from construction professionals, policy makers and government officials working for community resettlement projects following community resettlements.

Few studies have tried to highlight the relationship between the indigenous people with the land in their built environment. Indigenous Peoples like Maasai have a long and collective ancestral relationship to their lands and natural resources. This relationship is grounded in their beliefs, practices, systems of knowledge, and social norms, which in turn are dependent on their physical, cultural, and spiritual well-being and the resilience of the ecosystems in which they live (Estrada et al. 2022). Indigenous sociocultural identities are intricately interwoven with the plant, fungus, and animal species found on Indigenous Peoples' lands (Estrada et al. 2022).

2.5.4 Tourism in Ngorongoro Conservation area

Over the decades, tourism has experienced continued growth and deepening diversification to become one of the fastest growing economic sectors in the world (Kajzar 2014). The tourism industry in Tanzania has experienced rapid growth, with particular emphasis on the northern region. This area is home to popular game parks, such as the Serengeti and Ngorongoro Conservation Area (NCA), which have attracted a significant number of tourists (Snyder and Sulle 2011). Despite contemporary trends toward globalization, the Maasai ethnic group in East Africa has been positioned by the tourism industry as unique and culturally robust. (Salazar 2009).

In Tanzania Maasai ethnic tourism is the second attraction after wildlife (Salazar 2009) . It is known internationally for its unique cultural features, primarily with regard to Maasai culture. Maasai cultural tourism offers visitors the opportunity to engage with the Maasai people and their cultural heritage, including rituals, crafts, ceremonies, and traditional homesteads(Snyder and Sulle 2011). The Maasai people play a crucial role in the tourism sector by contributing to effective environmental stewardship, economic development, social empowerment, and the protection of natural and cultural heritage.

Their involvement supports local culture, tradition, knowledge, and skills, fostering a sense of pride in community heritage (Snyder and Sulle 2011). The Maasai culture's preservation and promotion of traditional art forms and crafts, alongside other ethnic groups, has not only played an important role in preserving their identities but has also been crucial in attracting tourists seeking an authentic cultural experience, making it a significant contributor to the tourism sector in the country (Irando 2004). Cultural tourism gives visitors the opportunity to

understand and appreciate the Essentials character of a place and its culture as a whole, including its History and archeology, People and their lifestyle (including the ways in which they earn a living and enjoy their leisure, Cultural diversity, arts and architecture, Food, wine and other local produce, Social, economic and political structures, Landscape (Zedková 2013).

In most cases tour operators are pushing more and more domestic and foreign travelers to visit cultural bomas so they can explore the unique cultures of the Maasai people (Summitt 2014). To get a glimpse of these unique people and experience their cultures before they vanish, a *large number of western tourists and a small number of domestic travelers seeking an authentic cultural experience* travel to Maasai villages (Snyder and Sulle 2011). The tourism industry in Tanzania has witnessed remarkable expansion and variety, specifically in the northern region and through the celebration of the Maasai people's distinct cultural heritage. The preservation and promotion of traditional art forms and crafts, as well as the inclusion of other ethnic groups, have played a pivotal role in driving the country's tourism sector. This has attracted a multitude of tourists who seek an immersive and genuine cultural encounter (Sharp and Twati 2017).

Despite contemporary trends toward globalization, the Maasai ethnic group in East Africa has been featured by the tourism industry as a distinctive and durable culture (Raout and Chabloz 2009). Cultural Villages are popular attractions for tourists seeking to immerse themselves in the unique architecture and cultural traditions of the Maasai people.



Figure 2-12: Maasai dancing to attract tourism -Source:(Sharp and Twati 2017.



Figure 2-13: Maasai woman showing a tourist the beaded handicrafts –
Source (Antonsen 2019).

2.6 The Maasai

2.6.1 Maasai Historical Background

The Maasai are pastoralists and nomads who belong to the Nilo-Hamitic ethnic group. They are primarily found in the Great Rift Valley and East African Plateau in northern Tanzania and southern Kenya. The Maasai people trace their origins back to North Africa and migrated southwards along the Nile Valley, eventually settling in Northern Kenya in the 15th century. They continued their migration, conquering other tribes along the way, and by the end of the 19th century, they had established their dominance over most of Northern Tanzania and Southern Kenya, relying on their cattle for sustenance and engaging in cattle raids for survival (Albert and Mosha 2020; Kotowicz 2013). As they moved southward, they raided, conquered, and assimilated other tribes into their midst. The Maasai are known for being one of the most traditional and conservative groups in Africa, managing to retain much of their traditional culture. Due to their traditional way of life, attire, and convenient location near Tanzanian and Kenyan game parks, they have become one of the most well-known human tourist destinations in East Africa. The Maasai people inhabited the Serengeti areas for centuries before the establishment of the national park (Kotowicz 2013).

The Maasai community residing in the Ngorongoro Crater were forcibly removed from their ancestral land in the Serengeti, which they referred to as the endless plain. The British colonial administration enacted their eviction in 1959, resulting in the declaration of the area as a national park (Kideghesho 2010). Colonial rule implemented a conservation strategy called "fines and fences," which alienated people from conservation initiatives and led to animosity between the two parties (Kideghesho, Røskaft, and Kaltenborn 2007). The Maasai were then moved to the Ngorongoro area, where they have been ever since they left the Serengeti plain.

The historical presence of the Maasai community in the Serengeti and surrounding regions, characterized by their distinct land use practices such as seasonal movement of livestock between lowlands and highlands in Ngorongoro-Serengeti, has been documented since ancient times (Kotowicz 2013; Oleshangai; 2022). They had a population of approximately 3,000 individuals when they moved to the NCA. They arrived in NCA Landscape and joined a small group of Maasai from the area. Current projections estimate that the Maasai population in the NCA is around 120,000 individuals (Mbise 2022).

2.6.2 Maasai Culture, Custom and Traditions.

Understanding the Concept of Culture

Culture is a broad concept that permeates all facets of human existence and has a significant impact on many facets of daily life (Salazar 2009). A study by Albert et al. (2020) defined culture as the societal customs, myth, ideas and values of the people of a particular place. Culture encompasses the social behaviors, norms, and capabilities that are acquired and transmitted through social learning within human societies. It is a complex and multifaceted concept that includes various elements such as knowledge, beliefs, art, morals, laws, customs, and the habits and identities that individuals develop as members of a particular society (Ikechukwu and Ogbo 2019). "Culture is explained by two connected phenomena: the psychological perspective - what people think (i.e., attitudes, beliefs, ideas and values), and the physical perspectives - what people do (i.e., ways of life, artworks, artefacts and cultural products)" (Ayubu and Cleempoel, 2020, p.2).

"Some aspects of human behavior and social practices are said to be cultural universals, found in all human societies. These include culture-expressive forms such as music, dance, ritual, religion, and technologies such as tool usage, cooking, shelter, and clothing. The concept of material culture covers the physical expressions of culture, such as technology, architecture and

art, whereas the immaterial aspects of culture such as principles of social organization (including practices of social organization, political organization, and social institutions), mythology, philosophy, literature (both written and unwritten), and science, comprise the immaterial/intangible cultural heritage of a society” (Ikechukwu and Ogbo, 2019, p. 13).

The Maasai people have a distinct cultural identity that is deeply rooted in their history, traditions, and way of life (Summitt 2014). They are known for their unique style, bravery, and resilience. Their cultural identity is closely tied to their language, Maa, which is the foundation of their name. According to Albert et al. (2020), cultural identity can be defined as people’s sense of belonging to cultural community, and dwelling process of a place. Due to its importance, culture has been utilized as a lens to examine various facets of human development.

a) Language

The Maasai language, Maa, is primarily an oral language. They have interacted with people from different linguistic and cultural backgrounds, such as Bantu-speaking agriculturists, Nilotic-speaking semi-pastoralists, and pastoralists who speak Cushitic. The Maasai people in some regions speak only Maa and neither English nor Swahili, the national languages of Tanzania.

b) Food

The Maasai people, known for their semi-nomadic lifestyle centered around livestock, rely on milk, meat, and blood for sustenance, but during times of drought, they supplement their diet with agricultural produce obtained through cultivation or trade with nearby farmers (Johanne and Aure 2019).



Figure 2-14: Milk cows in Maasai Knaal -Source (Sharp and Twati 2017).

c) Livelihood

Livestock keeping through the pastoral mode of production, including the seasonal movement of people and cattle known as "transhumance," is the primary means of livelihood for the Maasai residents of NCA. They depend on beekeeping and honey collection as a supplemental source of income; NCAA has recently extended its assistance to these activities (Oleshangai, 2022).

d) Marriage

In Maasai society, polygamy is practiced, allowing a man to have multiple wives. This can result in a girl marrying a man of her age or an older man who has been previously married. Women view having multiple wives as advantageous, as it offers companionship and assistance with household tasks (Sharp and Twati 2017).

e) Religion

The Maasai believe in one God, which they call Engai, and their harmony with nature is closely intertwined with their admiration for God (Barron 2021; Traditions 2013). "Engai is the Supreme God, dwelling on earth, and in heaven. There are two aspects of Engai: the first, Engai Narok, the God of which is Black, is the good and benevolent God; and the second, Engai Nanyokie, the red or avenging God, represents God's holy anger" (Traditions, 2013, p.53).

Example: One of the ancestral lands for the Maasai people is Oldoinyo Lengai Mountain, which holds religious and spiritual significance to their community (Haule and Njewe 2021). The mountain is considered the "Mountain of God" and is a site of prayer, fertility rituals, and healing for the Maasai people. (Kannowski & Ngaiza 2022).

f) Segregation Based on Gender, Age, and Family Structure:

The Maasai society is patriarchal, with men owning livestock and cattle, while women leave their father's home to join their husband's home and take on gender-specific roles. The traditional Maasai homestead consists of segregated living quarters called ekanji, which are constructed based on gender, age, and family structure. Men primarily care for livestock, while women focus on household chores and childcare. However, there is some growing acceptance of sharing work and supporting each other in recent times (Kotowicz 2013). Gender relations play a vital role in livelihood systems as they determine the division of labor within families and households, which particularly affects women in ethnic groups that follow patrilocal marriage and patrilineal inheritance traditions, leading to significant implications for them (Lao and Alton 2004).

g) Maasai traditional clothing and dress “*Ilkarash*”

Most Maasai wear shukas, or sheets, which are usually red or blue in color. The Maasai shuka is distinguished by its primary colors of red and black. Clothing is a significant symbol of identity in Maasai culture. It is used both consciously and unconsciously to manipulate and convey an image, represent group affiliation, and indicate personal and social identity. Examples of this can be found in Maasai clothing, which signifies social position within the Maasai lifecycle, and ethnic group membership (Kotowicz 2013). The way Maasai dress shows the respect of their cultural values (Albert and Mosha 2020). The Maasai typically favor specific colors like red, black, yellow, blue, and green, with each color holding its own meaning as described in the figure 2-10.



Figure 2-15: Maasai Women and Warrior wearing Maasai decorative clothes
-Source (Katowicz 2013).



Figure 2-16:Maasai beadwork decorated with variety of colors and patterns-
Source: (Albert and Mosha 2020)

h) The Significance of Colors in Maasai Culture

Maasai beadwork is a significant cultural practice primarily carried out by women, who view it as their duty to master the craft. The beadwork serves various purposes in community events and rituals, with unmarried women wearing large flat beaded discs around their necks during dances to symbolize grace and flexibility (Semwaiko 2023). Maasai beadwork features various colors, each with its own significance: red symbolizes blood, bravery, and unity; white stands for health, peace, and purity; blue represents the sky and energy; green signifies the land and production; black reflects the people's struggles; yellow symbolizes the sun, fertility, and growth; and orange represents warmth, generosity and friendship (Myung 2023).



Figure 2-17: Significance of colors in Maasai Culture-Source (Albert et el 2020 and Myung 2023)

i) Circumcisions Rituals

Circumcision is a significant rite of passage for both men and women in Maasai culture. Girls get circumcised as they reach adulthood and get ready for marriage, while boys get circumcised when they enter adulthood. However, as female circumcision is acknowledged as a detrimental ritual that requires attention, there are initiatives within the Maasai community to end the practice (Kotowicz 2013).



Figure 2-18:Maasai boys are preparing for circumcision ceremony and after circumcision-
Source (Katowicz 2013; Quinlan et al. 2016)

j) Maasai Burial Traditions

The Maasai believe that death (En-keeya) is caused by Enkai Na-nyokie, the red god who is vengeful and controls life and death. They have no elaborate funeral rituals or belief in life after death, as the body is seen to have no value once life is gone. Traditionally, the Maasai did not bury their dead but left the bodies in the forest to be eaten by wild animals, often smearing them with fat to attract predators. Because of their deep fear of death, anyone close to dying was usually taken away from the enkang (homestead) to die in the bush, keeping death away from the living (Dikirr, 1994).

In some cases, Maasai burial traditions are influenced by Christianity and formal education. When the deceased is Christian, funerals typically follow church practices such as prayers and burial services instead of traditional Maasai rituals. However, such cases remain limited among the community (Barron, 2019).

k) Social structure

The Maasai culture is deeply rooted in a social structure based on age-sets, which influences their clothing, domestic duties, and provides a way to organize time and history. Their decentralized system of government has elected leaders for each age-set, and their villages are politically and geographically independent, yet connected through shared culture and social structure. The Maasai are divided into moieties, clans, and sub-clans(Kotowicz 2013).

2.6.3 Architecture of Maasai Tribe in NCA

The unique design and construction methods of Maasai architecture in the NCA reflect the nomadic lifestyle and cultural traditions of the Maasai people, with the local community developing their own architectural designs for house construction that were influenced by the environment, mobility, and geographical location (Lenku 2019). Their architecture is influenced by their pastoralist way of life, where cattle raising is the main activity. Women construct manyatta houses using materials like mud, grass, wood, and cow dung that is occasionally used with wood ashes to keep termites out (Albert and Mosha 2020).

a) The Maasai Spatial Configuration.

Spatial configuration in Maasai architecture refers to the spatial organization and design of Maasai villages. “The organization and structure of the indigenous Maasai homesteads are influenced by environmental dynamics, folklore (cultural belief, proverbs & stories) semi-nomadic lifestyle, social ties, cultural practices, rituals and symbolic values” (Ayubu and Cleempoel, 2020, p.4). At the core of their culture lies the cherished heart of livestock, deeply influenced by their nomadic lifestyle (Albert and Mosha 2020). Maasai Cultural Villages serve as authentic hubs for sustainable cultural tourism, allowing tourists to fully engage in the vibrant traditions and customs of the Maasai people, while also supporting the community economically and preserving their way of life through the revenue generated. These villages are carefully crafted to cater to the needs of the community, prioritizing the protection and housing of their livestock as an integral part of their cultural identity (Salazar 2009).

To manage land and natural resources effectively, the Maasai use smaller communities called “ngutot/irkung” that are based on territorial occupation and consist of multiple clans. These communities have a well-established system for utilizing pasture, water, and mineral licks. Each “boma”, housing up to 8 male occupants and their families, may have a designated pasture reserve called “alalili” to support vulnerable animals during drought, while other areas around the homesteads can be used throughout the year unless designated as alalili. There is a general reserve designated further out from the homestead, which is typically around 10 kilometers from the village and accessible to all community members during the dry months of the year. Seasonal camps “Ronjo” are permitted to allow efficient pasture usage throughout the time because the reserve may extend hundreds of kilometers from permanent settlement. (Oleshangai; 2022).

b) Homestead organization

To enhance security against carnivores and livestock raids, Maasai homesteads are designed with three concentric layers consisting of a fence, dwelling units, and livestock enclosures. Maasai, permanent homesteads can be classified into two main types based on social-cultural dynamics: the "elit," a single elder homestead preferred by those seeking less social interaction, and the "nkang'itie sapukin," a multiple family homestead where closely related families with strong social-cultural bonds live together in a gradually expanding manner while preserving their cultural traditions (Ayubu and Cleempoel 2020). Domestic settlement size varies based on the number of families and herd size, with cattle holdings per family ranging from 20 to 350. Settlement sizes varies between 20 and 80 meters (Shahack-Gross et al. 2004). The Maasai's unique homestead organization serves to safeguard their livelihoods, mitigate conflicts between settlements and wildlife, and preserve their deep connection to their livestock and way of life.

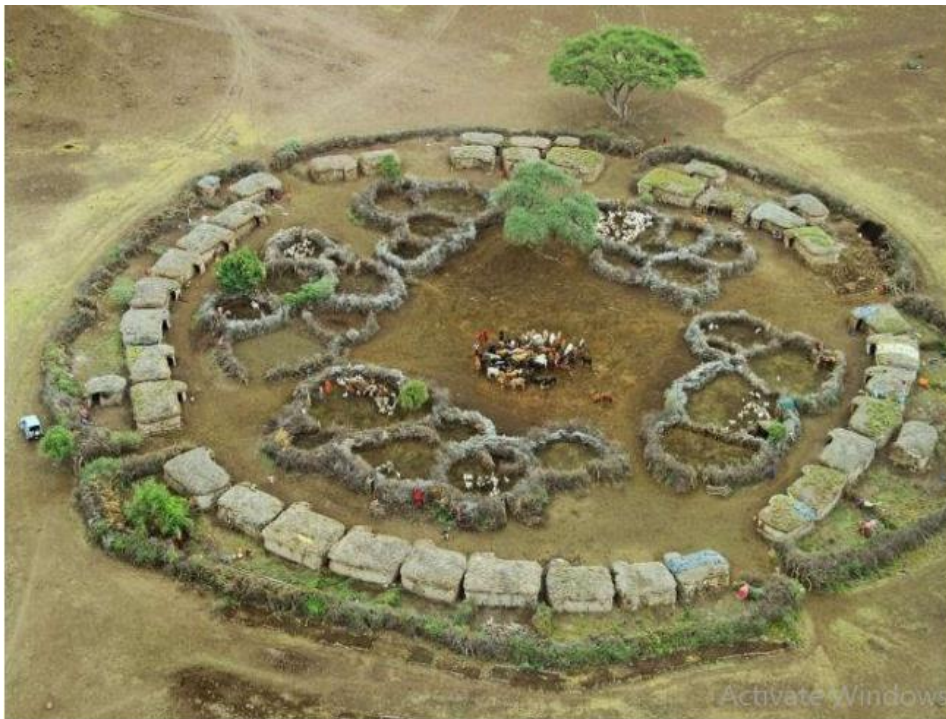


Figure 2-19: A typical Maasai clan- dwelling compound showing house units-
Source: (Albert et al. 2020)

c) Hierarchy

In the Maasai community, there is a strict hierarchy, and each person is held accountable and respected according to their family's profile. Living space is allocated and used based on an individual's age, marital status, sex, and level of wealth. (Mosha 2011). The spatial organization of a domestic settlements follows set rules which reflect social organization, including polygamy, kingship and seniority (Rukwaro and Mukono 2001). Several polygamous extended families, comprising 3 to 12 households and 10 to 50 individuals, cohabit in domestic settlements to share herding labor and protect their livestock (Shahack-Gross et al. 2004). Size of settlement varies according to the number of humans and livestock housed within the settlement (Rapoport 2008). Houses are designed to create a sustainable and adaptable living space that accommodates their mobile lifestyle. The most sacred place for Maasai people is the livestock kraal. From Maasai folklore, its design develops. The focal point, size, and shape all draw attention to it. According to Maasai customs, the diameter of a cattle kraal is three-quarters that of a goat or sheep pen, while a calves' pen is typically one-quarter that of a cattle kraal. These measurements represent the Maasai conception of livestock enclosures (Ayubu and Cleempoel 2020).

d) Maasai Housing style and Forms

The Maasai people live in a traditional dwelling's compounds known as Manyatta. The Manyatta, consists of small, oval-shaped houses delicately constructed by the Maasai people using materials like mud, grass, wood, and cow dung, with women playing a crucial role in their construction (Albert and Mosha 2020; Lenku 2019). Maasai residential compounds begin with a small number of housing units and progressively expand in a hierarchical manner to encircle the cattle kraals that are situated in the middle of the complex (Albert and Mosha 2020).

In Maasai culture, every woman builds her own home. This idea has also been referred to as "the dweller as a designer" elsewhere (Mottaki Zoheir 2013). Maasai women utilize the building of houses as a platform to pass on their knowledge of traditional building techniques an intangible cultural heritage to the next generation. The cow dung home, or "enkaji emodioi," the round thatch house, or "enkaji orkujita," which is adopted from Arusha, and the rectangular thatch house, or "enkaji o lamburui," which is adapted from Mbulu, are the three main forms of indigenous buildings that are often seen in Ngorongoro. It appears that the Ngorongoro terrain is dominated by the round thatch home style (Ayubu and Cleempoel 2020).



Figure 2-20: Maasai cultural boma at Ngorongoro -Source (Mbise 2022).



Figure 2-21: Maasai housing style and form-Source (Mewanu and Nyeko 2024).

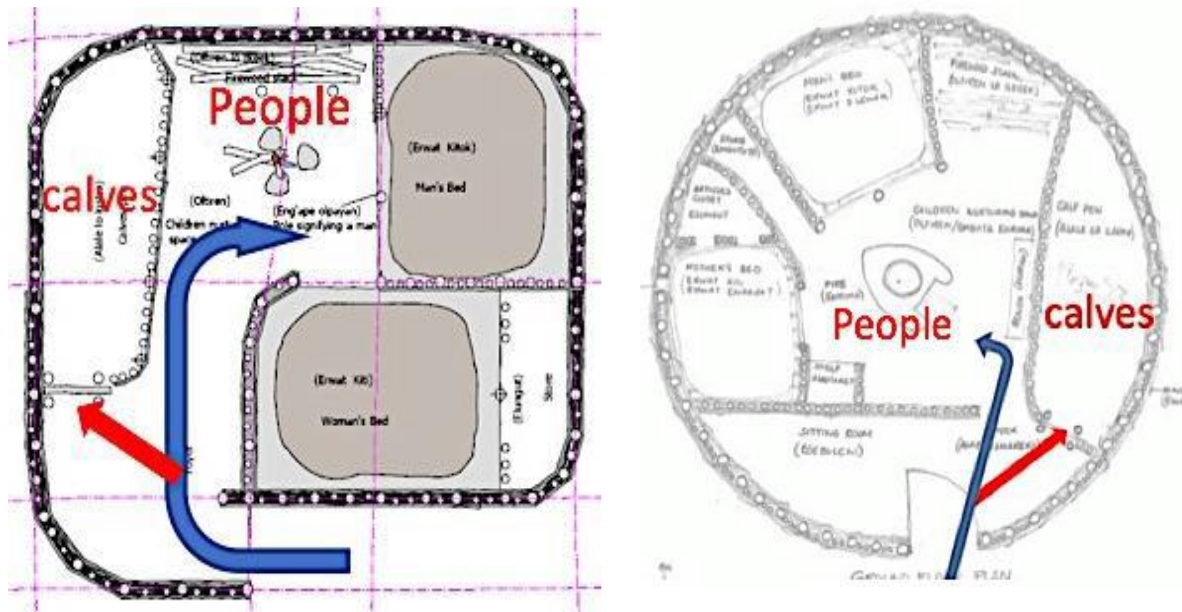


Figure 2-22:Maasai cow dung and round thatch house-Source (Ayubu and Cleempoel 2020)

e) Maasai homestead's spatial requirement

A conventional Maasai homestead comprises several elements, such as a cattle kraal called "boo o nkishu," a calves' pen called "alale lo losho," a goats' and sheep's pen called "emwatata o ndare," a courtyard called "Alamanaa" those functions as a gathering spot for people and animals, a backyard called "kioni" for storing firewood, sticks, ash, and grass, and several living quarters for both humans and livestock, which can change based on the social dynamics within the homestead. Some Maasai homesteads have designated areas for donkeys and sick animals, while the traditional Maasai house includes various functional spaces like an entrance, lobby, animal pens, beds for men and women, storage areas, and shelves (Ayubu and Cleempoel 2020).

f) Building Materials

Maasai housing utilizes locally sourced materials for the floors, walls, and roofs (Fig 2.17). The walls of traditional Maasai houses are constructed by combining mud, sticks, and cow dung, creating a strong and durable structure. Various materials, including grass, sticks, reeds, tin, or any other flat-laying material, are used for the roofs. Cow dung is frequently applied to the roofs to ensure waterproofing. The floors of Maasai houses can be made from compacted earth or covered with a mixture of cow dung and ash. These materials are selected based on their

accessibility, affordability, and compatibility with the local environment and cultural traditions (Lenku 2019).

2.7 Summary of Key Findings of Literature

The literature reviewed in this study examines the housing provision and resettlement process of the Maasai people from Ngorongoro to Msomera. While studies suggest that housing serves not only as a shelter but also as a space for personal security, privacy, and social interaction. Relocation programs fail to consider some significance cultural factors that influence the design of housing. This housing is typically seen as a finished product, neglecting the unique needs, traditions, and cultures of the relocated individuals. Consequently, residents must gradually adapt, modify, and rearrange their living spaces to aid in their process of rebuilding their lives. Therefore, future planning should take these cultural aspects into account to avoid potential pitfalls. The research recommends employing a participatory design approach to effectively address the community's needs during the design and implementation process.

This study reveals that cultural components and values significantly influence housing provision for relocation projects. Future planning should consider how housing issues are addressed within communities.

Numerous studies have sought to tackle the challenges of housing provision; however, solutions often vary from one community to another due to differences in cultural contexts and the characteristics of the built environment. Each community possesses distinct cultural values and elements linked to their housing and overall lifestyle. Similarly, this study focuses on addressing the housing provision challenges faced by the Maasai in the context of their relocation from NCA to Msomera-Tanga.

CHAPTER THREE

3. Research Methodology

3.1 Introduction

The methodology section plays a crucial role in providing a clear and systematic approach to conducting the investigation (Kombo & Tromp 2006). This section outlines the research design, research approaches, geographical area, population description, sampling strategies, data collection methods, data quality control, measurements, and data analysis techniques. These components collectively contribute to the overall reliability and validity of the research outcomes.

3.2 Pre-Field Work

The process of Data collection for this was started during the months of April-June 2024. Research demands oversight to ensure compliance with ethical and procedural guidelines. I needed to secure approval for my research at two separate Locations. The first location is the Arusha Regional Commissioner office to have access to collect data in NCA and the second is Tanga regional Commissioner office to have access to collect data at Msomera which is the resettled zone. From Ngorongoro to Msomera-Handeni Tanga is approximately 600km. Obtaining approval from the RC office is not the final step; you must also inform the relevant authorities in the district and village about my presence and the purpose of my research.

This research has employed two research assistants whereby I told them some of the expectations that I had entering the field, and how to adhere with ethical considerations. This study's ethical considerations include obtaining informed consent from participants, ensuring anonymity to protect their identities, and guaranteeing voluntary participation with the option to withdraw at any time. Furthermore, it emphasizes confidentiality and transparency to foster trust and integrity throughout the research process.

3.3 Field Work

This is a comparative study involving Ngorongoro and Msomera Tanga. The first field work started at NCA for the aim of gaining prior understanding of the cultural shifts, architectural changes, and their impact on the Maasai community-built environment and heritage on resettlement from Ngorongoro to Msomera Handeni Tanga. This is a distinct area where one can gain a thorough understanding of Maasai characteristics and customs. Data were gathered from specific wards and villages of households that were hesitant to relocate from the NCA. The selected wards included Alailai, Irkeepusi, Misigiyo, Ngoile, and Nainokanoka. Collecting data in the NCA posed significant challenges due to the residents' concerns that we were collecting information to support what they referred to as eviction and the forced departure from their ancestral lands.



Figure 3-1: Field work at NCA Source: (Author 2024)

The second fieldwork is at Msomera Tanga which is the resettled zone for Maasai. This is a core area of this study on understanding of the cultural shifts, architectural changes, and their impact on the Maasai community-built environment and heritage. Most of the data were collected through interviews, physical observation, group discussion, site sketches and photographs.



Figure 3-2: Field work at Msomera- Tanga-Source: (Author, 2024)

3.4 Research Design

“A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure” Kothari (2004.p 31). A research design ensures a cohesive and focused approach to data collection, ensuring that the gathered information directly addresses the research questions and aligns with the study's objectives. The research aims to explore housing provisions during the resettlement of the Maasai from Ngorongoro to Msomera-Tanga, focusing on cultural shifts, architectural changes, and their effects on the community’s-built environment and cultural heritage. It involves collecting data from the Maasai people who have decided to remain in NCA as well as those who were resettled to Msomera from Ngorongoro (Manatunge and Abeysinghe 2017).

This research intended to follow a “Case study Method”. Case study is defined as “an empirical inquiry that investigates a contemporary phenomenon (the ‘case’) in depth and within its real-world context” (Hollweck 2015.p.109). It entails a detailed and intensive analysis of a particular event, situation, organization or social unit. A case generally encompasses a specific space and time frame, representing a phenomenon within a clearly defined context. A case can be an individual, a role, a small group, an organization, a community, or even a nation (Acquah, Annan, and Sackey 2022; Schoch 2009). It can be used to investigate a case's surrounding circumstances and convey the complexity of a case, including temporal changes (Hollweck 2015). The purpose of a case study is to gain an in-depth understanding of a specific situation, focusing on a particular individual, program, or event over a defined period (Pacho 2015).

Justification for the choice of “Case study research design” is because the resettlement of the Maasai people from Ngorongoro to Msomera-Tanga is a unique case that can be thoroughly investigated using the case study method. The case study method provides a suitable framework for conducting an in-depth investigation into the architectural cultural changes in terms of traditional architectural values of the Maasai tribe's resettlement. “One may think of depth as referring to the detail, richness, completeness, wholeness, or degree of variance that is accounted for by an explanation” (Pacho 2015, p.45). It allows for a comprehensive analysis of the specific case, the perspectives of the Maasai people, and the broader context of the resettlement process.

3.5 Research Approaches

This study has employed a mixed-methods approach, combining qualitative and quantitative research methods.

3.5.1 Qualitative research method

‘In a broad term, qualitative research is an approach that allows you to examine people’s experiences in detail by using a specific set of research methods such as in-depth interviews, focus group discussions, observation, content analysis, visual methods, and life histories and biographies’ (Hennink 2020, p. 10). Through qualitative methods such as in-depth interviews, focus groups, observation have been used to gather in-depth insights from the Maasai community members who have been resettled and other relevant stakeholders.

In-depth interviews

This method collected personal narratives and experiences related to the traditional cultural values of the Maasai, as well as insights into how these values influence architectural choices and housing design. The interviews captured perspectives on the design process of housing in Msomera. The data was sourced from a diverse group, including Maasai elders, spiritual leaders, knowledgeable households, the project manager from NCA, town planners appointed by the Ministry of Natural Resources and Tourism, and local and international tourists, including tour guides.

Focus group discussions

Focus group discussions gathered collective views on the significance of traditional cultural values among the Maasai community. Participants engaged in group analysis to explore how these values are reflected in Maasai architecture and brainstormed ideas for integrating cultural values into the resettlement project. The discussions involved diverse groups of Maasai community members, including women who serve as master builders and youth, ensuring a range of perspectives and insights.

Observations

This involved direct observations of the architectural styles and materials used in Maasai homesteads, including construction techniques, homestead organization, and the hierarchy of communal spaces. Cultural practices during community events or ceremonies that reflect traditional values was noted. The observations also encompassed the environmental context and spatial organization of housing in Msomera, focusing on various sites such as homesteads, communal areas, ritual sites, and ceremonial locations within the Maasai community.

Photography

Photography was used as a data collection method to visually document key elements of Maasai culture and architecture. The researcher employed a digital camera to capture traditional architecture and community life, including images of cultural ceremonies, rituals, and daily activities that highlight the community's values. Photographs of housing designs and materials further reflected the influence of these cultural practices, enriching the qualitative data collected from the community

The physical survey and transect walk

The physical survey and transect walk provided deeper insights into the existing conditions of the study area. By walking through the neighborhood of Msomera, the researcher uncovered valuable issues that complemented the findings from other methods, such as interviews and group discussions.

3.5.2 Quantitative research method

Quantitative research involves measuring phenomena in numerical terms, making it applicable to situations that can be expressed in quantities (Kothari 2004). This research has also employed

this phenomenon to allow for the collection of quantitative data. Data, including demographic information and the number of houses built, were collected through surveys conducted among members of the Maasai community. Satellite imagery and ArcGIS software were utilized to estimate and compare the variations in areas and percentages of water features, vegetation changes, and bare land between the two regions of Ngorongoro and Msomera in Tanga.

3.6 Description of the Research area

This is a comparative study which aims to explore how spatial dynamics and land use contribute to cultural transformations among the Maasai Community during their resettlement from Ngorongoro to Msomera- Handeni Tanga, with a focus on the case study areas of Ngorongoro Conservation and Msomera-Handeni Tanga.

3.6.1 Ngorongoro Conservation area

The NCA is about 147 kilometers from Arusha City in the Arusha Region. It is found in northern Tanzania, positioned at a latitude of 2.5° and 3.6° S and between longitudes 34.0° and 36.0° E with an area coverage of 8,283 km² (Mwabumba et al. 2022). NCA experiences an annual mean temperature of about 14°C, with relative humidity ranging between 61–78%. The annual precipitation averages 626–1000 mm, and cloud cover varies from 68–79% throughout the year. The Ngorongoro Division, part of the Ngorongoro District, has 11 wards and 25 villages. Geographically, the NCA is bounded to the west by the Maswa Game Reserve and Serengeti National Park, to the south by Karatu District, to the north by the Loliondo and Sale Divisions, and to the east by the Longido and Monduli Districts (Fig. 11). The diverse geographical features of its location, including subsurface streams, woodland, open grasslands, highland forests, and mineral licks, attract a wide range of wildlife throughout the year and sustain the livelihood practices of local pastoralists (Oleshangai; 2022).

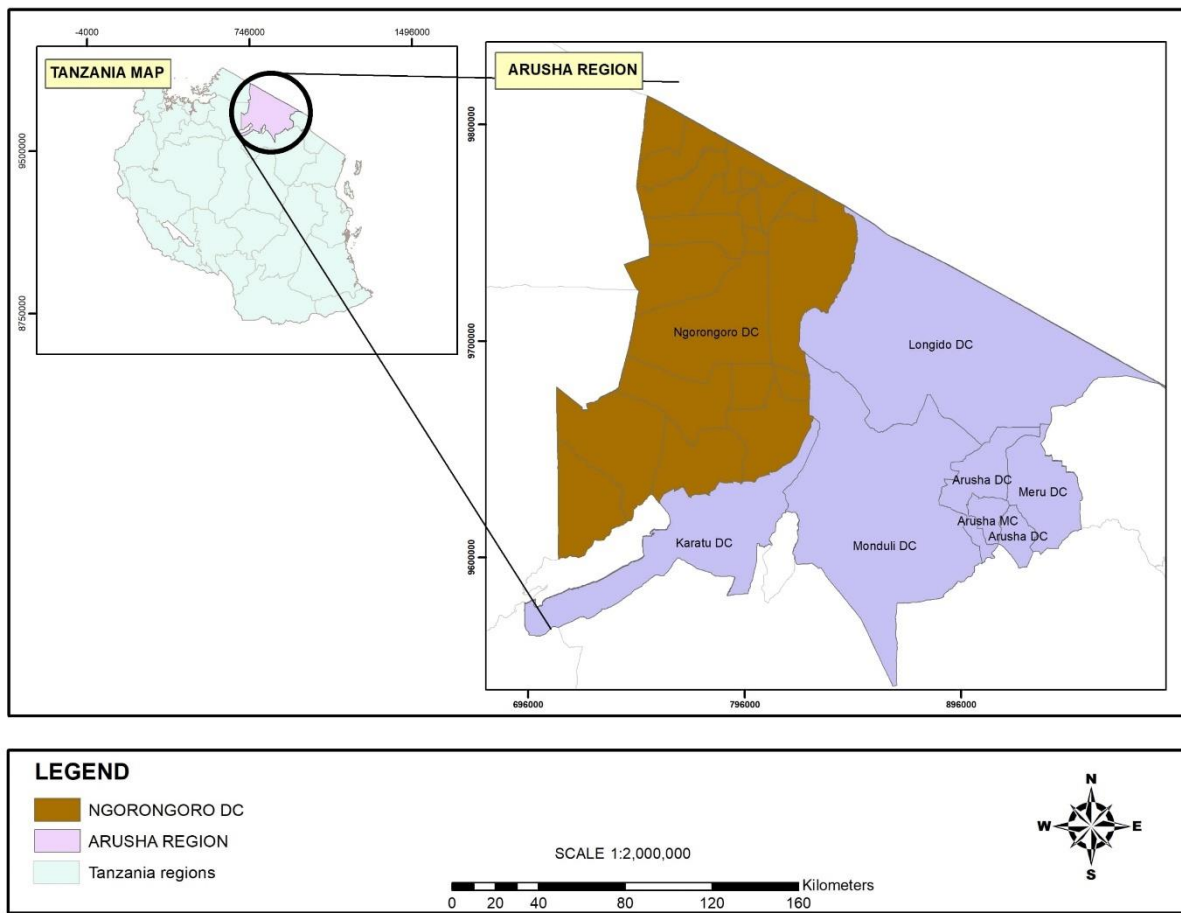


Figure 3-3: Location of Ngorongoro Conservation Area-Source: (Author 2024)

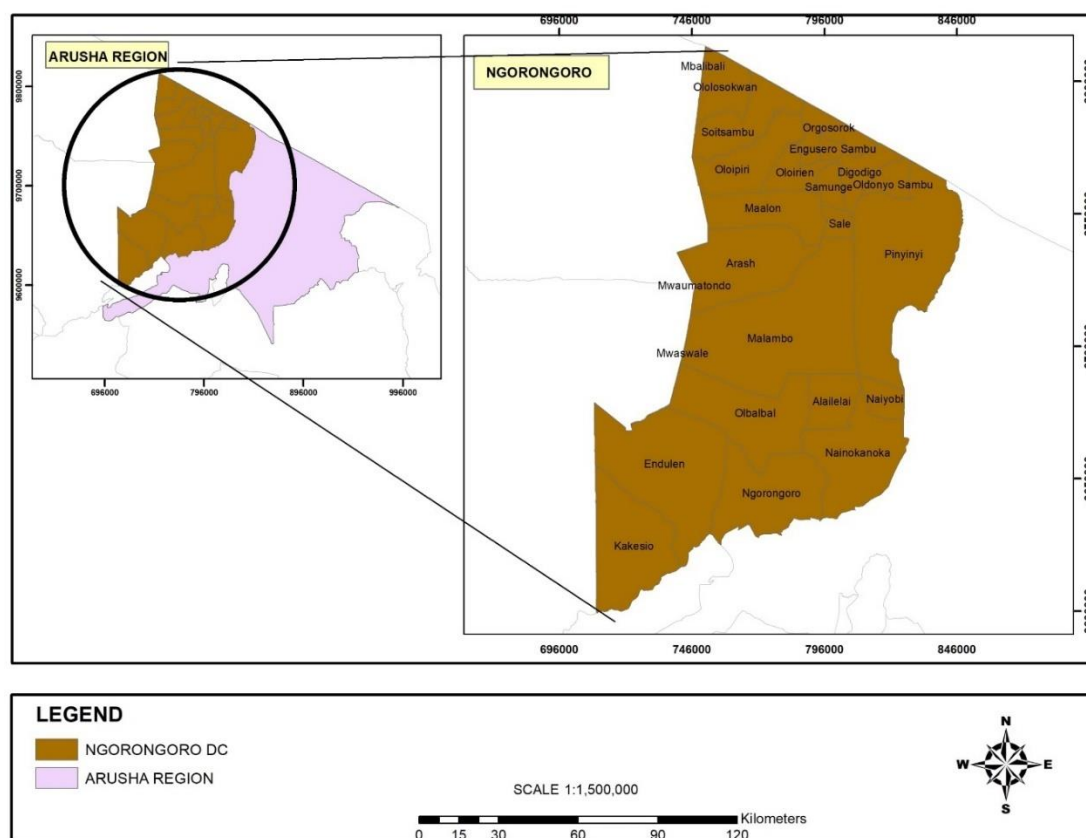


Figure 3-4: Location of Ngorongoro DC and Wards-Source (Author 2024)

The Ngorongoro Conservation Area (NCA) is a UNESCO World Heritage Site which holds a Category V classification by the IUCN, signifying its significant ecological, biological, cultural, and scenic value shaped by long-term human-nature interaction. The unique multiple land-use status of the area ensures the conservation and protection of its remarkable features, allowing for a harmonious coexistence between the Maasai tribe and wildlife, making it distinct among East Africa's protected areas (Galvin et al. 2008). According to current projections, the Maasai population on the Ngorongoro landscape is approximately 120,000 people (Mbise 2022).

3.6.2 Msomera -Handeni Tanga

The study was conducted in Msomera-Handeni District, a district within the Tanga Region of Tanzania. This is the area where Maasai people have been resettled from Ngorongoro. The district is situated between latitude of 05° 00' 00''S and 05° 30' 00''S and longitude of 38° 00'

00''E. Msomera experiences an annual mean temperature of about 26°C, with an average humidity of 79% and annual precipitation of approximately 1,220 mm.

It is more than 600 kilometers away from the NCA (Bernd Kannowski & Cecilia Ngaiza 2022). The region is bordered by Kilindi District to the west, Korogwe District to the north, Pangani District to the east, and Pwani Region to the south (Msambichaka and Onyango 2019).

Handeni district, located in Tanzania's Tanga Region, covers an area of 6,534 km² and has Mkata town as its administrative capital. It is one of the 11 districts that make up the Tanga Region. Msomera village, situated in the Misima ward of the district, is predominantly inhabited by the Maasai and Zigua tribes, with the Maasai, particularly the Kisongo and Parakuya sub-tribes, accounting for approximately 90 percent of the population engaged in pastoralism. The Zigua and Sambia tribes make up the remaining 10 percent of the population in Msomera (Oakland Institute 2022). There are now 8,900 people living in the village.

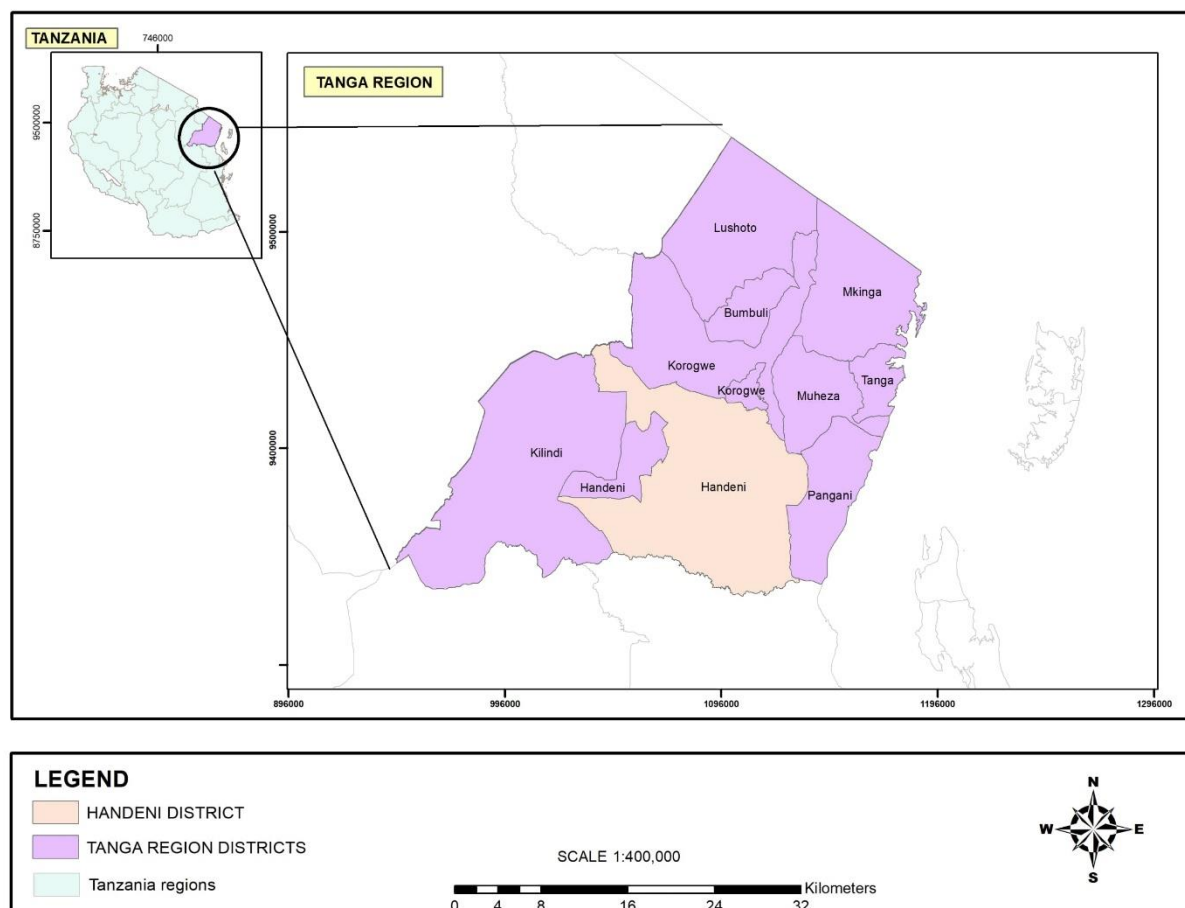


Figure 3-5:Location of Tanga region-source (Author 2024)

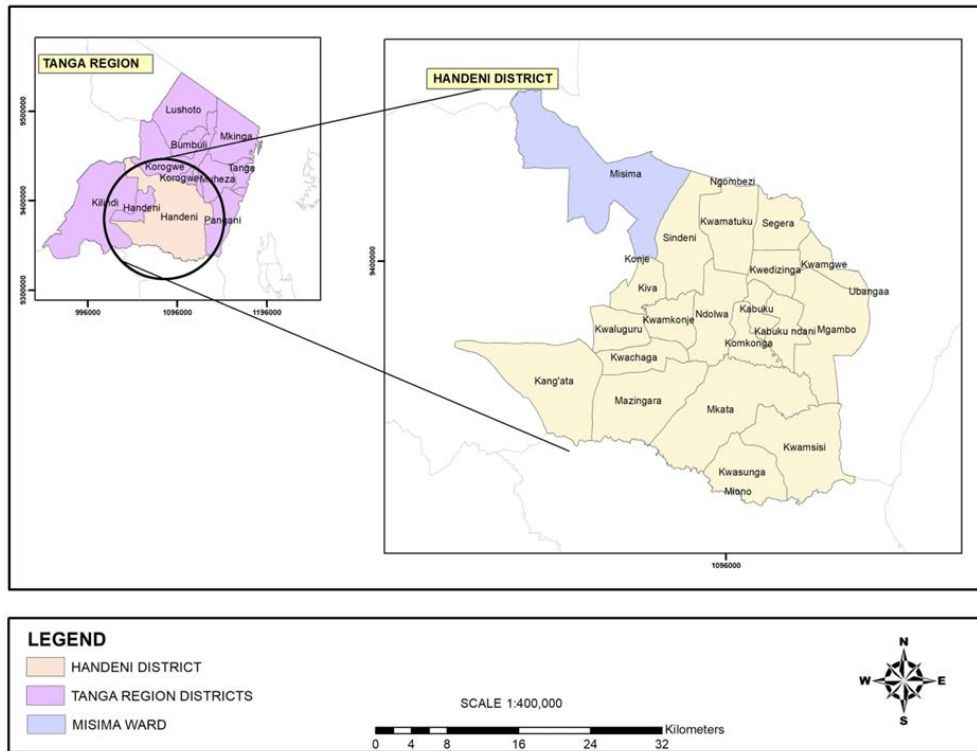


Figure 3-6: Location of Misima Ward where Msomera is situated-Source (Author 2024)

3.6.3 Mitigation Measures for Climate Differences between Ngorongoro and Msomera

Since Ngorongoro and Msomera experience different climatic conditions-Ngorongoro being cool and highland while Msomera is hot and lowland-specific adjustments were made in the research to account for these variations. Climatic data for Ngorongoro and Msomera, including temperature, humidity, and rainfall, were obtained from reviewed literature and official meteorological reports to ensure reliability and relevance to the study areas. The climatic data from both areas were obtained and analyzed to ensure that the comparison of housing comfort considered temperature, humidity, and rainfall variations.

3.7 Population Description

The target population for the study were those within the selected case studies of NCA and Msomera Handeni Tanga. Firstly, it included the Maasai individuals and families who have been relocated, as well as the local communities in Msomera-Handeni Tanga who are affected by the resettlement. The relocation of the Maasai from Ngorongoro to Msomera involved voluntary participation from heads of households and their dependents, as reported by the Tanzania census in 2017. The resettlement specifically targeted the Maasai, Datoga, and Hadzabe tribes, totaling approximately 20,000 households and 115,000 individuals. As of 1st June 2024, research indicates that 1,313 households, accounting for 89% of those relocated, have moved to Msomera, while 141 households (10.8%) were relocated to other areas, including Kitwai and Saunysi.

3.8 Sample size selection

“Sample size refers to the number of items to be selected from the universe to constitute a sample. The size of sample should neither be excessively large, nor too small. It should be optimum. An optimum sample is one that fulfills the requirements of efficiency, representativeness, reliability, and flexibility” (Kothari, 2004.p.56). The main aim of sampling for a qualitative researcher is to gather particular instances, occurrences, or behaviors that can enhance the researcher's comprehension and insight into the phenomenon being investigated.

For this case the study population is stratified in the following category: Maasai Community and spiritual Leaders (custodians of Maasai traditions and rituals), NCA Wildlife officers including (project Manager, Town planner, Architect and Engineer) appointed by Ministry of Natural resources and Tourism, Ward Extension Officers and Tourists. Number of respondents selected was based on age, gender, leadership position in the household and society level and willingness to answer questions. This research utilized both purposive sampling and simple random methods to gather a total sample of 124 respondents (Table 3.1). Specifically, 11 respondents from NCA and 6 from Msomera were chosen through purposive sampling for their relevant expertise. Ten (10) tourists were interviewed at NCA. Additionally, 50 respondents were selected inclusive of Four (4) FGD of 5 people each to represent households at NCA, while 47 respondents inclusive of three (3) FGD households were represented in Msomera.

A sample of 124 respondents was selected based on the fact that qualitative research method is not concerned and seldom draw a huge sample from the studied population (especially in respect to a case study). Flick (2009) suggested that participants in a qualitative study are chosen not for their ability to represent the broader population, which raises concerns about generalizability, but rather for their significance to the specific research topic. Ishak et al. (2014) emphasized that because the findings from qualitative studies cannot be generalized to a larger population, qualitative researchers are not required to undergo the rigorous randomization processes typically associated with sampling procedures. In this case qualitative research is not focused on generalizing findings to a larger population, qualitative researchers are not required to go through the rigorous process of randomization in their sampling procedures. Instead, they can choose participants based on specific characteristics that are relevant to the study objective.

Furthermore, to reach the saturation point of results, mixed methods of data collections were in this study such FGD, Physical observation and Site survey. This helped to add more data to reach a point where no more information is required for each specific objective. Saturation refers to the point in qualitative research where asking additional questions to respondents yields no new information, indicating that sufficient data has been collected for the study(Saunders et al. 2018)

Table 3-1: Sample size selection

SN	Category	Sample size	Sampling Technique to be used	Research method used
	At Ngorongoro Conservation area (NCA)			
01	Maasai Community and spiritual Leaders (custodians of Maasai traditions and rituals).	6	Purposive sampling	Qualitative method
02	Maasai Households: One (1) woman (identified as a master builder and one (1) man (the head of the family) from each selected household.	50	Purposive sampling	Qualitative method

03	Three (3) officers from NCA-Appointed by Ministry of Natural Resources and Tourism (Architect, Town planner and Engineer)	03	Purposive sampling	Qualitative method
04	Two (2) Officers from NCA including relocation project Manager.	02	Purposive sampling	Qualitative method
05	Local and international tourists including tour guides.	10	Purposive sampling	Qualitative method
	At Msomera			
01	Four (4) Spiritual leaders selected at Msomera	4	Purposive sampling	Qualitative method
02	Two (2) Officers at village level (Ward extension officer)	2	Purposive sampling	Qualitative method
03	Maasai Households: One (1) woman (identified as a master builder and one (1) man (the head of the family) from each selected household.	47	Purposive sampling	Qualitative method
	Total	124		

3.9 Sampling techniques and procedures

To mitigate researcher, bias purposive sampling methods was employed. The study used “Purposive sampling” for key informants of selected cases of this study. Key informants are observant, reflective members of the community of interest who know much about the culture and are both able and willing to share their knowledge (Tongco 2007). Purposive sampling is a non-probability sampling method in which participants are selected based on specific characteristics of the population and the objectives of the study. It is also known as judgmental, accidental, availability selective, per quota or subjective sampling (Masupa 2020;

Ndikubwimana 2020). Purposive sampling involves the selection of a sample with a particular purpose in mind and the researcher concentrates on people with particular characteristics who are better positioned to facilitate the success of a study (Uwitije 2016).

Purposive sampling is useful for case study in three situations: (1) when a researcher wants to select unique cases that are especially informative, (2) when a researcher would like to select members of a difficult-to-reach, specialized population, and (3) when a researcher wants to identify particular types of cases for in-depth investigation (Ishak, Yazid, and Bakar 2014). Consequently, the individuals chosen to participate in the study must possess attributes that align with the objectives of the research. Purposive sampling may be more appropriate hence the goal of the study is to understand the experiences and perspectives of the Maasai community directly affected by the resettlement. The study also aimed to gather insights from a broader range of individuals selected. This is done as a way of spreading out the sample and ensuring equal representation of all households and cover all 124 households at Msomera.

3.10 Data collection methods

Researchers have increasingly focused on "mixed methods research," which involves the utilization of both quantitative and qualitative research methods, techniques, and approaches within a single study(Whitehead and Day 2015). This can allow the researcher to collect broad information.

3.11 Data collection instruments/tools

Data collection instruments refer to the methods researchers use to gather data for a study. In a single study, qualitative researchers frequently employ various types of data to enhance the quality of their research. Qualitative researchers utilize a wide range of data sources, including observations, interviews, written documents, audio-visual materials, electronic documents, and other relevant sources to address their research inquiries(Pacho 2015). Principal sources of data for this study included In-depth Interview Guide, Focus Group Discussion, Observation, Physical Site survey and measurements.

3.11.1 In-depth Interview Guide

This study utilized an in-depth interview guide to collect qualitative data on several key aspects related to Maasai housing. In-depth interviewing is a qualitative research technique that involves intensive individual interviews with a small number of respondents to explore their perspectives on a specific idea, program, or situation (Boyce and Neale 2006). In-depth interviews offer a significant advantage by providing more detailed information compared to other data collection methods like surveys. In qualitative research, exploratory interviews are conducted to gain a comprehensive understanding of topics with limited knowledge, by delving into the respondent's perceptions (Arthur 2018).

The study gathered insights into the traditional architectural features of Maasai housing and compared them to modern designs in Msomera-Tanga. It explored how traditional Maasai cultural values influenced housing architecture, examined the design processes used in housing development to meet community needs, and sought perspectives on integrating these cultural values to enhance the resettlement project through culturally sensitive design practices.

3.11.2 Focus Group Discussion Guide

This method has also been ideal for data collection. Focus groups are a qualitative research method where a selected group of individuals is asked structured questions about their personal views, experiences, ideas, and behaviors regarding specific products or services (Abumere 2014). The researcher organized a group discussion, guiding the research while targeting small groups of no more than five selected informants per focus group. The discussion was guided by questions with a view to solicit for the street Maasai community's perceptions, knowledge and experiences, practices shared in the course of interactions with different small groups. The above parameters were integrated through the use of guided questions during the group discussions.

3.11.3 Observation

Data was collected in Ngorongoro and Msomera using observational methods, which Kothari (2004) classifies into two types: non-participant direct observations (e.g., scorecards and behavioral scales) and participant observations (utilizing photography, recordings, and interactions). Participant observation offers several advantages, as noted by Pacho (2015): it increases study validity by providing context, enhances data quality during fieldwork, and

improves data interpretation. This involved direct observations of Maasai homesteads regarding architectural styles, materials, construction techniques, and communal space hierarchy, as well as cultural practices during events. The observations also covered the environmental context and spatial organization of housing in Msomera, including homesteads, communal areas, ritual sites, and ceremonial locations

3.11.4 Physical Site Survey

This was used to give deeper insight and understanding of existing situation and conditions of the study areas. This was applied by conducting on-site observations and measurements of the physical structures and buildings in both locations. This involved documenting the architectural styles, materials used, and spatial arrangements of the Maasai settlements in both areas.

3.11.5 Remote Sensing (RS) Satellite Imagery

Remote Sensing (RS) is the science of identifying features on the Earth's surface and estimating their geo-biophysical properties by using electromagnetic radiation as a medium for interaction. This approach utilizes Landsat satellite (Landsat 8 OLI/TIRS) to capture images. These satellite images were used to measure the reflectance or radiance of the surface of the land at different wavelength, to identify Land Use (LU) (Roy, Behera, and Srivastav 2017).

3.11.6 Aeronautical Reconnaissance Coverage Geographic Information System pro (ArcGIS Pro)

This is a computer-based system designed to capture, store, and display geographical information about the Earth's surface. The ArcGIS 10.8 is employed to visualize various types of land cover based on their spatial patterns and surface characteristics. The land cover categories include vegetation, bare land, soil brightness water bodies, and wetland areas. (Napieralski et al. 2013).

3.12 Research Variables

Table 3-2 Provides a summary of the research variables derived from the research objectives, showcasing the various data sources, methods, tools, and expected results employed to answer the research questions.

Table 3-2: Research variables, research objectives, methods and tools that will be employed to answer the research questions

Research Objectives	Variables	Source of Data	Method	Tools	Expected Result/Output
1. To identify the traditional architectural values of Maasai housing following their resettlement from Ngorongoro to Msomera-Tanga.	Maasai traditional cultural values • The Herth “Orupie” • Privacy (spaces for ritual functions and Perception on use of toilets) • Polygamy structure • Courtyard, Security • Orientation of Maasai homestead “boma”	• Maasai community elders and spiritual leaders. • Maasai head of Households and family members. • Fields studies and observation. • Documented Literature (Books, Journals, Articles, Reports)	• Participatory observation • In-depth-Interviews guide • Focus Group Discussions • Site Survey	• Field sketching • Photography (Camera) • Voice recordings • GPS • Tape measure	• An in-depth understanding of the unique architectural attributes and cultural significance of traditional Maasai housing.

Research Objectives	Variables	Source of Data	Method	Tools	Expected Result/Output
	• Housing style and form • Use of local building Materials • Maasai patriarchal structure • Adaptation to new environment • Maasai coexistence with wildlife • • Spiritual sites • Pastoralism Life style ✓ Livestock enclosure ✓ Glazing land for pasture				

Research Objectives	Variables	Source of Data	Method	Tools	Expected Result/Output
	✓ Water sources ✓ Saltlicks ✓ Reserved glazing area away from home “Ronjo” (about 10km) ✓ Reserved glazing area nearby home “Alalili” ✓ Unrestricted glazing area surrounding homestead				
2. To analyze how the traditional Maasai cultural values influence Maasai housing.	The influence of traditional values in Maasai housing architecture.	• Maasai community elders and spiritual leaders. • Maasai head of Households and family members.	• In-depth-Interviews guide • Field Survey	• Voice recordings • Tape measure • Books	• An in-depth analysis of how traditional Maasai cultural values impact the housing

Research Objectives	Variables	Source of Data	Method	Tools	Expected Result/Output
architecture in Msomera-Tanga.		• Fields studies and observation. • Documented Literature (Books, Journals, Articles, Reports) • Remote Sensing • ArcGIS	• Review of relevant documented literature.	• Journals • Articles • Reports	design in Msomera
3. To analyze the approach used in the design process of Modern housing provided at Msomera.	Approach used in the design process of housing.	• Government Officials: ✓ Project Manager of relocation project. ✓ Professionals:(Architect, Civil Engineer, Town planner, Land surveyor) • Maasai households' leaders and family members at Msomera. • Ward extension offices	• In-depth-Interviews • Participatory observation • Focus Group Discussions	• Voice recordings • Photography (Camera)	• A comprehensive understanding of the design methodologies employed in modern housing at Msomera

Research Objectives	Variables	Source of Data	Method	Tools	Expected Result/Output
4. To identify ways in which traditional Maasai cultural values can be integrated to positively influence future Maasai housing resettlement projects in Tanzania.	Ways to positively influence the resettlement project	• Maasai community elders and spiritual leaders. • Maasai head of Households and family members. • Documented literature (Books, Journals, Articles, Reports)	• In-depth Interviews • Participatory observation • Focus Group Discussions • Field Survey • Review of relevant documented literature.	• Voice recordings • Review of relevant documented literature.	• Gaining insights into how traditional Maasai cultural values can be integrated into the housing resettlement project at Msomera. • Policymakers informed with insights into the challenges and opportunities of such relocations.

3.13 Data quality control

3.13.1 Reliability and validity of instruments

Reliability and validity are important considerations in research methodology, particularly when it comes to the instruments used to collect data. Validity and Reliability of Research instruments are the appropriate measures of truth and accuracy of the tools used in quantitative and qualitative data collection.

3.13.1.1. Validity

According to Husain Bhat Singh (2015), validity is the extent to which a measuring instrument measures what it claims to measure. It refers to whether an instrument accurately measures the trait, characteristic, or quality for which it is intended. It is concerned with the integrity of the conclusions that are generated from a piece of research (Pacho 2015). Validity also refers to the precision in which the findings accurately reflect the data (Noble and Smith 2015).

To assure validity, the study employed several techniques, including purposive sampling and the use of diverse data collection methods. Purposive sampling involves selecting knowledgeable individuals who have relevant insights about the Maasai culture and resettlement issues. This method enhances validity by ensuring that the data collected comes from participants who can provide informed perspectives, thereby increasing the credibility of the findings. Furthermore, the research utilizes multiple data collection techniques, such as interviews, group discussions, observations, and site surveys. This triangulation of methods allows for a more comprehensive understanding of the Maasai's traditional cultural values and their influence on architecture

3.13.1.2. Reliability

Evaluating study reliability entails researchers and health professionals making judgments about the research's soundness, including the appropriateness of methods used and the integrity of the final conclusions. Qualitative research often faces criticism for its perceived lack of scientific rigor, including inadequate justification for chosen methods, lack of transparency in analysis, and the potential for researcher bias in the reported findings (Noble and Smith 2015).

“Reliability is the tendency of a respondent to respond in the same or in a similar manner to an identical or a near identical question (Hussain Bhat and Singh 2015). Conversely, reliability refers to the degree to which a procedure gives consistent results (Pacho 2015).

In other words, if a research study has high levels of reliability, other researchers should be able to generate the same results using the same research methods under similar conditions. Noble and Smith (2015) describe reliability as “the consistency of analytical procedures, taking into account personal and research method biases that may have influenced the findings. Reliability problems can arise in various forms, especially when a single observer is the source of data. Subjectivity can compromise the reliability of the work.

Reliability in this study was ensured through the use of multiple data collection methods (interviews, focus group discussions, photography, physical surveys, and ArcGIS analysis) which allowed for triangulation of data, thereby enhancing the validity of the findings by corroborating information from different sources and perspectives.

3.14 Data analysis Techniques

This study utilized a mixed-methods approach, integrating both qualitative and quantitative research methods. The following techniques were employed in the study.

3.14.1 Analysis of respondents' narratives

Data were analyzed by using thematic analysis of respondents' narratives to identify key themes about the Maasai's resettlement experiences. This method revealed how their traditional cultural values and architectural preferences shape their views on housing in Msomera-Tanga, highlighting the community's needs and challenges.

3.14.2 ArcGIS Pro software

This self-sufficient ArcGIS system is used to analyze complex data and interpret it into meaningful information, including data captured and stored by the system itself, as well as data collected from remote sensing (Chioma, 2022).

3.15 Limitations / Anticipated Problems

3.15.1 Language and cultural barriers

In order to avoid Language and cultural barriers, the study employed a research assistant for language interpretation. This individual had the language skills and Maasai cultural knowledge to bridge the communication gap and ensure accurate data collection. The Maasai people have their own distinct language and cultural practices, which may require the researcher to have a deep understanding of their customs and traditions to effectively communicate and gather accurate information.

3.15.2 Political and social sensitivities

The resettlement of Maasai from Ngorongoro to Msomera has brought controversy and debate politically and socially in sensitive way. This makes difficult during data collection. Some of the People in Ngorongoro who choose to remain there were inferior for interviews fearing the research intending to come with the decision to force them to relocate to Msomera. But thin concern was elaborated to the members of the community and put it clear to ensure that the research approach is respectful and ethical.

CHAPTER FOUR

4. Presentation of Findings

4.1 Introduction

In this chapter, the main findings of the study are reported and explained, providing an objective presentation of the collected data and information. The presentation of results serves as the basis for a structured and organized discussion section, which offers a clear and concise summary of the research findings. It offers data and analysis relevant to the research objectives and the overall potential solutions of the study.

4.2 Traditional Architectural Values of Maasai Housing.

The study employed a qualitative research approach using In-Depth-Interviews, Field and participatory observations, Focus Group Discussion (FGD) and Literature reviews. In-Depth-Interviews with Maasai Community and spiritual leaders, Maasai households (Men and women) and Tourists and Tour guides helped to capture traditional architectural values and cultural perceptions related to housing. Field and participatory observations provided visual and structural evidence of housing design features. It enabled direct understanding of how Maasai cultural values are expressed in daily life, housing use, and adaptation behaviors within the new Msomera resettlement environment. Focus Group Discussion (FGD)- The Focus Group Discussion (FGD) provided deep insights into the Maasai community's cultural values by allowing participants to openly share their experiences, beliefs, and perceptions about housing and lifestyle changes after relocation to Msomera. Literature reviews offered background information on resettlement policies and planning guidelines. Together, these approaches ensured a comprehensive understanding of the Maasai housing transformation from Ngorongoro to Msomera.

4.2.1 The Architecture of Maasai Housing at NCA

The architectural style of the indigenous Maasai people of Ngorongoro is mainly shaped by the surrounding environment, cultural traditions and their semi-nomadic way of life, as well as the importance of folklore, rituals and symbolic values. They coexist with wildlife as they practice their pastoral way of life. Their homesteads are linked to communal grazing lands located about 10 km away and nearby areas known as "Ronjo." They are also connected to water sources vital

for both people and livestock, as well as to important spiritual, ritual, and ethnomedical sites (Fig 4-1).

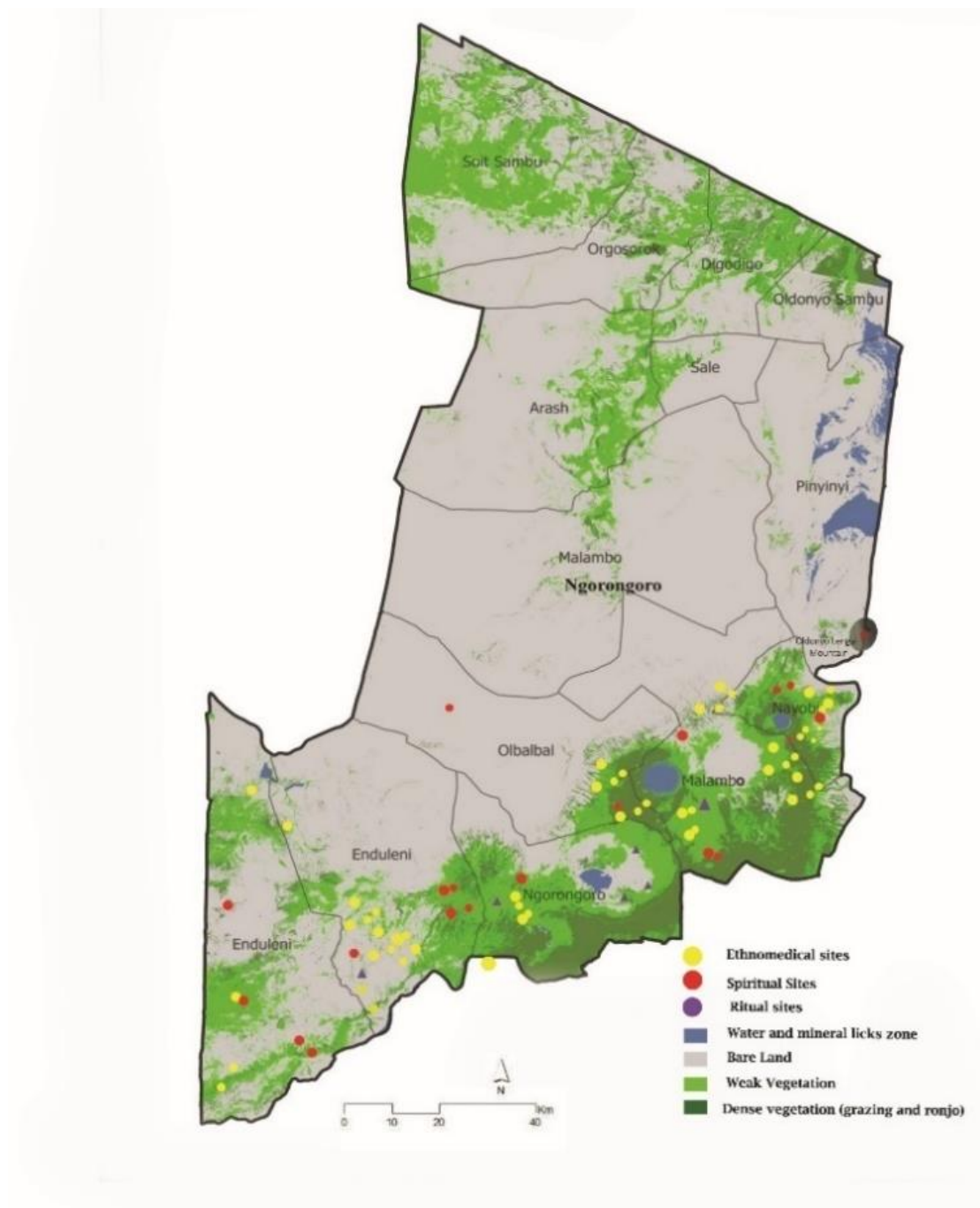


Figure 4-1: Maasai Land use at NCA-Source (Author, 2024)-
As modified from Oleshangai (2022)

4.2.1.1 Coexistence of Maasai tribe with wildlife in Ngorongoro Conservation Area.

The Ngorongoro Conservation Area (NCA), a UNESCO World Heritage Site, exemplifies the successful coexistence of the Maasai tribe and wildlife, shaped by long-term human-nature interactions. While this unique multiple land-use practice has been longstanding, challenges remain due to Human-Wildlife Conflict (HWC) arising from competition for resources. To mitigate HWC, villagers have constructed livestock enclosures and implemented grazing zoning, while being advised to avoid high-predation areas (Nyerembe 2020).

4.2.1.2 Maasai Pastoralist practice in NCA

Pastoralism is the major means of livelihood for Maasai in Ngorongoro. The Livestock, especially cattle, are very important to the Maasai and are considered a symbol of wealth and prosperity in their community and play a central role in their cultural practices. The number of livestock a person owns often determines their social status and influence. According to the villages and wards where they live Maasai tribe herd their livestock in a large piece of grazing land without restriction except few restricted zones areas covering Ngorongoro crater and administrative places. The estimated number of livestock in NCA during the time of this research is 819,460.

Maasai use smaller communities called “ngutot” for effectiveness management of land and other natural resources. These communities, based on territorial occupation and composed of several clans, have a well-established system for utilization of pastures, water and mineral licks. Each Maasai "boma" may have a designated drought reserve called an "alalili" to support vulnerable animals during draught season, while other areas surrounding the homestead are available throughout the year (Figure 4-2)



Figure 4-2: Integrated landscape for livestock pastoralism and wildlife (Source: Author 2024)

There is also a common reserved land further away from their homestead around 8-10km which can be accessed by all members of Maasai community during the dry season of the year. They build seasonal camps called “ronjo” within these reserved areas since the reserved areas may be found in many kilometers from their permanent settlement. Seasonal camps are also established in areas where mineral licks are found and when there is in need of them for livestock in a particular time. These seasonal camps may consist of temporary sleeping huts equipped with mattress laid down and hearth "orupie", cattle knaal" boo o nkishu"calves pen “olale lo lasho”, goats and sheep pen “olale lo ndare o ngerak”.

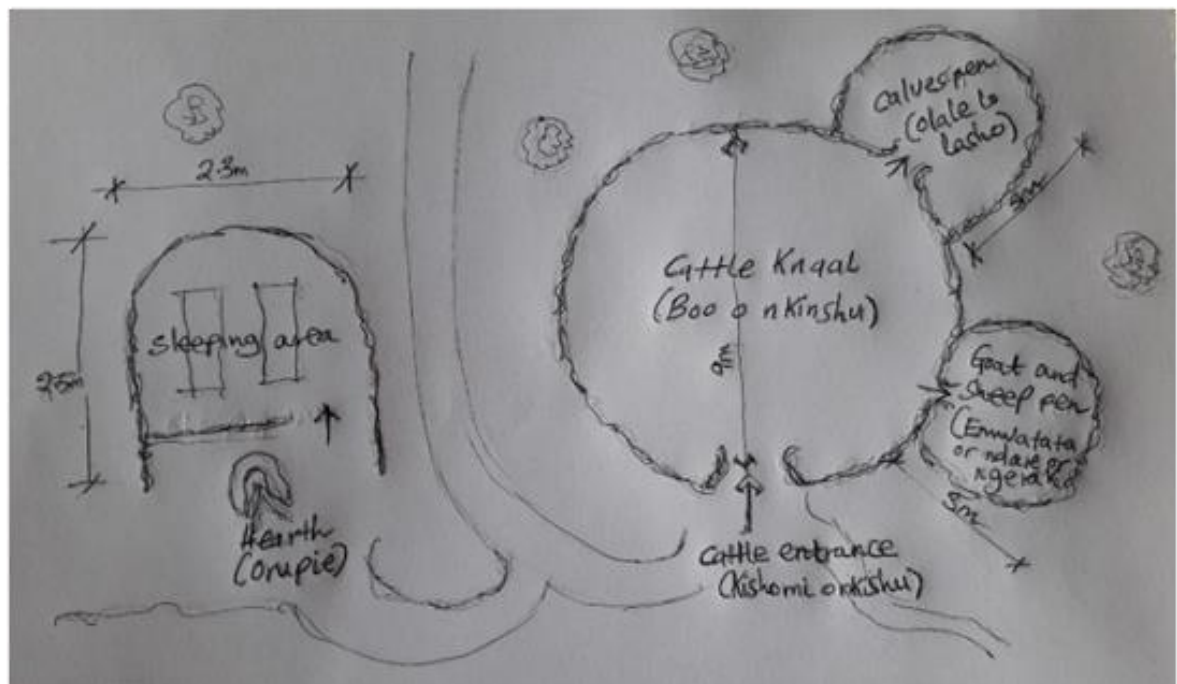


Figure 4-3: Seasonal camp "ronjo" (Source: Author 2024)

4.2.1.3 Sacred sites for Maasai at NCA

Sacred sites at NCA are of immense cultural, spiritual and historical importance to Maasai communities. They are places of worship, spiritual connections and places of cultural preservation. These areas are protected and preserved, ensuring that their importance is recognized and respected. These sites include Ethnomedical sites, Ritual sites and spiritual

sites. The NCA has ethnomedical sites that preserve and practice traditional healing techniques and medical knowledge in Maasai cultural communities. These places, such as healing centers and shrines, are important in preserving traditional healing practices and transmitting cultural knowledge related to health and well-being.

There are also ritual sites, which are places where religious or ceremonial rituals are performed. These sites are considered sacred and hold cultural and spiritual significance for local communities, serving purposes such as expressing devotion, celebrating life events, and seeking guidance. They play a crucial role in community cohesion by establishing norms and fostering relationships while facilitating communication with the divine. Within the NCA, Oldonyolengai Mountain is a notable spiritual site where visitors seek enlightenment, a connection with the divine, and a sense of peace

4.2.1.4 Maasai Homestead layout and orientation

The positioning and arrangement of Maasai homesteads are influenced by the cultural axis known as "Kopkop," which in turn dictates the placement of the main entrance called "kishomi." The homestead is then divided into two sections: "entaloishu e tatene," which is established by the first wife, and "entaloishu e kedyange," which is established by the second wife as well. The extra wives alternate on both sides according to a set cultural sequence. If the first wife dies, the second wife must replace the first one. The main entrance, the knaal "boo o nkishu," and the symbolic twig "Oltim," which stands for the homestead elder, are all connected by the axis. The "oltim", a chopped tree, is a gate with great cultural significance.

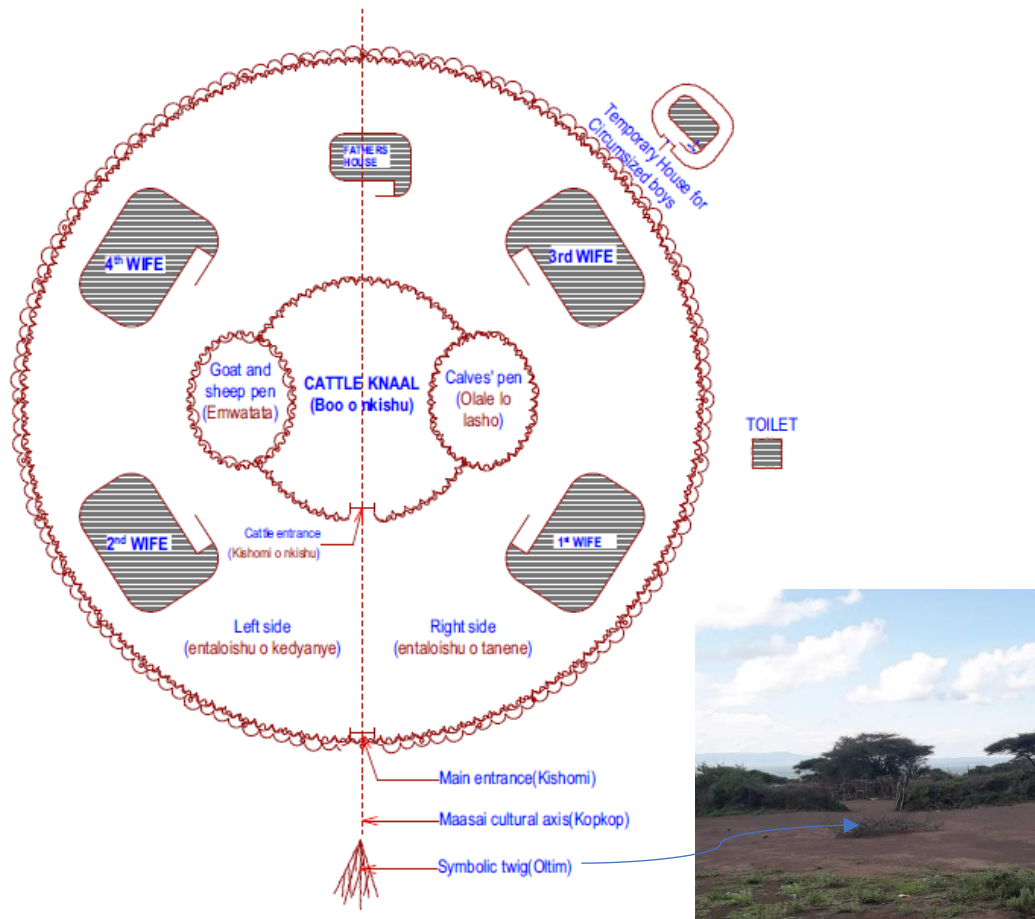


Figure 4-4: Maasai Homestead layout and orientation-Source (Author 2024)



Figure 4-5: A and B are Maasai Homestead layout typology 1 and 2-Source (Author 2024)

4.2.1.5 Spatial requirement for Maasai homestead

Maasai homesteads' spatial requirements are shaped by the community's cultural values. Depending on prevailing social dynamics of a particular homestead a typical Maasai homestead consists of: a cattle pen "boo o nkishu", a calves' pen "olale lo lasho", a goat and sheep pen "emwatata o ndare o ngerak", a court yard called "alamanaa" which enables regular monitoring and care of animals due to the proximity of humans and livestock, several dwellings for people and cattle, a backyard "kioni" which is used for several functions such as storage of firewood, sticks, ash and grass. Toilet is mostly located at the backyard "kioni" some distance for privacy. In some homestead you can find separate pens for donkeys and a special area for reviving and treating sick animals. Depending on the user and functional requirements the typical indigenous Maasai house possess the following functional spaces: entrance, lobby, calves/kids pen, hearth, men's bed, woman's bed, storage, firewood stack, and shelves (Fig 4-8, 4-9).

4.2.1.6 Maasai Homestead organization

Maasai homestead organization in Ngorongoro is influenced by their social structure and cultural practices. Maasai homesteads are strategically designed with three concentric layers: a fence, dwelling units, and livestock enclosures. This thoughtful design serves the purpose of enhancing security against carnivores and protecting the livestock from raids.

The fence, acting as a protective barrier around the homestead, serves as the first line of defense, keeping carnivorous animals at bay and reducing the risk of attacks on humans and livestock. The second layer comprises separate dwelling units within the Maasai homestead, providing individual living spaces for family members and enabling effective household management and protection. The third layer is the livestock enclosure (knaal), known as "boo o nkishu," which is strategically placed within the homestead to serve as a secure space for both the Maasai and their livestock. The arrangement of the homestead was guided by the knaal, which determined how the homestead was organized and structured. By keeping them near their homes for close monitoring and protection, this plays a crucial role in their livelihood and cultural heritage.



Figure 4-6: Maasai homestead organization (Source; Author 2024)

Based on social-cultural dynamics, Maasai permanent homesteads are divided into two main categories: the "nkang'itie sapukin," a multiple family homestead where closely related families with strong social-cultural bonds live together in a gradually expanding manner while preserving their cultural traditions, and the "elit," a single elder homestead preferred by those seeking less social interaction. The distinctive arrangement of Maasai homesteads not only protects their way of life and livestock, but also helps prevent conflicts with wildlife and neighboring settlements, ensuring the preservation of their livelihoods and cultural heritage.

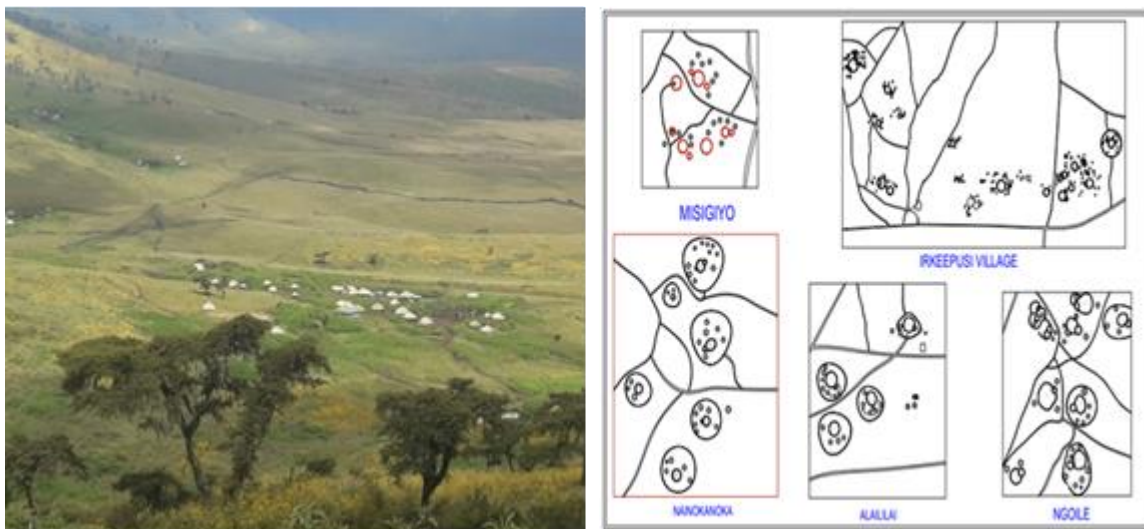


Figure 4-7: Maasai Homestead organization pattern at NCA (Source: Author 2024)

4.2.1.7 Maasai Hierarchy

In Maasai community, the cattle kraal is the most sacred space. Homestead organization is determined by the cattle kraal. It is considered as a focal point of design as you must think it

first before organizing other structures of their homestead. Its style develops from Maasai customs. The design of the livestock enclosures is influenced by the folklore and traditions of the Maasai people, gradually evolving over time. The Maasai construct livestock enclosures following traditional customs, which dictate that the goat and sheep pens should have an average diameter that is one-third of the cattle kraal. The Maasai people use cattle kraals as both functional enclosures for livestock protection and as places where cultural customs and rituals are woven into the fabric of their way of life, demonstrating the close bond that exists between the Maasai and their livestock. Examples of Rituals associated with Maasai cattle kraals are Rite of passage (which involves circumcision of both male and females), “Eunoto” ceremony (an important Maasai warrior coming-of-age ceremony).

4.2.1.8 Maasai Housing style and forms

Maasai home architecture in Ngorongoro reflects the pastoralist nomadic lifestyle of the Maasai people, emphasizing mobility, protection, and practicality while showcasing their cultural values and traditions. In Maasai culture, every woman builds her own home. This idea has explained elsewhere as “the dweller as a designer”(Mottaki Zoheir 2013). In traditional cultures, construction is guided by the body, much like how a bird shapes its nest through the movements of its body. Maasai women, as expert builders, pass on their wisdom to future generations through their involvement in this particular house design.

There are three major types of indigenous houses that are commonly found in Ngorongoro; the cow dung house “enkaji emodoi” round thatch house “enkaji orkujita” which was adapted from Arusha and contemporary houses possessed by few households which are prohibited in NCA. Currently, the round thatch houses type is the dominant architectural style in the Ngorongoro landscape. The houses are arranged in a circular pattern, and the dwellings are located on the periphery, forming a central space. This circular arrangement is designed to create a sense of community and safety. The functional design of their house follows the criteria of functionality defined by culture and society. The Maasai housing style serves as both practical structures and symbolic representations, with the village layout and central space highlighting the significance of cattle in Maasai culture and livelihood (Figure 4.1).

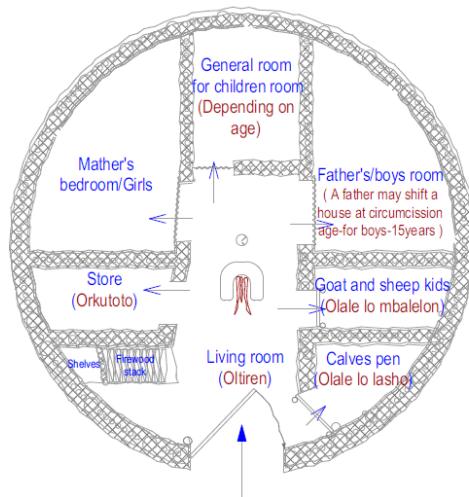


Figure 4-8: Typical Maasai Round thatch house (Source: Author 2024)

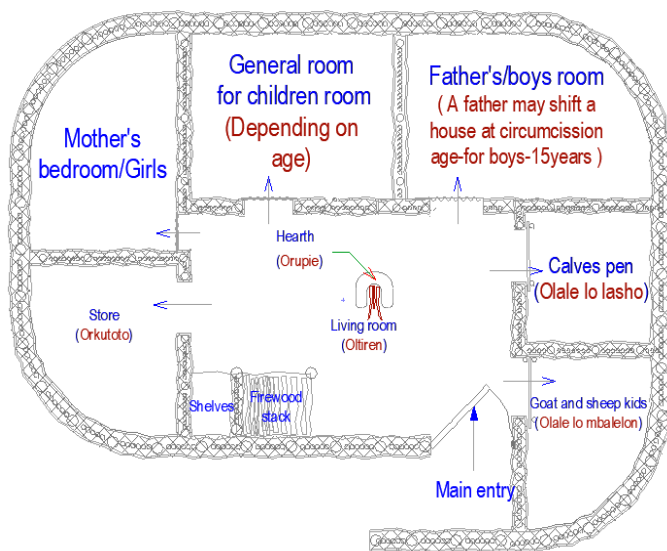


Figure 4-9: Typical Maasai cow dung house (Source: Author 2024)

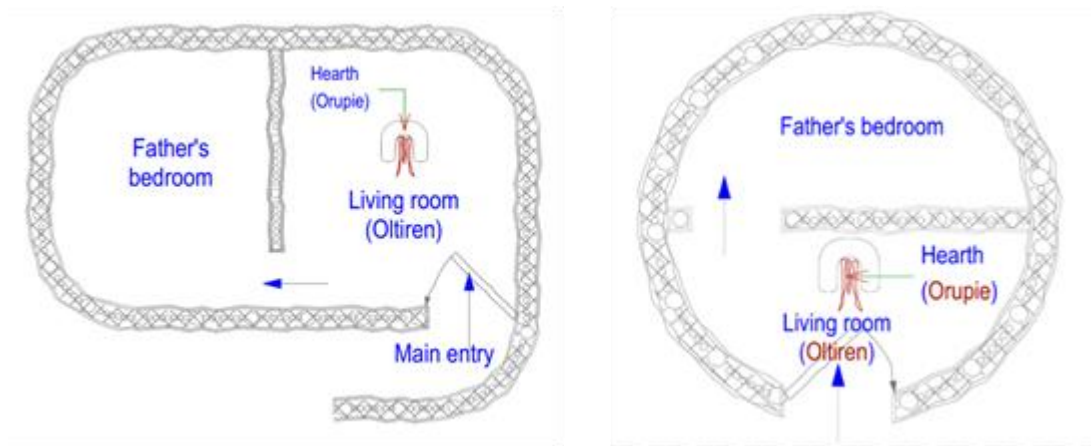


Figure 4-10: Typical Maasai Fathers house (Source: Author 2024)



Figure 4-11: Typical Maasai father's thatch house (Source: Author 2024)

4.2.1.9 Materials and construction techniques

Maasai homestead, known as "enkang," at NCA are built by women using local materials found in their local environment, such as sticks, mud, and cow dung and dry grass. These materials are readily available in Ngorongoro and sustainable, reflecting the Maasai's deep connection to their natural environment.



Figure 4-12: Maasai homestead construction Materials (Source: Author 2024)

4.2.2 Architecture of Maasai Housing at Msomera

The Maasai tribe living in Msomera was presented with the opportunity to transition to modern housing for those who chose to relocate. This new residential area, covering 2.5 hectares, adhered to town planning regulations. Moreover, the tribe was granted an additional 5 hectares for agricultural purposes, along with a communal area designated for grazing. To support their quality of life, the community was provided with vital social amenities, such as schools, a dispensary, water and electricity services, security posts, and even facilities for livestock auctions and markets.

4.2.2.1 Communal space for Glazing

As discussed previously, Maasai people rely heavily on pastoralism, which not only offers them economic advantages and nourishment but also a solid cultural base. Maasai people were provided with glazing land in Msomera which is vital for the survival of the Maasai pastoralist lifestyle, providing them with the necessary resources to maintain their cultural practices and livelihoods in a new environment.



Figure 4-13: Maasai glazing land at Msomera (Source: Author 2024)

For effective use of communal space for glazing, the area is equipped with important facilities for livestock care, such as artificial water points and dip tanks, which significantly enhance the management and welfare of the animals. These facilities not only improve the health and well-being of the animals but also foster sustainable practices in the Maasai pastoral community



Figure 4-14: Artificial water points and Dip tanks for livestock dehydration and healthcare at Msomera (Source: Author 2024)

In response of having sustainable access to grazing land at Msomera, temporary camps “ronjo” were also established by Maasai approximately 8km from Msomera to grazing land. These camps serve as a crucial resource for Maasai pastoralists, allowing them to save their livestock during the dry season by providing access to grazing lands.

These camps include sleeping areas for herders, Cattle knaal “Boo o nkishu”, Goat and sheep pen “Emwatata o ndare o kerak” as well as a dedicated space for the recovery and care of ill animals. Many livestock often remain in grazing areas for long durations without returning home. This is primarily because the spaces within residential plots and neighboring human residences are not suitable for livestock breeding activities.



Figure 4-15: Seasonal camps "ronjo" at Msomera (Author: 2024)

4.2.2.2 Ritual and Ethnomedical sites for Maasai at Msomera

The Maasai people possess a profound connection to their land, with sacred sites encompassing ethno medical, ritual, and spiritual areas holding immense significance in their culture and identity. As they face ongoing relocation from the Ngorongoro region to Msomera, the importance of these sacred sites becomes even more pronounced, as they serve as vital links to their heritage and traditions. However, in the new resettlement zone of Msomera, many of these crucial sacred sites have yet to be properly identified, posing a challenge for the Maasai in maintaining their cultural practices and connections to the land that have defined their existence for generations. However, there is a mountain known as Ndorobo Mountain, which serves as the habitat for the Ndorobo tribe and is also the location where they engage in their cultural

practices. As the relocation is underway, cultural changes are anticipated, along with adaptations related to these spiritual sites.



Figure 4-16:Ndorobo mountain at Msomera (Source: Author 2024)

4.2.2.3 Maasai Homestead organization at Msomera

At Msomera resettlement area, the site planning and block design were developed to support both modern planning standards and community-based living patterns. Within each block, several key spaces and facilities are included to promote functionality, social interaction, and compliance with regulations. The major important spaces within the blocks include: Residential plots, Open spaces, Cemetery areas (burial grounds), Access roads and pathways, public service areas and glazing land for livestock.

The housing development is designed in a grid pattern, where buildings and open areas are arranged in a layout that features streets and blocks intersecting at right angles. In order to maintaining order and clarity in ownership and usage of land, beacons were clearly located at designated boundaries of the plots. This design aims to improve land use efficiency, foster better connectivity, and facilitate future changes and adaptations. The layout of the housing was influenced by the designer's idea for how the buildings should be organized and structured. Unlike other major facilities provided in the blocks, each residential plot is designed to include

a three-bedroom house along with an external toilet and bathroom block. The main building and toilet are located at the back of the plot, allowing ample space in the front for potential future extensions. Each plot is designed to allow each house holds to access their homes via main roads that connect to the residential areas. But due human cultural behavior and user experience on use of space, some of the residential plots has started adapting their culture.



Figure 4-17: Examples housing organization pattern at Msomera (Source: Author, 2024)

4.2.2.4 Maasai Housing style and forms at Msomera

The Msomera project is a major project that aims to respond to the needs of the population moving from the Ngorongoro Conservation Area (NCA) in Tanzania. The purpose is to build some houses to support the incoming residents and strengthen the local infrastructure. The project is to build 5,000 houses arranged in blocks A to D. The ongoing development reflects a significant effort by the government to provide adequate housing and essential services.

The architectural style of the Maasai homes in Msomera reflects a combination of traditional and modern materials and construction techniques aimed at creating long-lasting and functional

living spaces. The floors are sanded for stability; the plastered and pointed block walls give a nice surface. Corrugated steel sheets provide a durable and waterproof roof and are filled with concrete for a clean look. Grilled doors increase security and ventilation, and metal windows provide light and air flow. With the combination of electricity and drinking water system, these buildings are designed to ensure the comfort and well-being of the community.

The housing form at Msomera is characterized by its simplicity and functionality, featuring thoughtfully designed floor plans that comfortably accommodate three bedrooms, a sitting room, and an external toilet. Two distinct typologies emerge within this community: Typology One showcases a traditional gable roof, providing aesthetic appeal and effective rainwater drainage, while Typology Two embraces a modern flat roof, contributing to a sleek silhouette. Both designs prioritize sustainability, incorporating eco-friendly materials and energy-efficient practices. Each house boasts a generous headroom of 3 meters, enhancing the sense of space and natural light within the living areas, fostering a warm and inviting environment for residents.



Figure 4-18: House Typology-1 at Msomera (Source: Author, 2024)

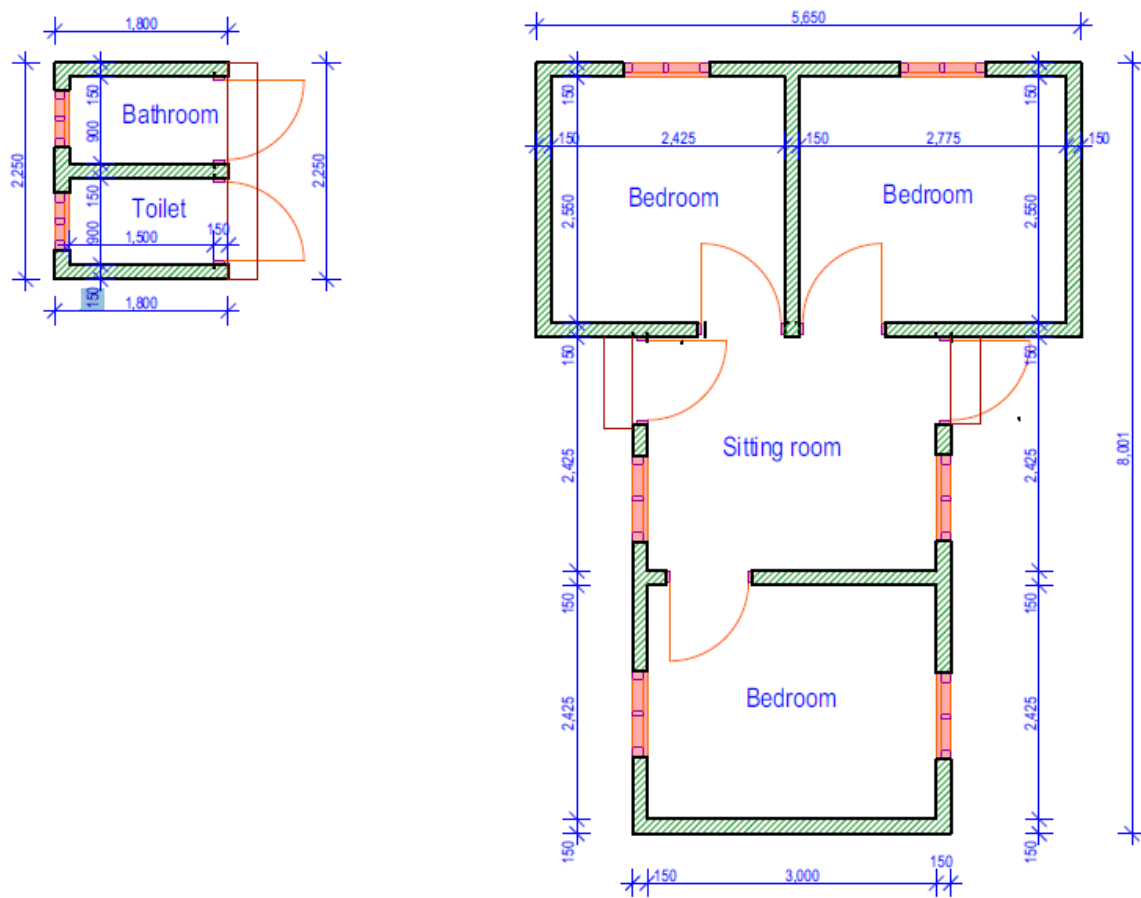


Figure 4-19:Housing Typology 2 at Msomera-Source: (Author 2024)

4.2.2.5 Burial Traditions and Site Planning Adaptations at Msomera

After relocation to Msomera, the Maasai community experienced changes in their burial traditions due to new settlement planning requirements and cultural adaptation. Traditionally, the Maasai did not bury their dead but left the bodies in the forest to be devoured by wild animals, keeping death away from the homestead. However, at Msomera, designated cemetery spaces have been incorporated within the site plan to comply with formal burial regulations and public health standards. While some Maasai influenced by Christianity and formal education have adopted church-based burial practices, such cases remain few. The allowance for residents to identify burial areas within their residential plots and the inclusion of cemeteries within planned blocks contradict their traditional beliefs and spatial organization, where death was deliberately kept distant from living spaces and the homestead layout reflected purity, life, and continuity.

4.2.2.6 Housing Adaptation and incremental of spaces at Msomera.

In Msomera, the Maasai people's approach to housing demonstrates a flexible and evolving lifestyle that honors their cultural traditions and personal requirements. Initially, residents receive basic housing, but they are encouraged to gradually expand and adapt their homes to accommodate their growing families and the polygamous structure of their society. This incremental housing strategy promotes adaptability, enabling residents to improve their living conditions over time. Through self-directed modifications, individuals not only gain empowerment but also enhance the resilience of their community. In this case the fundamental principles of user experience are being applied by residents in the adaptation and upkeep of their living spaces.

In this study, purposive sampling technique was used to select some households that have undergone significant changes since relocation. The initial selection criteria focused on identifying households experiencing major changes in their living space during relocation. It was mainly households which was relocated at the earlier stage of relocation. Focusing on buildings that are experiencing major changes that allows for a deeper understanding of how these families change and use their space to respond to new situations. In contrast, buildings that showed little change were generally excluded from the analysis because they had less impact on the objectives of the study. This approach aims to capture the dynamics of adaptation in the context of transition and provide real insights into the lived experiences of these families.

Household 1

In this household, structures are arranged in a circular pattern around a central area, typically a cattle pen known as “Boo o nkishu,” along with a goats and sheep pen called “emwata o ndare o ngerak.” This layout enhances security and highlights the cultural significance of cattle as a treasured asset among the Maasai. However, due to limited space, a goats and sheep pen was constructed instead of a cattle pen, accommodating a smaller number of animals that are easier to manage and less disruptive to the environment. The cattle are herded to communal grazing land throughout the year, where they reside in temporary camps called “ronjo.

A new house is being constructed alongside the main residence to serve as a kitchen and storage area, addressing the needs of a unique family structure consisting of two wives, their children, and the father, each occupying separate rooms. This additional building complements the original design laid out by the previous designer, ensuring functionality and harmony within the living space. Surrounding the property, traditional building materials have been utilized for the fence, entrances, and livestock enclosure, while modern corrugated iron sheets have been chosen for the roofing, blending both contemporary and traditional elements in this evolving homestead.

This household has embraced crop cultivation, specifically maize plantation, as an alternative livelihood, making use of the 5 hectares allocated for this purpose while also encroaching on some residential spaces. In keeping with their customs, they have designated a specific area within their residential plot to support livestock during the drought season, known as "olalili," ensuring their animals have adequate care during challenging times.

Interestingly, despite the availability of main roads that facilitate communication between households, they prefer to navigate through shorter pathways, reflecting a deep-rooted understanding of human behavior and the value of close-knit community interactions

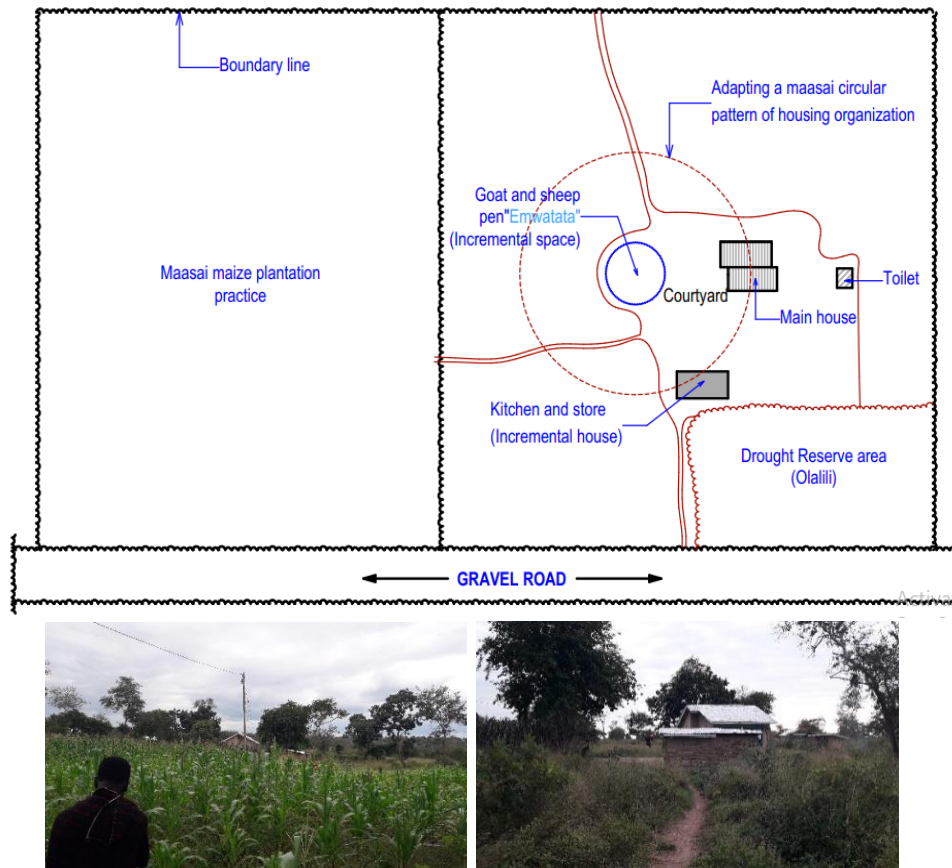


Figure 4-20: Adaptation and incremental of spaces-Household-1 (Source: Author 2024)

Household 2

In this household, users have thoughtfully arranged their dwellings and structures in a circular formation around a central area known as the cattle knaal, or “Boo o nkishu,” complemented by nearby goat and sheep pens referred to as “emwata o ndare o ngerak.” This layout not only enhances security but also underscores the cultural significance of cattle within the Maasai community. Furthermore, the design of new Incremental Buildings aligns with traditional housing typologies, featuring simple plans with gable roofs, constructed primarily from local materials for the walls and structural envelope, while utilizing corrugated iron sheets for roofing blending modernity with cultural heritage. This household is characterized by a polygamous family structure; three wives and their six children share a single main house. As their cultural customs dictated, they began constructing additional homes to better accommodate their needs and uphold their cultural identity. This expansion aimed to establish distinct living spaces for

each wife, yet it also introduced a significant challenge: determining which wife would claim ownership of the main house.

The incremental design of the new structures was influenced by the vision of the original designer, reflecting a blend of tradition and adaptation. Livestock are often herded in unofficial open spaces, typically located in areas that remain unpopulated and undeveloped. As designated zones for grazing exist, the ongoing land development and construction in these regions pose a significant challenge for local households.

With the expansion of residential plots and the encroachment of urbanization, there is a growing concern that these families may find themselves with insufficient space to accommodate their livestock. This situation could lead to conflicts between the needs of the livestock and the demands of a developing neighborhood, highlighting the need for careful planning and consideration of agricultural space in the face of urban growth.

Similar to other plots, the establishment of main roads linking each household facilitates seamless communication. Residents often utilize short pathways to navigate between different spaces and engage with their neighbors, reflecting the natural human tendency to seek convenience in interaction.

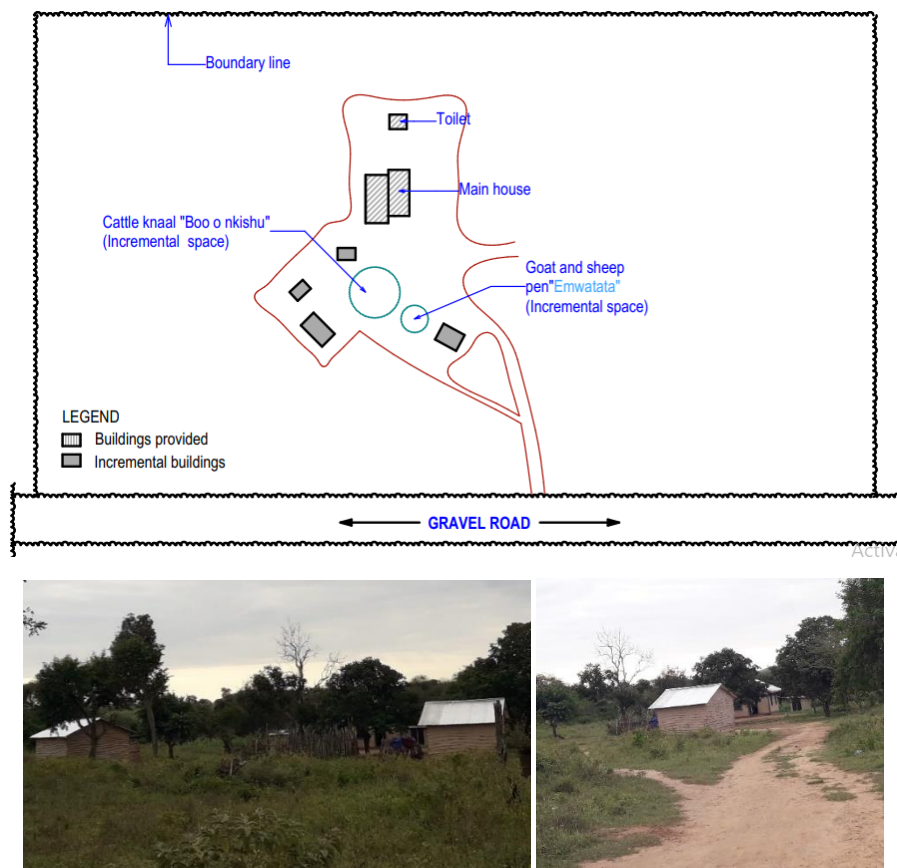


Figure 4-21: Adaptation and incremental of spaces-Household-2 (Source: Author 2024)

Household 3

The family was granted a main house equipped with a toilet, yet they decided to expand their living space by adding a kitchen and a store to the homestead's compound. This household consists of a single wife and her three children, with the father taking on the role of the family leader. Together, they strive to create a nurturing environment, balancing the responsibilities of daily life while fostering a sense of unity and support within their small community. The cattle knaal, known as "boo o nkishu," is situated at the rear left side of the main house, in close proximity to the main road that provides access to residents. However, its location is not in accordance with the traditional Maasai homestead organization pattern, which typically places the cattle knaal "boo o nkishu" at the center of the homestead. This central positioning is crucial as it enhances security and underscores the significance of cattle within the Maasai community. Cattle are not only a vital source of livelihood but also hold cultural importance, making their strategic placement essential for both protection and community values. In the residential plot, a specific area has been set aside to house livestock during the drought season, referred to as

"olalili," reflecting their cultural traditions. Additionally, a substantial portion of the plot has been allocated for maize cultivation, serving as an alternative source of livelihood for the community.

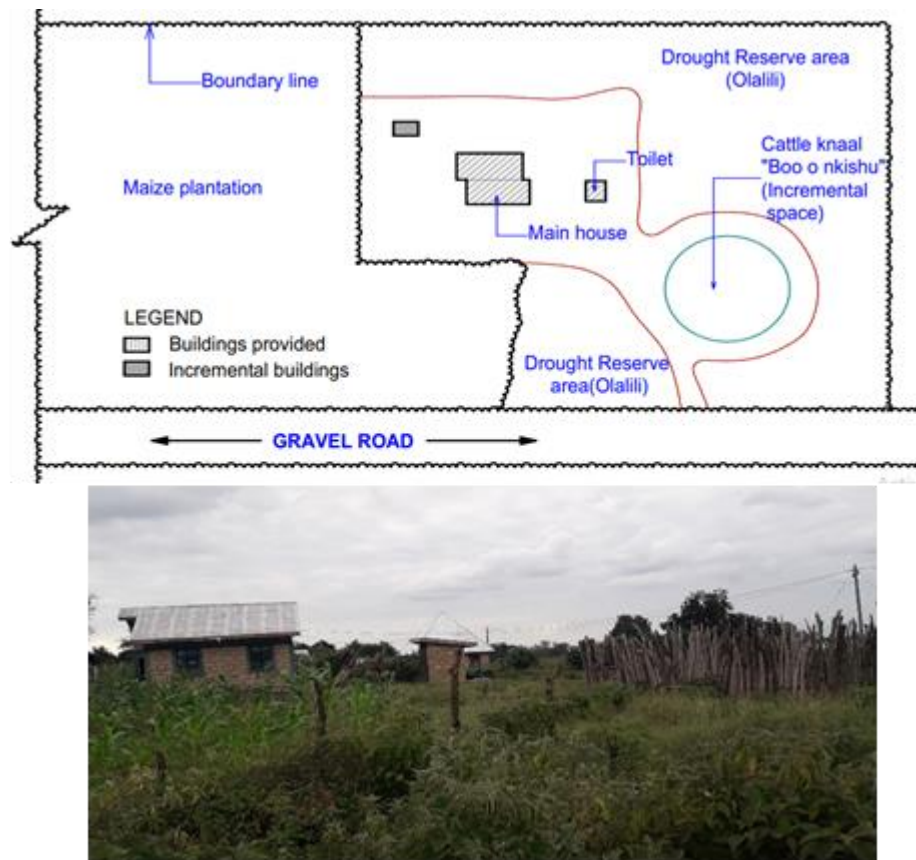


Figure 4-22:Adaptation and Incremental of spaces- Household 3 (Source: Author 2024)

Household 4

The household was provided with a main house featuring three bedrooms, a sitting room, and an external toilet. In addition, the users constructed two small houses and a kitchen within the homestead's compound: one house for the second wife and the other for the boys. These additions accommodate the growing number of users, reflecting the polygamous lifestyle of the Maasai people, and are arranged in a circular pattern to align with their cultural practices.

The users designed these incremental buildings to match the existing housing typology, featuring simple plans with flat roofs and utilizing local materials throughout the building envelope, except for the roofing, which is made of corrugated iron sheets. This household keep only goats and sheep at home, while cattle are herded in communal spaces for grazing, known

as "ronjo," due to limited space. These livestock remain there throughout the year. Additionally, they have set aside a specific area within their plots, referred to as "olalili," to house livestock during the drought season, in line with their traditional practices. The residential plot includes a substantial area for maize cultivation as an alternative livelihood, while the fences, entrances, additional dwelling units, and livestock enclosures are constructed with traditional materials, except for the roofing, which is made of corrugated iron sheets.

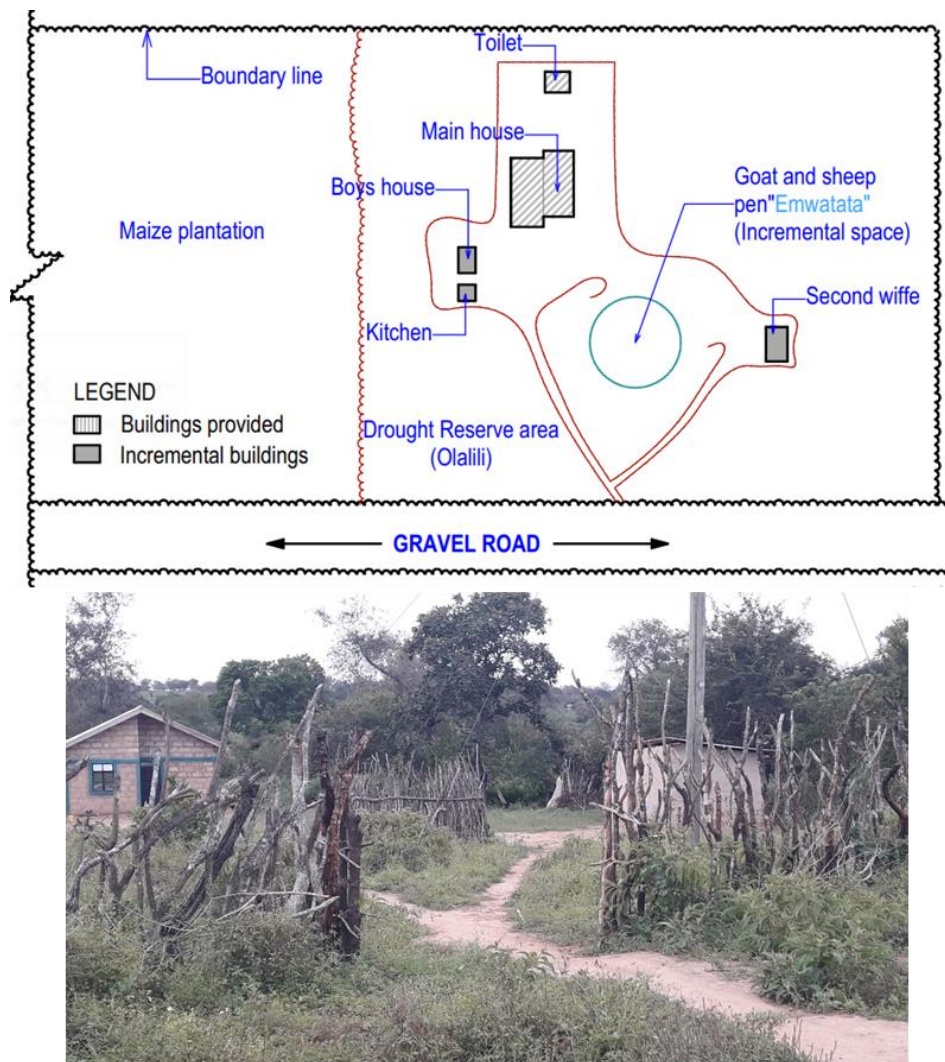


Figure 4-23: Adaptation and incremental of spaces-Household 4 (Source: Author 2024)

Household 5: The household consists of a father, his three wives, and five children, with the first two wives and their children residing in the main house, while the third wife and the father live in separate additional houses. These new houses are designed to align with the existing architectural style, featuring simple flat roofs and constructed from local materials like sticks,

mud, and cow dung for the walls, while the roofs are made of corrugated iron sheets. The cattle kraal, known as "boo o nkishu," is situated on the right side of the main house, conveniently near the main road that leads to the homestead's entrance. Livestock are

often herded in non-official open spaces, typically undeveloped areas surrounding residential plots. When local grazing becomes scarce, herders move their animals to designated grazing lands in special camps known as “ronjo” to ensure their livestock have access to sufficient lgrass. A significant portion of the residential plot has been allocated for maize cultivation, maximizing the use of available land for agricultural purposes. This allows residents to grow their own food and contribute to their household's sustainability.

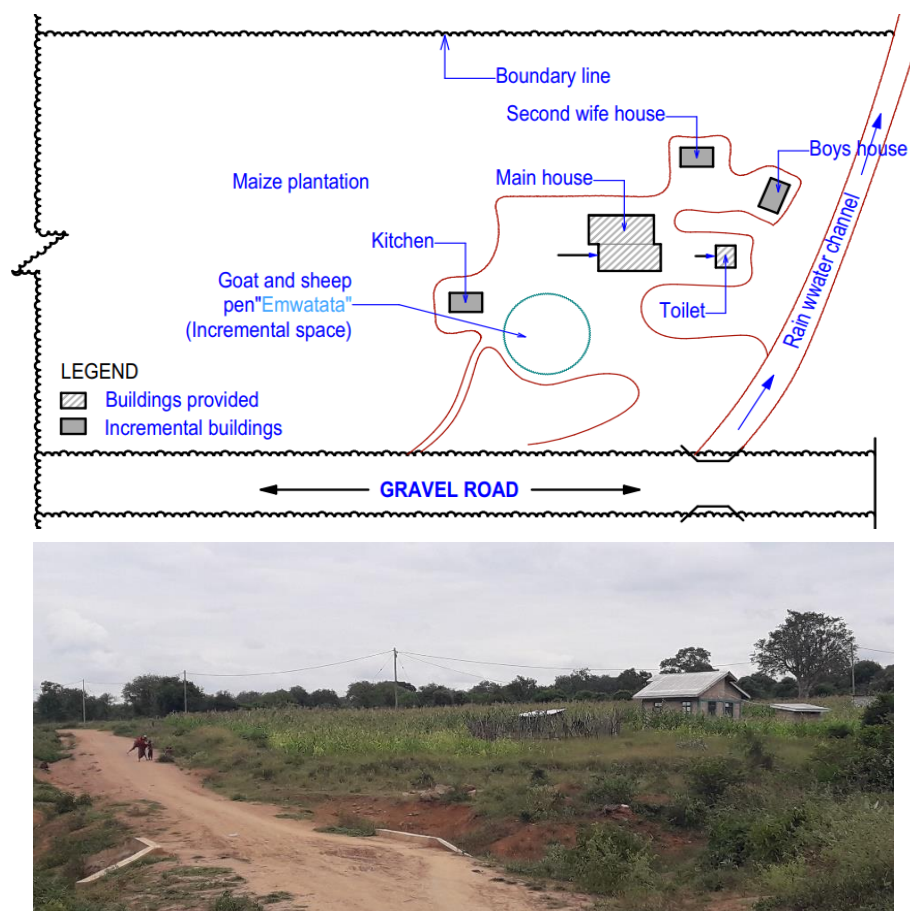


Figure 4-24: Adaptation and incremental of spaces-Household 5 (Source: Author 2024)

Household 6

The household consists of a father, who leads the family, his wife, and their five children, which include both boys and girls. They were given a primary residence along with an outdoor toilet, and have begun building more structures on their property. This includes a small house

designated for the boys and a kitchen to meet their needs. The cattle kraal, known as "boo o nkishu," and the pen for goats and sheep, referred to as "emwatata," are situated near the main entry road. Livestock are typically herded in unofficial open space regions that remain undeveloped and unpopulated. In instances where grass is scarce, they are taken to grazing areas and reside in designated camps called "ronjo." Additionally, a portion of the residential plot has been allocated for maize cultivation.

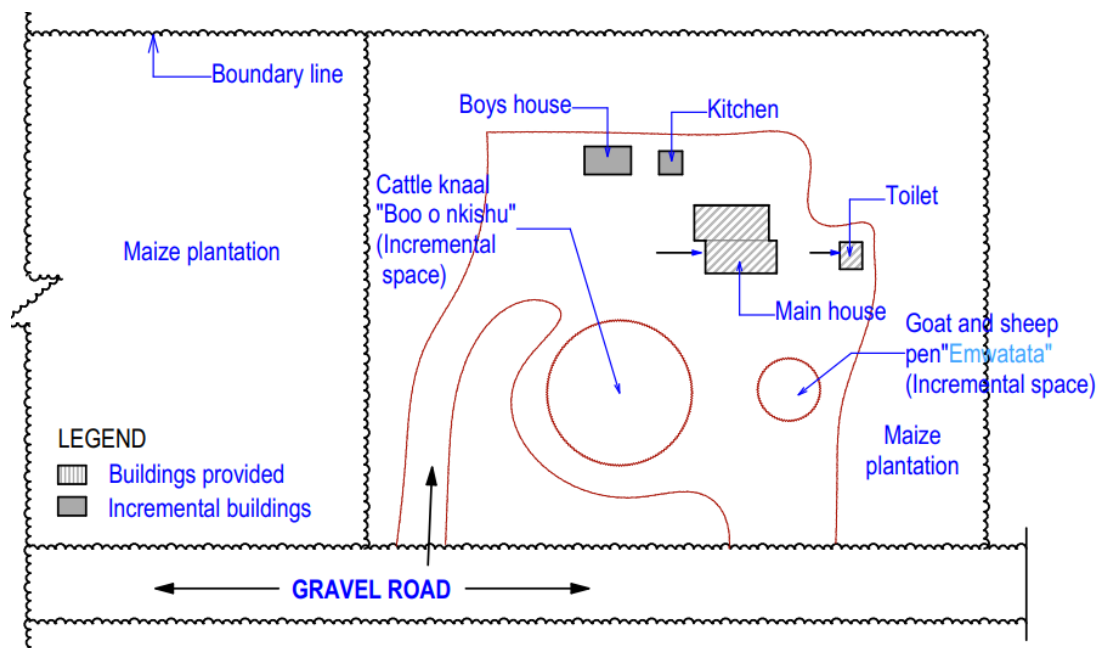


Figure 4-25: Adaptation and incremental of spaces-Household 6 (Source: Author 2024)

Household 7

The household consists of a father, his wife, and their four children, both boys and girls. They live in a main house with an external toilet and have begun building additional structures on their property, including a small house for the boys and their father, as well as a kitchen to meet their needs. Cattle kraals, known as "boo o nkishu," and pens for goats and sheep, referred to as "emwatata," are situated near the main entry road. Livestock are typically herded in unofficial open spaces that are undeveloped and not yet populated. In times of grass scarcity, they are also herded in grazing areas and stay in designated camps called "ronjo. In the residential area, a specific section, known as "olalili," has been set aside for livestock during the drought season, while another portion of the residential plot is being used for maize cultivation.

This section above demonstrated that the Maasai has an adaptive characteristic that plays a vital role in maintaining a balanced harmonious relationship between them and their living

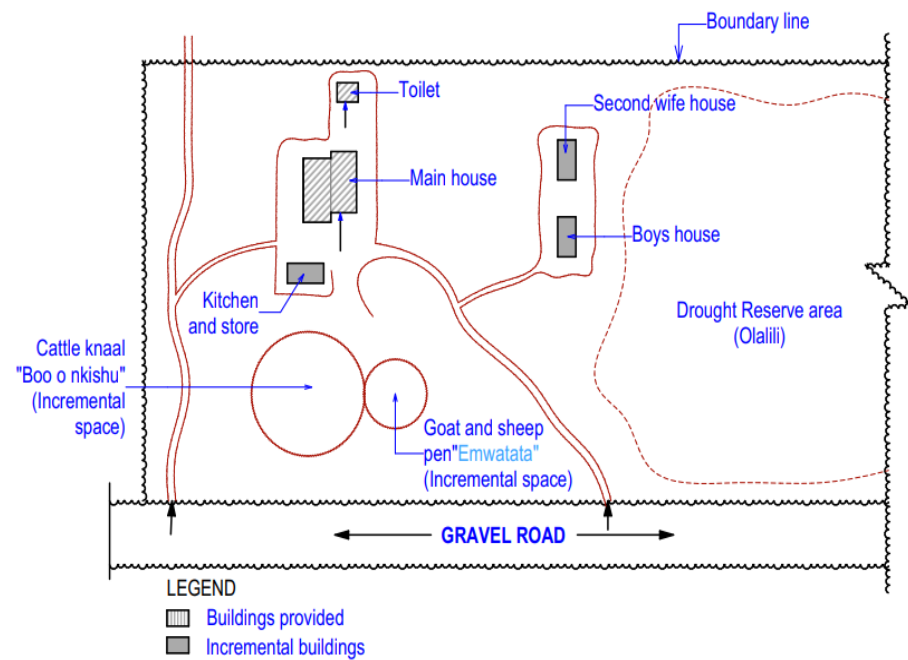


Figure 4-26: Adaptation and incremental of spaces-Household 7 (Source: Author 2024)

environment. This aligns with the study by Eerd (2023) which argued that the resettlement housing often fails to consider the unique needs, norms, culture, and way of life of relocated individuals, leading them to adapt their living spaces incrementally to cope with their new environment and restore their livelihoods.

4.2.3 Comparing Qualities of Maasai Housing at Ngorongoro and Msomera Tanga

To gain a comprehensive understanding of Maasai traditional cultural values, comparing the qualities of traditional housing at Ngorongoro with modern housing at Msomera Tanga is significant. This comparison reveals stark differences in architectural styles, social organization, and cultural practices. Traditional homes, or enkangs, serve not only as functional spaces but also as representations of Maasai identity, promoting community bonds and cultural continuity. The importance of traditional housing in preserving and transmitting these cultural values underscores the need to protect these practices against the challenges posed by modernization and development. The table below illustrates this phenomenon.

Table 4-1: Comparison of Qualities Between Maasai Homesteads at Ngorongoro and Msomera Tanga

	Indigenous Maasai Homestead at Ngorongoro	Indigenous Maasai Homestead at Msomera
<i>Location, layout, and orientation</i>	Maasai elders utilize indigenous environmental knowledge to inform their site selection decisions.	The location of housing in Msomera is shaped by the political dynamics of the region.
	The positioning and arrangement of Maasai homesteads are influenced by the cultural axis known as "Kopkop," which in turn dictates the placement of the main entrance called "kishomi."(Fig 4-4)	The positioning and arrangement of housing in Msomera are shaped by the architect's ideas and concepts (Fig 4.21-4.27).

<i>Buildings styles, Form and design</i>	The physical qualities are shaped by indigenous design principles that stem from the environment, cultural beliefs, social connections, and folklore.	The physical qualities are shaped by predefined socio-economic and political dynamics, primarily influenced by designers' concepts that focus on low-cost housing.
	The Maasai homestead at NCA experiences gradual organic growth through the adaptive nature of their traditional lifestyle (Fig 4-7), enabling incremental expansion and modification of living spaces in response to changing environmental conditions and social needs.	The Maasai homestead at Msomera is arranged in grid pattern (Fig 4-16) to ensure efficient land use, improving accessibility and navigation as well as allowing easy infrastructure development and maintenance.
	The Maasai housing style and forms at Ngorongoro are not only practical structures but also have symbolic meaning to enhance cultural identity (Fig 4-8, 4-9).	Contemporary housing in Msomera emphasizes modern materials and cost-effective designs for functionality and efficiency, but lacks the symbolic significance and cultural resonance of traditional Maasai structures, which reflect their pastoral lifestyle and community values (Fig 4-17, 4-18).
<i>The use and functions of buildings</i>	Homesteads are designed to accommodate the semi-nomadic lifestyle of the Maasai.	Houses are not inherently designed to support the traditional Maasai lifestyle
	Spaces thoughtfully designed to support polygamy family structures which are common to Maasai culture.	The design of houses in Msomera does not support polygamy. Users are expanding their spaces to accommodate their needs.

	The housing design facilitates social interactions and cultural practices, reinforcing community bonds and traditions.	Houses design lacks social interaction and community bonds.
	Homestead and external spaces design enhance strong connectivity and social interaction.	Houses and external spaces design enhance low connectivity and social interaction.
	Design and organization of housing enhance strong security.	Design and organization of housing enhance poor security.
	Houses offer year-round thermal comfort; the materials used keep them cool in summer and warm in winter. Thermal comfort is supported by having a hearth “orupie” inside at the sitting room.	Houses offer year-round thermal comfort; the materials used keep them cool in summer and warm in winter. The house design does not allow provision of herth “orupie” inside. Users have adopted having a kitchen outside.
	There are implicit understandings of personal space and privacy within housing units. -Certain rituals and practices are held privately to honor individual experiences and maintain confidentiality. - Privacy in the use of the toilets between father, mother and children is highly considered during the construction of their homes. It is rarely and shame to see a father going to the toilet. Toilet is	There are poor consideration of personal space and privacy within housing units. -Currently, there is no suitable environment for rituals requiring high privacy, but efforts are being made to adapt living spaces. -External toilets were provided at the rear side of the house but it allows direct visibility in some areas of the site.

	positioned outside the boma for privacy.	
<i>Materials and construction techniques</i>	Traditional Maasai housing utilizes local materials such as twigs, grass, ash, and cow dung (Fig.4-11)	Utilization of industrial materials such as corrugated iron sheets, blocks were observed at Msomera (Fig 4-17, 4-18).
	Indigenous construction knowledge, considered an intangible heritage, is systematically passed down to future generations in accordance with established norms. Maasai housing is constructed by women as master builders.	Maasai norms are being compromised, and the channels for knowledge transfer are under threat. In Msomera, houses are now being built by specialized contractors.
<i>Spiritual connections and feelings</i>	The existence of shrines, along with the performance of rituals and cultural practices, fosters a profound “ <i>sense of place</i> ” for inhabitants by establishing a spiritual connection to their homesteads (Fig 4-1). This connection is deeply rooted in the traditions and beliefs that shape their community identity.	The absence of rituals and cultural practices in Msomera leaves inhabitants feeling spiritually disconnected from their built environment.
<i>Communal spaces</i>	The communal spaces in Ngorongoro reflect the cultural practices and social structures of the Maasai people, promoting community interactions through gatherings and ceremonies that are closely tied to their pastoral lifestyle and the natural environment.	Communal are more influenced by modern urban planning that emphasize functionality and accessibility over cultural significance.

	Effective use of communal spaces such as drought reserve areas, water and saltlicks for livestock. Seasonal camps “ronjo” are well utilized in a sustainable way (Fig 4-3).	Absence of sustainable communal spaces such as drought reserve areas, saltlicks, and enough water for livestock. Seasonal camps “ronjo” are utilized in communal glazing land but are in danger of being permanent camps due to insufficient spaces for livestock at residential plots. Restriction on use of communal land was observed (Fig 4-12).
<i>Housing Planning</i>	Housing settlement is characterized as an informal settlement.	Housing is defined by a formal settlement created by the Tanzanian government as part of a relocation initiative.
<i>Social services</i>	Poor social services such as water, electricity and roads.	Good provision of social such as water, electricity and roads.
<i>Spatial qualities</i>	Poor light and ventilation (very small windows).	Adequate light and ventilation.
<i>Other external and internal factors</i>	Climate change, conservation efforts, and population growth have transformed the qualities of indigenous buildings due to resource scarcity.	Maasai were required to adapt the design of housing provided to maintain their cultural identity. They began adapting their culture by expanding their living spaces.
	They practice pure pastoralism where farming is prohibited at NCA (Fig 4-2).	Adaptation to crop production was observed. They practice crop production within their residential plots with additional 5hectors for farming activities. Farming is not Maasai culture (Fig 4.21).

4.2.4 Major Architectural challenges identified in the study resettlement

Through in-depth interview, field survey, review of documented literature and analysis using Arc GIS software the study identified the following major architectural challenges.

a) Lack of community participation

Housing and settlement designs were imposed without consulting the community, resulting in layouts and structures that fail to reflect their cultural practices, spatial needs, and lifestyle, which undermines social cohesion and acceptance of the new housing.

b) Social mismatch

There was a major gap observed between the Maasai traditional lifestyle and the new housing and resettlement pattern provided. There is lack of cultural connections in resettled area such as absence of ritual functions and other rite of passage (circumcisions, marriage), lack spiritual sites, lack of ethnomedical sites. This leaves inhabitants feeling spiritually detached from their surroundings.

c) Space mismatch

The Msomera settlement design was incompatible with the Maasai's traditional spatial needs, failing to consider their pastoral lifestyle, polygamous family structures, and communal living patterns. Houses lacked space and security, with inadequate residential plots that could not accommodate both people and livestock, leading to conflicts. Many plots were converted to agriculture, further challenging livestock management, cultural practices, and social cohesion among the Maasai community.

d) Spatial mismatch

The spatial mismatch at Msomera arises from a relocation design that conflicts with Maasai communal, pastoral, and cultural practices. The imposed grid layout disrupts their traditional circular homestead arrangement, while small residential plots limit space for cattle kraals and family growth, compromising livestock and human security. Poor location, layout, and orientation of homesteads, combined with limited water and grazing resources and existing communal land use, further undermine the Maasai's way of life and needs.

e) Materials and construction techniques

One major architectural challenge in the Msomera resettlement is the shift from traditional Maasai materials to industrial construction materials. At Ngorongoro, traditional materials were used, which hold cultural significance and suit Maasai lifestyle, but Msomera relies on industrial materials that often ignore these cultural values and practical needs, leading to a loss of cultural identity and unsuitability for Maasai living conditions.

f) Climatic difference of between the original and new resettlement area

The study by Mwabumba, et al. (2022), shows that Ngorongoro experiences heavier rainfall and a cooler, wetter climate due to its higher altitude and frequent precipitation. Furthermore, the study by Ripkey et al., (2021), shows that there is a climate variability in Handeni Tanga among pastoral communities which resulted warmer and drier condition. The studies show that Msomera is warmer and drier, whereas Ngorongoro is cooler and wetter.

Through interview and review documented literature this study revealed that the climate of Ngorongoro provide good thermal comfort for Maasai housing than Msomera. The study by Samuel et al. (2017), shows that the use of local materials such as sticks, mud, cow dung, and dry grass provide the ability to balance the indoor temperature. The walls slowly absorb heat by day and release it at night, while cow dung seals gaps to retain warmth during Ngorongoro's cold nights. The roof, made of dry grass or thatch, provides good insulation against both heat loss and rain.

In Msomera, relocated Maasai reported discomfort in modern houses, feeling excessively hot during the day and cold at night. This made the users to modify their spaces and construct new small houses where they can use hearth "Orupie" to provide heat inside. This implies that the use of industrial materials for construction of Maasai housing at Msomera are not responsiveness to the climate of the given area. Industrial building materials, though durable, often lack climatic adaptability, causing excessive heat retention and noise, especially under harsh weather conditions (Samuel et al. (2017).

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature °C (°F)	16.8 °C (62.2) °F	17.3 °C (63.1) °F	17.2 °C (62.9) °F	16.5 °C (61.8) °F	15.7 °C (60.3) °F	14.8 °C (58.7) °F	14.4 °C (57.9) °F	15.2 °C (59.3) °F	16.5 °C (61.6) °F	17.3 °C (63.1) °F	16.9 °C (62.4) °F	16.6 °C (61.8) °F
Min. Temperature °C (°F)	11.7 °C (53.1) °F	11.8 °C (53.2) °F	12.5 °C (54.5) °F	13.1 °C (55.6) °F	11.9 °C (53.5) °F	10.3 °C (50.5) °F	9.2 °C (48.6) °F	9.9 °C (49.7) °F	10.6 °C (51) °F	11.7 °C (53.1) °F	12.3 °C (54.2) °F	12.1 °C (53.7) °F
Max. Temperature °C (°F)	22.3 °C (72.1) °F	23.2 °C (73.7) °F	22.7 °C (72.9) °F	21.2 °C (70.2) °F	20.4 °C (68.7) °F	20 °C (68) °F	20.1 °C (68.2) °F	21 °C (69.8) °F	22.6 °C (72.7) °F	23.2 °C (73.8) °F	22.3 °C (72.1) °F	21.8 °C (71.2) °F
Precipitation / Rainfall mm (in)	742 (29)	420 (16)	557 (21)	319 (12)	85 (3)	18 (0)	9 (0)	10 (0)	15 (0)	69 (2)	343 (13)	893 (35)
Humidity(%)	77%	71%	77%	83%	77%	71%	66%	63%	59%	60%	74%	80%
Rainy days (d)	15	13	15	18	11	3	1	1	2	6	14	17
avg. Sun hours (hours)	8.3	8.9	7.6	6.3	6.3	6.6	7.2	7.6	8.8	8.8	7.7	7.4

Figure 4-27:Climate: Weather data of Ngorngoro (Source: Mwabumba et al. (2022))

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec	Year
Record high °C (°F)	39.86 (103.75)	39.86 (103.75)	39.86 (103.75)	36.62 (97.92)	34.47 (94.05)	34.47 (94.05)	33.39 (92.1)	32.32 (90.18)	33.39 (92.1)	35.55 (95.99)	36.62 (97.92)	37.7 (99.86)	39.86 (103.75)
Average high °C (°F)	34.94 (94.89)	35.18 (95.32)	35.34 (95.61)	33.67 (92.61)	31.39 (88.5)	30.75 (87.35)	30.23 (86.41)	30.45 (86.81)	30.97 (87.75)	32.11 (89.8)	33.26 (91.87)	34.71 (94.48)	32.75 (90.95)
Daily mean °C (°F)	31.34 (88.41)	31.59 (88.86)	32.03 (89.65)	30.85 (87.53)	28.97 (84.15)	28.01 (82.42)	27.36 (81.25)	27.61 (81.7)	28.15 (82.67)	29.17 (84.51)	30.31 (86.56)	31.34 (88.41)	29.73 (85.51)
Average low °C (°F)	26.22 (79.2)	26.36 (79.45)	26.99 (80.58)	26.54 (79.77)	25.32 (77.58)	23.97 (75.15)	23.14 (73.65)	23.33 (73.99)	23.78 (74.8)	24.6 (76.28)	25.15 (77.27)	25.92 (78.66)	25.11 (77.2)
Record low °C (°F)	23.7 (74.66)	23.7 (74.66)	20.47 (68.85)	16.16 (61.09)	21.54 (70.77)	15.08 (59.14)	20.47 (68.85)	21.54 (70.77)	21.54 (70.77)	21.54 (70.77)	22.62 (72.72)	23.7 (74.66)	15.08 (59.14)
Average precipitation mm (inches)	59.47 (2.34)	43.47 (1.71)	120.78 (4.76)	247.7 (9.75)	227.41 (8.95)	40.82 (1.61)	47.34 (1.86)	53.38 (2.1)	66.23 (2.61)	144.4 (5.69)	128.19 (5.05)	91.44 (3.6)	105.89 (4.17)
Average precipitation days (≥ 1.0 mm)	10.48	7.44	19.68	25.56	22.43	10.38	11.06	11.75	14.79	16.35	20.66	19.39	15.83
Average relative humidity (%)	79.16	78.89	78.72	80.23	82.82	79.24	79.26	80.49	81.04	82.37	82.47	79.79	80.37
Mean monthly sunshine hours	12.1	12.05	11.85	11.64	11.6	12.02	11.95	12.02	11.8	12.09	13.17	12.18	12.04

Figure 4-28:Climate data of Msomera-Tanga (Source: Mwakalonge 2023)

4.2.5 Summary of Maasai Traditional cultural values

The finding of this study has Maasai tribe has their unique traditional architectural values with cultural significance in their housing design. It identified the unique traditional Architectural values of Maasai architecture and other architectural values in contemporary setting which was observed at the relocated zone of Msomera. Maasai housing new settlement at Msomera observed to lack unique cultural values as evidenced by trying to adopt their living spaces (Fig 4.20-4.26).

This study reveals the following distinct cultural values that characterize the indigenous Maasai Tribe as illustrated in table 3 below:

Table 4-2: Summary of Maasai Traditional cultural values

	Maasai Traditional cultural values
01	The Herth “Orupie”
02	The Privacy in Maasai • Spaces to accommodate their ritual functions (Indoor and outdoor) • Community perception on use of toilets
03	Maasai practice on polygamy structure
04	Livestock enclosure as a focal point of design
05	Significant of courtyard
06	Security
07	Orientation of Maasai homestead “boma”
08	Housing style and form
09	Use of local building Materials
10	The Maasai patriarchal structure
11	Maasai adaptation to new environment
12	Spiritual sites
13	Ethnomedical sites
14	Pastoralism Life style • Livestock enclosure • Glazing land for pasture • Water sources • Saltlicks • Reserved glazing area away from home “Ronjo” (10km) • Reserved glazing area nearby home “Alalili” • Unrestricted glazing area surrounding homestead

4.3 Influence of Traditional Maasai cultural values on Housing architecture

This section seeks to explore the influence of traditional Maasai cultural values on Maasai architecture, highlighting how these values are deeply intertwined with the distinctive characteristics of their architectural style. To explore the influence of traditional Maasai cultural values on housing architecture, the study adopted a qualitative research approach incorporating in-depth interviews, field and participatory observations, focus group discussions (FGDs), and literature review. The following traditional cultural values were observed:

4.3.1 The hearth “Orupie”

The field survey at Ngorongoro revealed the existence of heart “Orupie” as the important cultural value in Maasai architecture. The hearth is centrally located within the house and is an integral part of the living space, closely linked to the sitting room, emphasizing its importance in daily family life. The primary observation revealed that the Maasai hearth, known as "orupie," serves two main functions: cooking and providing warmth to the home. When cooking is finished in the evening and people head to bed, most do not extinguish the fire; instead, they cover it with ash, allowing it to smolder until morning when the fire is reignited.

However, the new housing at Msomera lack the provision of hearth “orupie” as an important cultural value for Maasai. The implementing authority has enforced a strict ban on using firewood in the main house to prevent respiratory diseases and to uphold the home's aesthetics. Consequently, many households have turned to building separate outdoor kitchens. This creates a notable disconnect between the housing design and the actual needs and lifestyle of the Maasai community.

One informant emotionally shared his feelings about the loss of this important cultural element in the new house designs.

“The hearth is vital for providing warmth in our homes and serves as a key space for socializing, storytelling, and passing down Maasai traditions to younger generations. Currently, we cannot have a hearth inside our house due to restrictions aimed at preventing air pollution. As a result, we've built an external kitchen, but it is located far from our bedrooms. In future constructions, we intend to incorporate the hearth into the design to enhance our comfort”.



Figure 4-29a: Maasai hearth "Orupie" at Ngorongoro-Source (Sharp and Twati 2017)

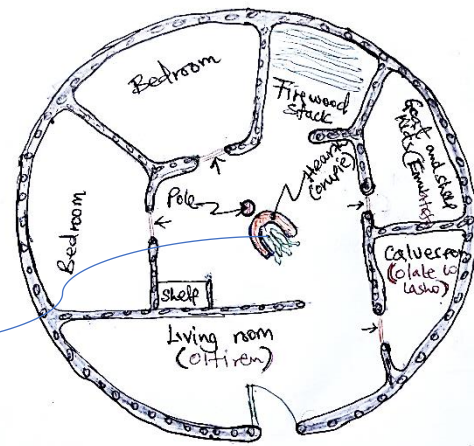


Figure 4-30b: Maasai hearth "orupie" floor plan at Ngorongoro-Source (Author 2024)

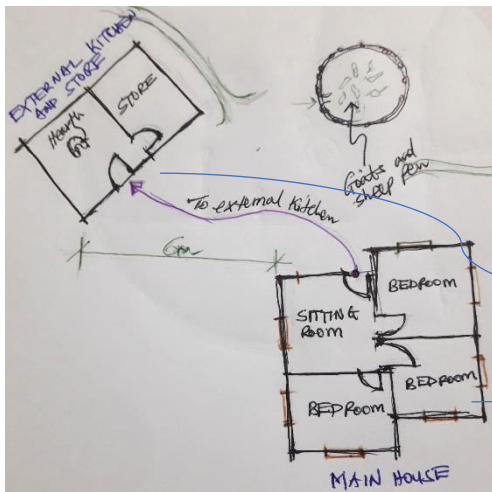


Figure 4-31: Location of Herth "Orupie" at Msomera-Source: (Author 2024)

4.3.2 The Privacy in Maasai

Privacy is defined as having the ability to keep the human prevented from being observed or interrupted by others visually and socially (Abed et al. 2023). A key function of privacy is to support individual self-identity by establishing personal boundaries. *“Across all cultures: privacy is a central concept that provides a bridge between personal space, territory, realms of social behavior ... [and] is an interpersonal boundary regulation process by person or group regulates interactions with others”* (Kellett, 2016: 216).

Privacy operates on multiple levels: between individuals, between and within neighbors and larger group (Kellett 2016).

Privacy has observed as one of the significant aspects of Maasai traditional cultural values. The Maasai culture is strongly based on communal living and social structures, emphasizing the importance of respecting both personal and communal boundaries. In the housing study on the relocation of the Maasai from Ngorongoro to Msomera, privacy was critically examined in the concept of homestead layout and overall use of spaces. These include spaces to accommodate ritual functions and Maasai community perception and use of toilets.

a) Spaces to accommodate their ritual functions

The arrangement of these units demonstrates an implicit understanding of personal space and privacy. For example, some rituals and practices are performed in private settings, showing respect for individual experiences and confidentiality. These rituals are performed indoor and outdoor setting.

- *Indoor rituals:* Several cultural activities and rituals known as “Ndaasa” are also carried out in the traditional Maasai house. Cultural rituals and taboos transform the traditional Maasai house into a versatile space. It functions as a labor room for childbirth, a healing area for circumcised boys and girls (noting that boys have a temporary healing house), a space for family reconciliations, and a venue for ceremonial cleansing. Furthermore, it is used for bride price negotiations and as an altar for blessings.
- *Outdoor rituals:* The cattle knaal is the site of the ritual called “olokor”, serving as a venue for prayers, blessings, family gatherings, and celebrations. Its entrance, known as “kishomi o nkishu,” is significant for Maasai cultural practices, particularly the right side where boys' circumcision, blessings, and other rites of passage occur.

However, it was also observed that the design of housing at Msomera lack these components of design to enhance Maasai cultural values. This is according to non-participatory design approach used in housing provision.

b) Maasai community perception and use of toilets.

Through interviews and observations conducted at Ngorongoro, the study revealed that the use of toilets is not a priority for the Maasai community. There exists a strong perception regarding toilet use, which is closely tied to their need for privacy. While temporary toilets are available

for family use, they are situated some distance away from the homestead's fence and are often unused due to the community's lifestyle. Furthermore, the study found that it is considered culturally inappropriate for an adult to be seen by a child while defecating. This belief has led children to think that their father does not use the toilet.

Maasai community at Msomera were provided with pit latrines with bathroom located closely at the rear side of the main house (Fig 4.28).

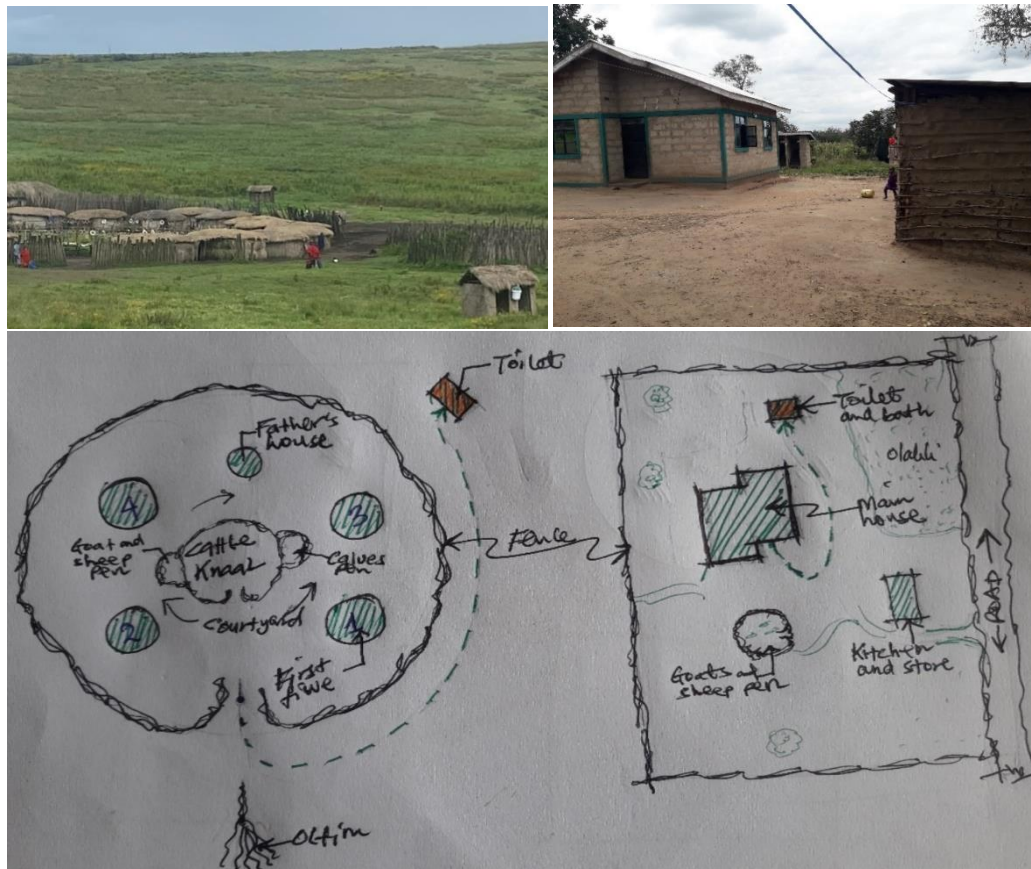


Figure 4-32: Homestead layout at Ngorongoro and Msomera Handeni Tanga-Source (Author 2024)

4.3.3 Maasai practice on polygamy structure

The Maasai Tribe practices polygamous marriages, allowing a man to have multiple wives. Their dwelling, called the “enkang”, is designed to accommodate these family structures. Polygamy is seen as a means to enhance wealth and social status. Each wife has her own house with her children, while the father, as the family leader, has a separate house. A father may stay in one of his wives' homes for temporary basis, typically until the children reach circumcision

age, around 15 years, at which point he must leave to maintain privacy. At Msomera it is observed that one house hold had more than one wife with their children in a single house.

4.3.4 Livestock enclosure as a focal point of design

The Maasai livestock enclosures consist of the cattle kraal, or "Boo o nkishu," along with the calves' pen "olale lo lasho" and the goats and sheep pen, known as "Emwatata o ndare o ngerak." (Fig 4.29). Following traditional guidelines, goat and sheep pens have a diameter one-third that of the cattle kraal, while calves' pens are typically one-quarter the diameter. The cattle kraal, central to the homestead's design and rooted in Maasai folklore, holds sacred significance as the site of the "olokor" ritual for prayers, blessings, and celebrations. Its entrance, "kishomi o nkishu," is vital for cultural practices, particularly for rites of passage like boys' circumcision. This underscores the kraal's role as a key center of Maasai cultural identity and community life.

The significance of the cattle kraal was not only important to the Maasai of Ngorongoro but also to those who were relocated to Msomera. These families moved with their livestock, including cattle, goats, sheep, and donkeys. This relocation required them to create new livestock enclosures. However, this approach presents challenges due to limited space and poorly designed enclosures that lack adequate security. Some households struggle to accommodate their cattle within their residential plots, especially those with larger herds. As a result, they often leave their cattle on communal land, keeping only goats and a few cattle at home.

4.3.5 The significance of courtyard

The courtyard, known as "Alamanaa," serves as a vital gathering space within the homestead for family and community members, facilitating social interactions, rituals, and communal events. Surrounded by livestock enclosures, including the sacred cattle kraal, it emphasizes the interconnectedness of daily life and cultural practices among the Maasai, functioning as a crucial contact zone between humans and livestock (Fig 4.29).

The current housing organization in Msomera lacks the concept of a courtyard. Nevertheless, some households are attempting to adapt their living spaces to align with their cultural values. The main challenge they encounter is the insufficient space to accommodate these needs. Moreover, the current design greatly impacts the success of the adaptation process because the project design team has set a central focus for housing design.



Figure 4-33: Courtyard at Maasai cultural boma at Ngorongoro-Source (Author 2024)

4.3.6 Security

In a traditional Maasai house, fences, homestead units, and livestock enclosures are organized in three concentric layers to enhance protection against predators and prevent animal attacks (Fig 4.29). Most of Maasai houses are surrounded by thorn fence as the integral part of the construction of their boma. These circular enclosures not only safeguard livestock but also represent the community's deep connection to their pastoral way of life and cultural identity. Security is also enhanced through entrances. Entrances in Maasai homestead is:

Main entrance “Kishomi” Entrance to cattle knaal “Kishomi o nkishu” and main entrance to the house. They are strategically positioned and constructed to enhance security and facilitate the movement of people and livestock. The symbolic twig “oltim” is used to close the main entrance. The symbolic twig “oltim” also has cultural significance as it represents the homestead elder.



Figure 4-34: Main entrances at Ngorongoro and Msomera-Source (Author 2024)

It was further observed that houses at Msomera lack some of the traditional architectural elements of security. Only few households have tried to adopt their living spaces to enhance their security. Some households visited lack security for their livestock and throughout the entire compound. Livestock enclosure is positioned very close to main roads connecting the residential plots.

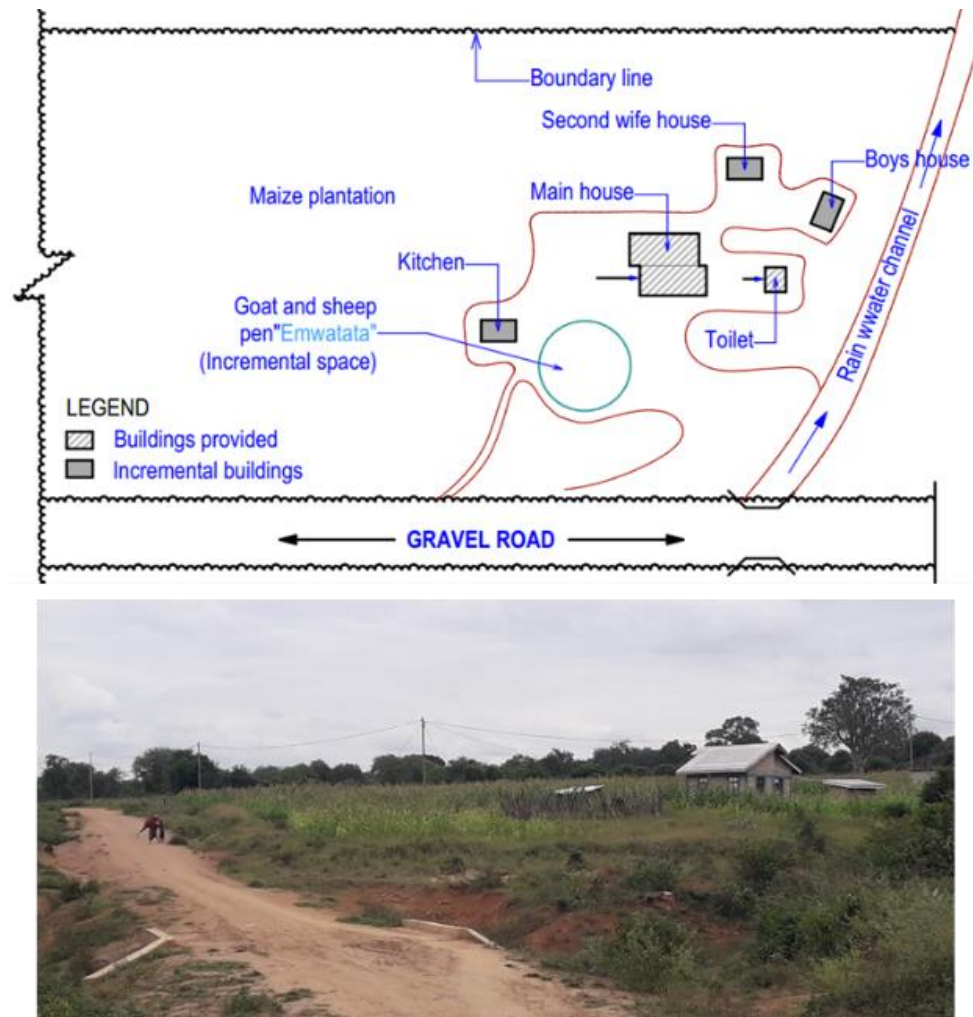


Figure 4-35: Poor security for one of the households at Msomera (Source: Author 2024)

4.3.7 Orientation of Maasai homestead “boma”

The location and layout of Maasai homesteads are shaped by the cultural axis referred to as "Kopkop," which ultimately determines where the primary entrance, known as "kishomi," is situated (Fig 4.4). The orientation of Maasai boma typically does not face the direction of sunrise and sunset. This cultural axis “Kopkop” dictates various rituals performed within the homestead. The axis divided the homestead is into two sections: "entaloishu e tatene," which is established by the first wife, and "entaloishu e kedyange," which is established by the second wife as well. The extra wives alternate on both sides according to a set cultural sequence. The main ntrance, the knaal "boo o nkishu," and the symbolic twig "Oltim," are all connected by

the axis. The housing layout and orientation of housing at Msomera were configured based on the designer's ideas and concepts.

4.3.8 Maasai Housing style and form

In Ngorongoro, the three major types of indigenous houses include the cow dung house ("enkaji emodioi"), the round thatch house ("enkaji orkujita"). The physical qualities are shaped by indigenous design principles that stem from the environment, cultural beliefs, social connections, and folklore. The Maasai homestead at NCA experiences gradual organic growth through the adaptive nature of their traditional lifestyle, enabling incremental expansion and modification of living spaces in response to changing environmental conditions and social needs.

The round thatch houses have dominated in Ngorongoro. The Maasai housing style and forms are not only practical structures but also have symbolic meaning. The layout of the houses in the village and the central space shows the importance of cattle at the heart of Maasai culture and livelihood. The overall building form of the Maasai in Ngorongoro is designed to protect against natural disasters like strong winds and to provide security from wild animals, with thoughtfully placed entrances that enhance community safety and cohesion.

The Maasai houses at Msomera embody a contemporary design characterized by simplicity and functionality, making them an affordable housing option. Constructed with modern materials, these homes feature thoughtfully designed floor plans that prioritize practicality while maintaining a low-cost approach. This innovative blend of traditional influences and modern construction techniques results in a housing form that is both accessible and aesthetically pleasing.

4.3.9 Use of local building materials

The Maasai homestead, referred to as "enkang," in the Ngorongoro Conservation Area (NCA) is constructed by women utilizing locally sourced materials like sticks, mud, cow dung, and dry grass (Fig 4.11). These resources are abundant and sustainable in the Ngorongoro region, showcasing the Maasai's profound connection to their natural environment.

The architectural style of the Maasai houses at Msomera incorporates modern materials and construction techniques to create durable and functional living spaces (Fig 4.17). Sanded floors

ensure stability, while plastered block walls offer an appealing surface. Corrugated steel sheets form a waterproof roof, enhanced with concrete for a polished appearance. Grilled doors enhance security and ventilation, and metal windows allow for light and airflow. Furthermore, the integration of electricity and a drinking water system promotes the comfort and well-being of the community.

4.3.10 The Maasai patriarchal structure

Maasai society is characterized by a strong patriarchal structure, with men holding most of the power and authority. This system affects decision-making and property management, placing men as the primary leaders, while women, despite their important roles in the family and society, often play secondary roles. Despite their secondary role, women are responsible for construction of their houses. They are called master builders. In this patriarchal society, the male head of the household typically makes the decision to relocate to Msomera. Consequently, some fathers left their wives behind in NCA because they were not ready to move, while others relocated alone. These necessitated some households to have two separate families.

4.3.11 Adaptation to new environment

The Maasai's relocation from Ngorongoro to Msomera has spurred a significant adaptation in their architecture, reflecting their unique cultural values of resilience and flexibility. Although the Maasai were initially provided with only a main house and an external toilet, they began to expand their living spaces by constructing additional houses and livestock enclosures while maintaining individual grazing areas close to their residential plots (Fig 4.21-4.27). They also started practicing cultivation within these plots. Their adaptation to the new environment was influenced by the vision of the original designer and the available space to accommodate their families, livestock, and overall livelihoods. However, this adaptation led to challenges for some households, resulting in poorly organized housing that compromised security and privacy. Most of the new homes reflected contemporary designs, while in other cases, the Maasai utilized local materials to better suit their environment.

4.3.12 Maasai coexistence with wildlife

The observation revealed that the Maasai coexist with wildlife in the NCA. They can move freely and confidently without fear of predators, demonstrating a strong respect for nature. This practice is unique only to Maasai people within NCA. However, there are instances where wild

carnivores attack people or livestock due to the interactions between humans and animals. Wildlife like buffalo and zebra sleep near Maasai homesteads "bomas," at night for protection against predators. This situation makes them to construct their homes to enhance security against these wild animals.

The relocated zone of Msomera is free from wild animals. Maasai are now interacting with their livestock and other tribes within the area. Adaptation to enhance security was seen to be ideal but is not critical compared to Ngorongoro due to fear of wild animals. Most houses have no fence and few ones were secured using normal materials.

4.3.13 Spiritual connection to landscape.

It was found that, the Maasai landscape provides pasture, water, and salt, and is crucial for their cultural identity and spiritual practices. Important natural features, such as Mount Oldoinyo Lengai the "Mountain of God" are revered for their religious significance. This sacred site is used for prayer, fertility rituals, and healing, and the Maasai believe its eruptions indicate their deities' disapproval. The context of Msomera lacks a spiritual connection to the landscape, while the Maasai are attempting to adapt to the environment.

4.3.14 Ethnomedical sites

Maasai society has cultural knowledge regarding health and illness management. There are natural sites which include locations where traditional healing practices occur and where medicinal plants are found. Maasai use these sites to get medicinal plants for business purposes to enhance their livelihood. The quality of medicine varies depending on the location and type of species at specific location. It was noted through interviews that there is a scarcity of herbal medicine in terms of quantity and quality of these products as argued by one of the households at Msomera:

One of the businesses I rely on for income is selling herbal products, a venture I've been involved in for quite some time. While we do have herbal medicine available here in Msomera, we've discovered that it isn't as effective for treatment compared to what's available in Ngorongoro. As a result, I occasionally need to travel to Ngorongoro to source higher-quality products that meets my customers' needs.

4.3.15 Maasai pastoralism life style

Maasai are nomadic pastoralism who have maintained their traditional lifestyle centered around herding livestock, including cattle, goats, and sheep. This nomadic lifestyle is closely linked to their cultural identity, as they depend on their livestock for sustenance. This part compared pastoral life style at Ngorongoro and Msomera and showed how it influenced the architecture of Maasai at Msomera. Owning cattle is a key symbol of wealth and social standing in the Maasai community. The number of livestock owned by each household can differ greatly depending on individual circumstances such as wealth, social status, and environmental conditions.

Traditionally, the Maasai at Ngorongoro maintain a permanent livestock enclosure at home, where livestock are herded to grazing land in the morning and returned in the evening. However, exceptional circumstances may arise when livestock need to be herded for extended periods, which typically occurs when utilizing reserved grazing land, known as "ronjo," located 8 to 10 kilometers from home. In such cases, herding may continue for several months as they search for green pastures, salt licks, and water sources.

At Msomera due to insufficient space, many households are unable to accommodate a large number of livestock on their homestead. As a result, they have adopted to increase their spaces by building small enclosures for a few animals, such as sick animals, goats, and sheep. However, their layout interferes security of livestock. The remaining livestock are herded and kept on communal grazing lands and designated reserve areas for grazing, referred to as "ronjo." A large number of livestock remained at communal land for a long period of time without coming back home.

4.3.16 Maasai Communal land ownership

Through observation, it was observed that the Maasai in the Ngorongoro Conservation Area (NCA) embrace a concept of communal ownership, where land tenure is regulated by native laws and customs. The Maasai structure themselves into smaller communities called ngutot (neighborhoods) to effectively manage their land and resources. They communally manage the utilization of pasture, water sources and mineral licks.

There is a reserve pasture (Alalili) located near their homestead to which is used to accommodate young and weak animals during droughts season. This pasture can be owned by individual person or shared among several bomas (homestead) including their children and

wives. Any area surrounding the homesteads that is not designated as Alalili is utilized with minimal restrictions throughout the year. There is also a zoned general reserve area for all occupants which is usually located 8-10km from their settlement and it provide access to all members of the community. Given that the reserve can extend several kilometers from permanent settlements, seasonal camps (ronjo) are permitted to facilitate efficient pasture utilization during this time (Fig 4-3). The reserves contain permanent water sources and salt licks either within the area or in close proximity. The Maasai take care of land and natural resources using traditional groups formed by age and clans, with elders and leaders (laigwanak) in charge of managing pastures, salt licks, and shared water sources.

In Msomera, most of the land is privately owned, but there are also areas for everyone to use together. There are spaces for buildings, open areas, artificial ponds, markets, and an auction yard. Each household has a residential plot of 2.5 hectares and 5 hectares for farming, with many residents using part of their plots for growing crops. There is grazing land about 8 km from the center of Msomera, where livestock can be herded. Because there isn't enough water, water points have been set up in the grazing area to help the animals stay hydrated. There are no designated areas for salt licks. To manage the grazing land better, temporary camps called "ronjo" have been established. It was noted that the area lacks enough space for reserve pastures (Alalili) to support young and weak animals during droughts. The residential plots are enclosed, which isolates each household on its own piece of land. Both Maasai pastoralism life style and Maasai Communal land ownership has shown challenges on their architecture as expressed by one of the head of household:

I am a pastoralist whose primary income comes from a large herd of livestock, but my current area cannot support them all. To manage this, I am temporarily reducing my herd size, keeping some livestock in Msomera where I live with my first wife, while relocating others to Kilindi, where my two other wives reside in affordable houses with additional livestock. I take advantage of the larger living space and grazing land in Kilindi and visit them periodically.

4.3.17 How communal land alterations influenced Maasai Architecture

This section presents the results of the classification of the land use from the satellite imagery, conducted on the years 2013, 2015, 2018, 2020, and 2023. These years were strategically considered at intervals of time that could potentially represent significant shifts or change in

land use patterns. The years were selected because for those years, the images were relatively free from cloud cover, which is necessary to properly compare the change of land use pattern urban growth. This process classified four primary land cover classes within the study area; which are water features, bare land, dense vegetation, and weak vegetation, where each class describes a distinct component of the landscape.

4.3.17.1 Water Features

All water bodies like lakes, rivers, reservoirs belong in this class of features. They support vital ecosystem functions such as water supply, microclimate regulation, and biodiversity. This analysis showed that there are water features undergoing changes, which can be related to different factors, like seasonal variation, affected by climate change and close human activities

4.3.17.2 Bare Land

Virtually no vegetation appeared was termed as bare land. And these are areas where there is often bare soil, rock or built environment. Temporal information represents expansion and reduction of bare land, which may reflect urbanization and land desertification processes through land degradation process

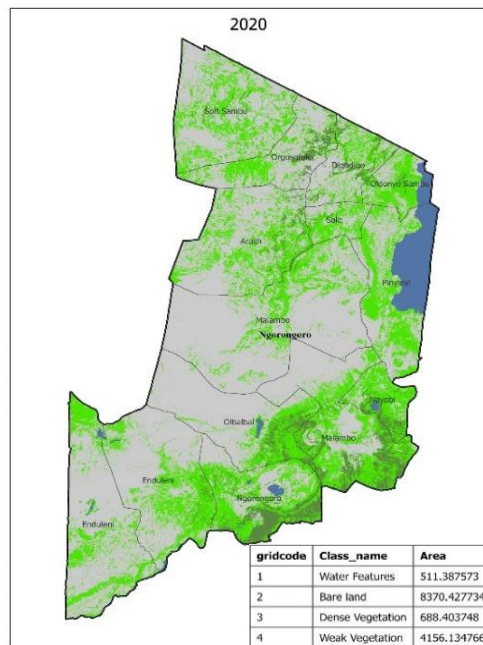
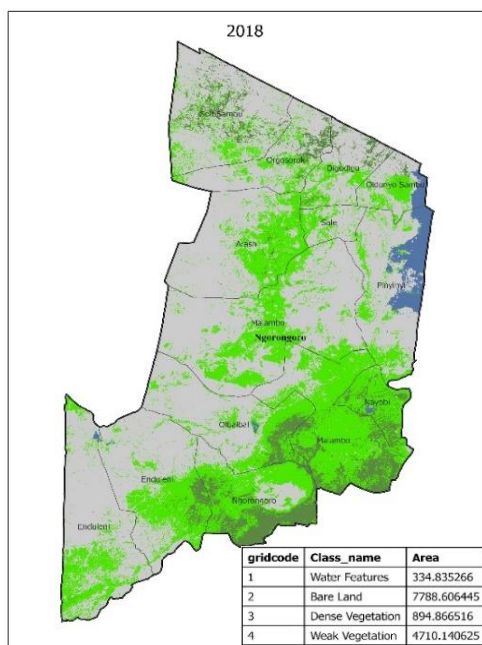
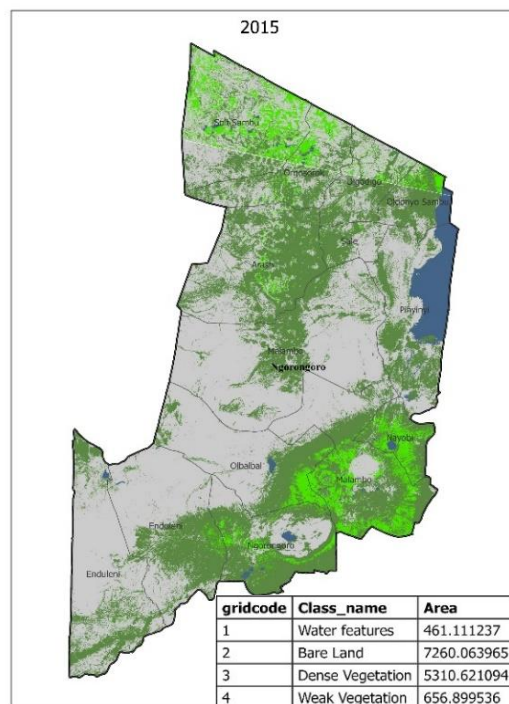
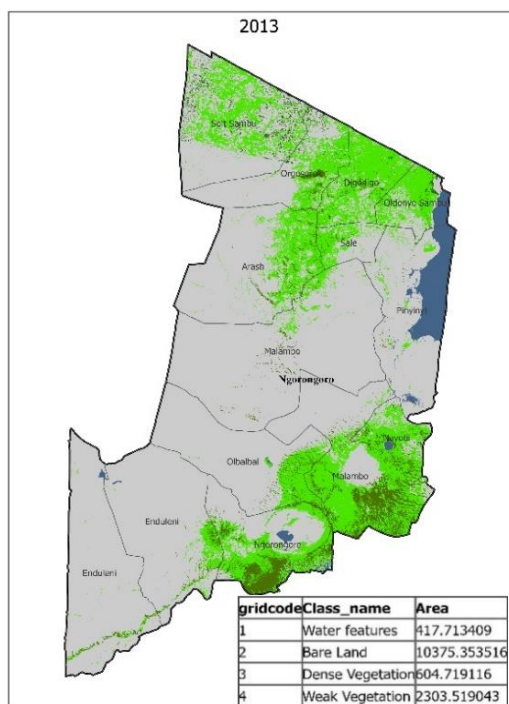
4.3.17.3 Dense vegetation

Areas with full canopy cover, tall trees and shrubs and likely more stable mature ecosystems. Vegetation dense zones are important for carbon sequestration, temperature moderation, and habitats for wildlife. The classification results reflect that green space in the matrix of the urban region and how they changed over the years of the study period.

4.3.17.4 Weak Vegetation

This class represents grassland, agricultural fields and sparse vegetation, and serves to illustrate land use types as well as a measure on the human management intensity. The fluctuation in broad patterns of low vegetation is indicative of agriculture cycles, urbanization and conservation efforts.

4.3.17.5 Results of Land use form at Ngorongoro and Msomera.



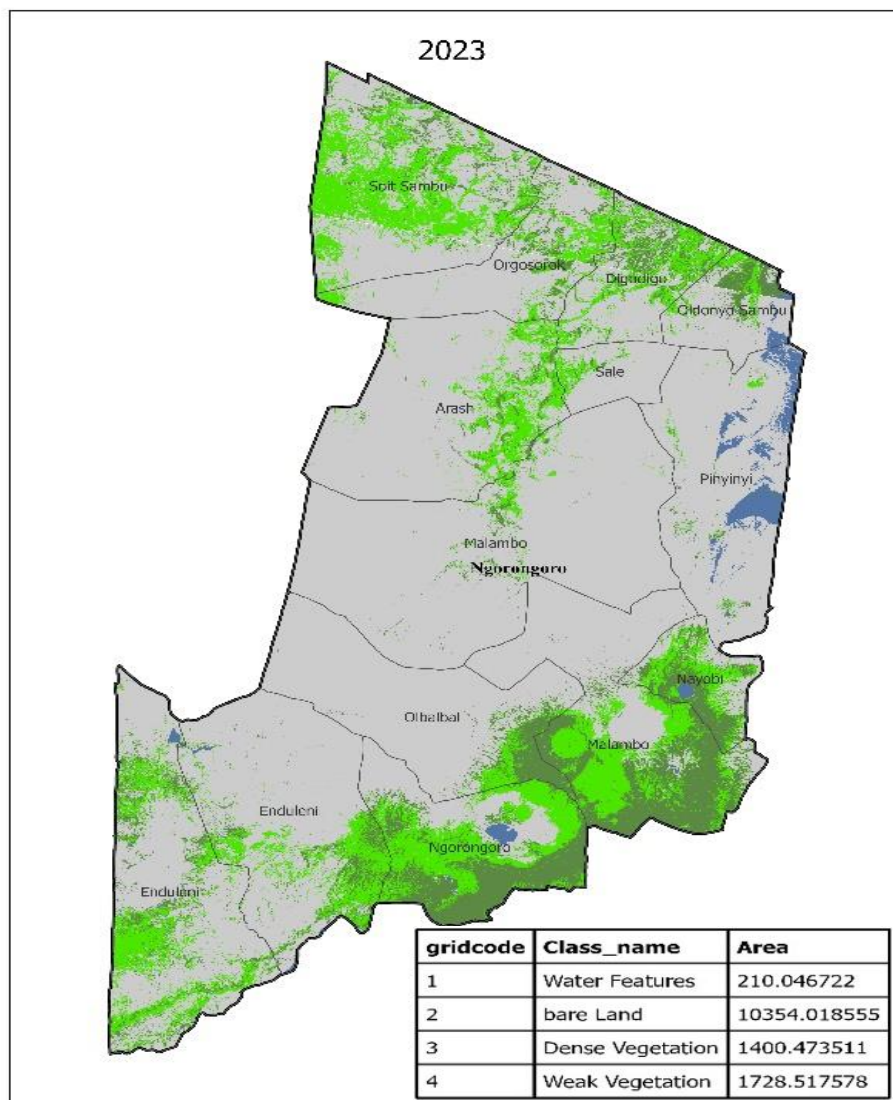
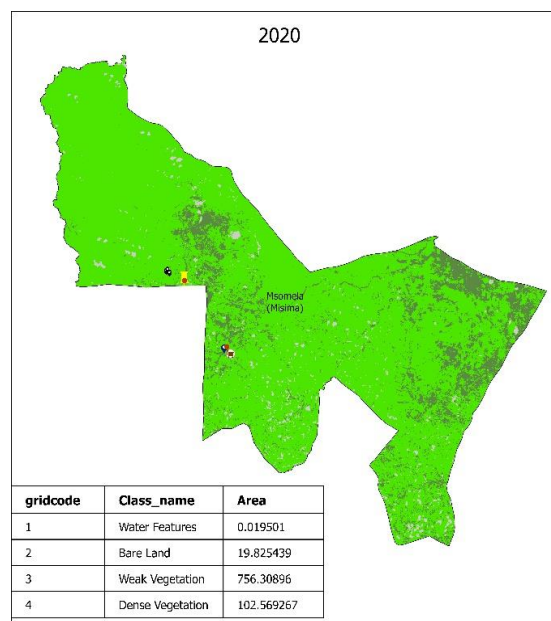
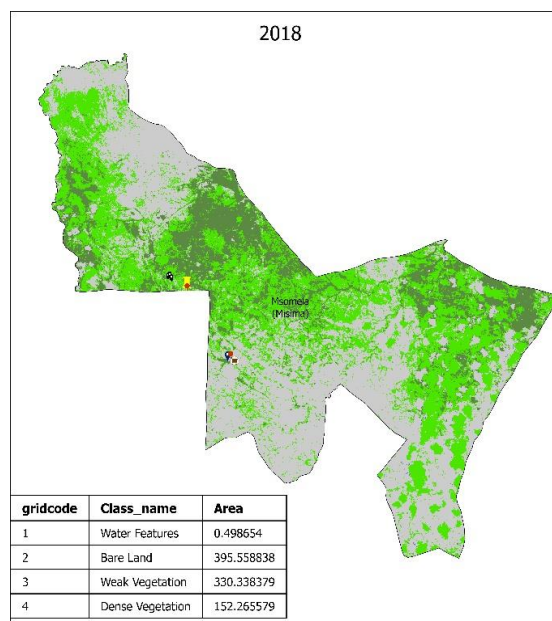
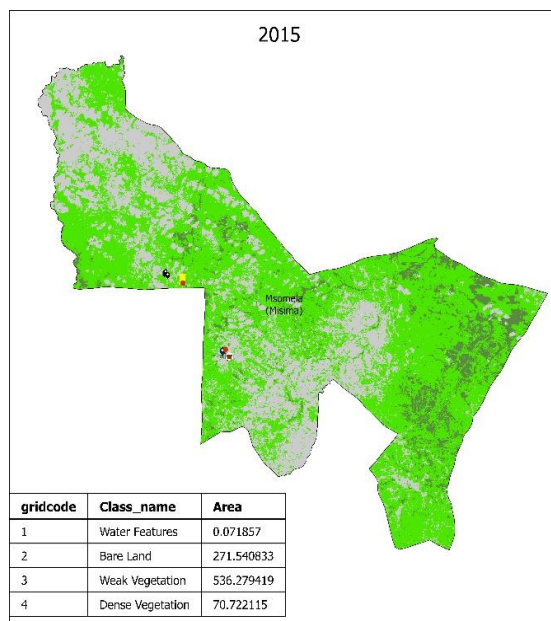
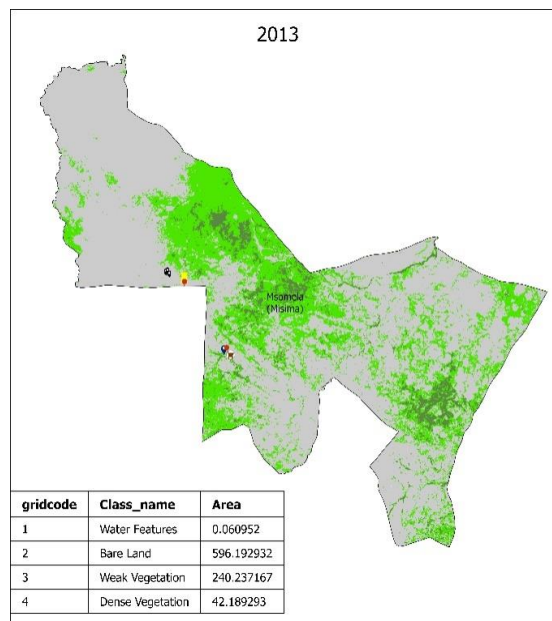


Figure 4-36: Ngorongoro land use pattern of 2013, 2015, 2018, 2020 and 2023 respectively



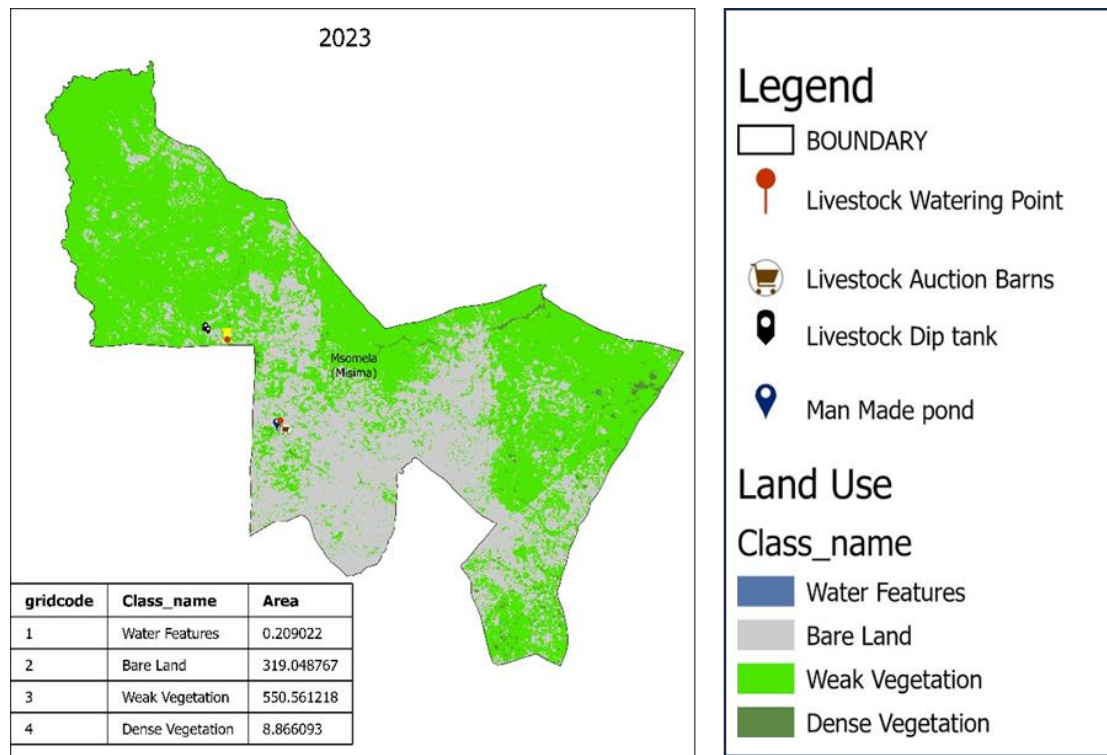


Figure 4-37: Msomela land use pattern of 2013, 2015, 2018, 2020 and 2023 respectively

The classification results of the land use from Figure 4-36 and Figure 4-37, shows the changes by expansion and reduction of water features, dense vegetation, weak vegetation, and bare land which have extensive consequences on Maasai traditional livestock grazing with wildlife significant implications for the cultural practices of the Maasai people. The outcomes are described as follows:

a) Water Resources

The decrease in water features Figure 4-37, means that water is harder to come by which in turn means that the Maasai people have to travel further for water for their herds, which can lead to disputes over water resources

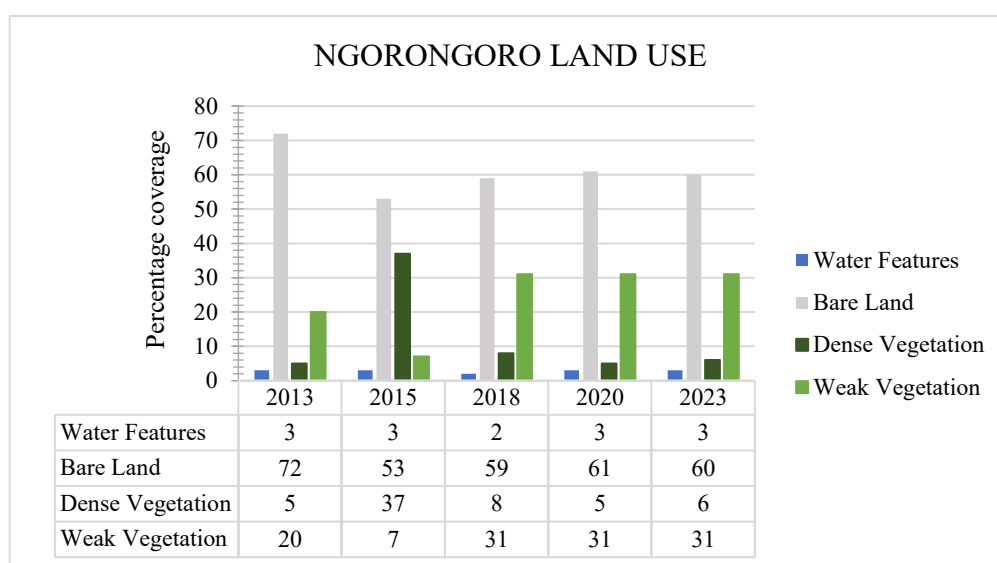
b) Vegetation changes

The loss of dense vegetation led to loss of valuable grazing areas hence overgrazing and encouraging the process of land degradation. On the other hand, an increase in woody vegetation may signal change from traditional grazing pattern towards sedentary

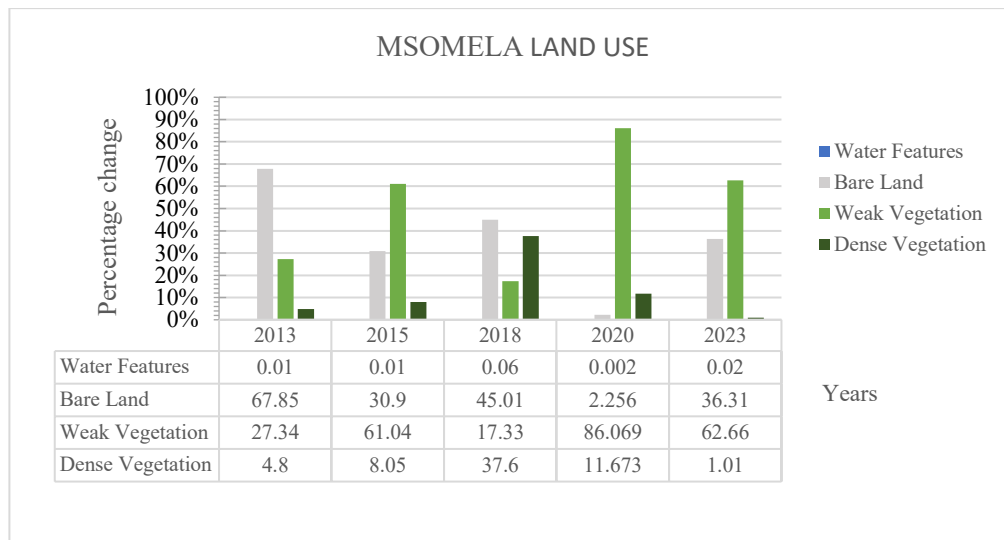
agriculture. Also, the increase of dense vegetation ensures wide range for their local grazing practices.

c) Bare land expansion

A rise in the percentage of bare land can indicate urban sprawl or extensive agricultural operations - both of which can fragment habitats and disrupt only partially, or characterize fully, the scale and intensity of the land available for grazing. This could force the Maasai to change their traditional migrations and in if affects, some of their traditional ways of life.



Graph 4-1: Ngorongoro Land use Dynamic graph



Graph 4-2: Msomera Land use Dynamic graph

4.4 Design approaches of Modern Housing in Msomera-Tanga

The finding of this section aims to give insight on the design approach used on housing development at Msomera and how do they address the needs of the local community. To understand the design approach used in design of housing at Msomera, it was crucial to conduct interviews with authority of NCA, technical personnel and few members of the Maasai community. The interview purposively included: the project manager overseeing the relocation project at Msomera (senior ecological officer) from the NCA, professionals from Ministry of Natural Resource and Tourism: Architect, Engineer, Town planner, Land surveyor along with seven household leaders from Msomera. Interview with the relocation project manager provided valuable insights into the real approach on housing provision, given their pivotal role in the resettlement initiative. This project is under supervision of Ministry of Natural Resources and Tourism. The project target is to construct 5000 houses which include: 2500 houses in Msomera, 1500 houses at Kitwai B-Simanjiro and 1000 houses at Saunyi Kilindi.

Housing design approach

The government utilized technical personnel from the Ministry of Natural Resources and Tourism to create a comprehensive housing design at Msomera. This initiative involved various professionals, including town planners, land surveyors, architects, engineers, and quantity surveyors, who collaborated to create designs as part of the resettlement plan. Their expertise was crucial in ensuring that the housing solutions met the necessary standards and addressed the needs of the community.

Each professional contributed their expertise to ensure the design met the client's requirements. Land surveyors took the initiative to select a relocation zone based on agreed criteria, focusing on land availability and minimizing risks for new residents. Town planners were responsible for preparing the master plan, while structural engineers oversaw the structural implications of the design. Quantity surveyors managed project costs and prepared the Bills of Quantities. The appointed architect applied their knowledge to develop the overall architectural concept for the housing at Msomera, addressing aspects such as building location, layout and orientation, housing organization, architectural style and forms, as well as materials and construction techniques.

The government's goal was to offer the relocated community affordable housing to help them maintain their livelihoods. In this context, designing low-cost housing was considered essential. The objective was to create residential units that could house a specific number of relocatees, along with the necessary social services. It was pointed out by the architect that:

“I have given a task to design a low-cost residential house at Msomera village to fulfill the following requirements: Three-bedroom house, sitting room and external toilet and bathroom. The cost should focus on building form and materials specification including their availability at relocation site”.

The contractor for the project was SUMAJKT Construction Company Limited (SUMAJKT CCL), a public limited company affiliated with the Tanzania Peoples Defense Force. The National Service Corporation Sole (SUMAJKT) serves as the economic arm of the Tanzania National Service, engaging in a variety of commercial and productive activities.

The relocatee was responsible for accepting the completed house design that meets the requirements established by the government. This includes three-bedroom house, sitting room and external toilet and bathroom. One of the head of household argued that:

“Upon our arrival in Msomera with my family, we discovered that the stunning modern Houses we were promised had already been constructed. We were shown the house and start living. They are houses that exceeded our expectations”. However, given that I have three wives, ten children, and livestock, I need to construct additional houses and build a livestock enclosure”.

4.4.1 Overview of Maasai relocation process from Ngorongoro to Msomera

The project manager provided an overview of the relocation process, highlighting the key stages involved. The voluntary relocation of the Maasai from Ngorongoro to Msomera commenced in 2022. The plan aims to relocate 20,000 households, 115,000 individuals, and 819,460 livestock.

Stage One: Registration of Individuals and evaluation of property.

The initial stage involved the registration of individuals. This process includes the head of household along with their dependents, which may consist of wives, children, or other relatives as designated by the head. Furthermore, the evaluation of property housing was crucial to assess the living conditions and resources of the families involved. This exercise is conducted by officers from the NCA, land valuers from the Ministry of Land, and officials appointed from relevant institutions, ensuring a comprehensive understanding of the housing situation in Ngorongoro.

Stage two: Declaration of Household Information and Payment Schedules

In the second stage, the declaration and signing of payment schedules for the relocatees take place at the NCA. This process is essential for formalizing the financial arrangements related to the relocation. During this stage, relocatees review and sign the payment schedules, which outline the compensation and support they received throughout the relocation process. This step ensures transparency and clarity regarding the financial aspects of their move, helping to facilitate a smooth transition for all involved. The head of each household declares a list of names, which includes the household name, the number of wives and children, as well as details about their livestock helpers, including age, roles, and locations. This information provides an overview of the number of households that have agreed to relocate voluntarily. Additionally, the head of household reports the total number of livestock they possess, including cows, goats, sheep, and donkeys, to the livestock officers.

Stage three: Preparation of requirements and transportation to Msomera and other areas

This process involves the transportation of individuals, livestock, and other essential properties as approved by management. Transportation is facilitated through specially hired vehicles and is carried out in phases. Once the individuals arrive at their designated areas, a verification of their properties is conducted. Additionally, there are temporary camps set up in Msomera for relocated individuals to stay in before they move into their new residential houses.

Stage four: Handover of houses and other areas of ownership in Msomera

At this stage, each head of household is presented with and assigned their rights as outlined in the valuation book. These rights include receiving a modern, fully completed house, 2.5 hectares of land for housing and personal use for each family, five hectares designated for agricultural purposes, and a ten million incentive. Furthermore, the community was encouraged to make use of the incentives and financial compensation provided to them for their intended purpose, which is to enhance their housing, including the addition of more houses based on their family size. The NCA Authority has issued guidance to the community members who voluntarily decide to relocate as follows:

As the authority of the Ngorongoro Conservation Area, we believe that those who were displaced upon arriving in Msomera or other designated relocation areas should effectively utilize the compensation and financial incentives provided by the government for their intended purposes. Each household is encouraged to use the compensation received for their demolished houses in Ngorongoro to construct an additional home, separate from the house they have been allocated. Use this compensation fund to construct additional houses based on the size of your family. Additionally, it is important to preserve and retain the land for your family's future use.

4.5 Integration of Traditional Maasai Traditional Architectural values in future housing projects in Tanzania

The Maasai resettlement project in Msomera-Tanga presents a unique opportunity to leverage traditional Maasai cultural values in a manner that fosters both cultural preservation and adaptation to new environments. These values aim to promote Maasai communal living, reflect cultural identity, and demonstrate sustainable adaptation to their environment. This project has raised concern on disruption of Maasai cultural values. Despite the challenges observed, this study identifies ways to positively incorporate Maasai cultural values into architecture at Msomera, offering potential solutions for future Maasai relocation projects in Tanzania.

To identify way to ways on how to integrate Traditional Maasai Traditional Architectural values in future housing projects in Tanzania, the study adopted a qualitative research approach incorporating in-depth interviews, field and participatory observations, focus group discussions (FGDs), and literature review.

Therefore, the overall architecture of housing and the built environment should reflect and enhance Maasai cultural identity in the following ways:

4.5.1 Integration of hearth “Orupie” sustainable practice.

The traditional use of the hearth can be integrated with modern sustainable practices.

a) The use biogas

Integrating biogas is an ideal solution for the future relocation project for the Maasai, as it leverages organic waste, reduces dependence on firewood, and offers a sustainable energy source for cooking and heating. Given the Maasai's pastoral lifestyle, maintaining biogas systems will be easy due to the availability of animal manure, which is also an effective feedstock for biogas production. Moreover, this practice will be enhanced by adopting zero grazing, where livestock are kept in confined areas near their homes.

b) The use of improved cook stove (ICS) inside the building

Future relocation projects may incorporate the use of Improved Cook Stoves (ICS) in their design. ICS enhance cooking efficiency and significantly reduce indoor air pollution. Additionally, the design may feature a well-designed chimney to effectively vent smoke and pollutants outdoors. This approach will help maintain indoor air quality while still allowing for the traditional use of the hearth.

c) Creating designated outdoor cooking areas

An outdoor cooking area can be established to help reduce indoor pollution while enabling the Maasai to preserve their cooking traditions. This approach promotes both health and environmental sustainability. While a few have adopted this practice in Msomera, there is still a need for improvement to ensure it is implemented sustainably.

4.5.2 Maasai housing spatial requirements

Spatial design should accommodate the following aspects: supporting the pastoral lifestyle, facilitating ritual functions, and accommodating polygamy.

4.5.3 Homestead organization to enhance cultural identity

The Maasai should be organized in a pattern that enhance their cultural identity. It should be designed to enhance security against carnivores and livestock raids as well as to enhance privacy.

4.5.4 Orientation of Maasai homestead “boma”

Homestead orientation including the main entrance must follow the cultural axis "Kopkop," In this case, the main entrance of homestead should not align with the directions of sunrise and sunset. The designers should prepare design using participatory approach and implementing them on site accordingly. The cultural significance of this cultural axis is linked to blessings for their cattle, children, and overall prosperity.

4.5.5 The design of building form and shape that reflect Maasai identity

The Maasai housing style and forms are not only practical structures but also have symbolic meaning. The form and shape of Maasai housing are deeply intertwined with their cultural identity and lifestyle. Houses at Msomera lack this symbolic meaning. The Maasai houses are normally in circular or loaf-shaped. This research suggests the design of circular houses which are dominating at Ngorongoro and other parts of Maasai settlement.

4.5.6 Maasai Adaptation to new environment should involve a participatory approach

To ensure the effectiveness of this project, the adaptation spaces to new environment should be participatory within the community. Key values, such as incorporating livestock enclosures as a focal point in the design, must be taken into consideration. This may be done through their local leaders. The community, especially women, should be actively involved in the design and construction processes to address their specific needs, helping to balance the patriarchal structure within the community

4.5.7 The use of materials and construction techniques

The Maasai's focus on traditional materials such as sticks, mud, and cow dung highlight their cultural identity and commitment to living harmoniously with nature, fostering a deep emotional connection within the community. While sustainable practices may favor modern durable materials, these should be finished to reflect local materials in flooring, walls, Doors,

windows and roofing, with local sticks and timber used to maintain the aesthetic appeal of Maasai culture.

4.5.8 Implementing effective glazing land management

a) Adjusting stock rate to align with glazing capacity and spaces for their enclosures.

The Maasai community may be encouraged to reduce their number of livestock to better align with their glazing capacity and the available livestock enclosure spaces within their residential areas.

b) The use of zero grazing.

Another method is the use of zero grazing, which allows livestock to be kept in enclosures or confined spaces instead of grazing freely. It is a challenge that this method must go parallel with adjusting the number of livestock first. This approach can effectively manage land while preserving Maasai cultural identity if designed thoughtfully.

c) The use of rotational grazing.

Although the Maasai possess indigenous knowledge of livestock grazing, the leading authority may encourage them to adopt rotational grazing. This practice, which involves moving livestock between designated paddocks, enhances the health of soil, plants, and animals by allowing certain areas to rest and recover while others are grazed.

4.5.9 Conservation of Medicinal Plants at relocated zones

There is a need to include traditional knowledge in planning their community spaces, showing how important it is to keep these cultural practices alive, even in their new areas. This is crucial for maintaining biodiversity and supporting Maasai indigenous communities' health and economic needs.

CHAPTER FIVE

5. Discussion of Findings

5.1 Introduction

This section plays a critical part where findings are interpreted in the context of the study's objectives and the existing body of knowledge. This section goes beyond merely presenting the data; it involves analyzing and explaining the implications of the results, comparing them with previous studies, and addressing any discrepancies. It also discusses the significance of findings, potential limitations of the study, and suggestions for future research.

5.2 Traditional Architectural values of Maasai Housing

The findings in this section indicate that the Maasai Tribe possesses distinctive traditional cultural values that are intricately linked to their cultural beliefs. The design of traditional Maasai homesteads is influenced by a range of elements, including environmental conditions, folklore (encompassing cultural beliefs, proverbs, and narratives), their semi-nomadic way of life, social relationships, cultural traditions, rituals, and symbolic meanings. These findings align with the National Human Settlements Development Policy (URT, 2000), which emphasize for settlements that matches with the culture and living habits of the people.

5.3 Influence of Traditional Maasai Cultural values on Housing Architecture

5.3.1 *Th use of hearth “orupie”*

The study established that the hearth “orupie” holds a significant role in Maasai culture as it provides warmth, facilitate cooking, gathering place for family members, thereby enhancing social interaction and community cohesion. In certain communities, people express dissatisfaction with the absence of a hearth due to its cultural significance. (Shrestha et al. 2023). The houses in Msomera were designed without an indoor hearth to prevent air pollution that can lead to respiratory diseases. Consequently, many households began constructing separate outdoor kitchens; however, the small plot sizes often created challenges. This highlights a notable disconnect between housing design and the actual needs and lifestyle of the Maasai community. It is possible that houses at Msomera may be designed to accommodate a hearth in a sustainable way.

5.3.2 Privacy in Maasai

This study found that privacy is the most significant aspect in Maasai housing. This is due to the respect of their cultural values and maintaining their cultural identity. Maasai homestead provides spaces to conduct their ritual functions indoor and outdoor. Important rituals known as “ndaasa” are also carried out inside Maasai houses. Example, healing area for circumcised girls or as an altar for blessings. There are important rituals which are conducted outdoor normally within the cattle knaal such as conducting rites of passage: Boys circumcision, blessing and other rites of passage. The design at Msomera lack this aspect of privacy for Maasai to perform their ritual functions. Adaptation of their living spaces is evident to address their issue.

5.3.3 Maasai practice on polygamy structure

In Ngorongoro, the arrangement of separate housing for each wife and her children reflects the importance of privacy and individual family units within the polygamous structure. This architectural choice not only accommodates the familial dynamics but also reinforces the social roles and responsibilities of each wife. However, the relocation to Msomera, where families are placed in single three-bedroom houses regardless of the number of wives, disrupts the established architectural norm.

The Maasai's response to this challenge is evident in their attempts to adapt their living spaces by constructing additional small huts to regain a semblance of privacy and comfort. There are also individuals who have chosen to establish new homestead further away from Msomera to meet their pastoral needs. This adaptation underscores the resilience of traditional values in shaping architectural solutions that honor the complexities of family life within a polygamous framework. One of the family heads, the father, expressed his feelings with deep emotion, stating that:

Given that I have three wives and a large number of livestock, I decided to establish two households: one in Msomera and another in Kilindi, Morogoro. In Msomera, I live with my first wife and a portion of our livestock, while I have moved my other two wives to Kilindi, where I built them affordable houses and brought some livestock. Kilindi offers a larger living space and ample grazing land. I make arrangements to visit my wives periodically.

The above reveals that, there is a significant possibility that the household in Msomera may shift to Kilindi due to the challenges of managing a polygamous family. The larger living space and ample grazing land in Kilindi could make it more practical for all wives and livestock to reside together, potentially leading to a consolidation of households.

5.3.4 Maasai perception on the use of Toilets

Maasai communities have strong negative perceptions and attitudes towards latrines, viewing them as taboo and unpleasant, coupled with ignorance regarding the importance of proper sanitation, which contributes to low latrine usage (Thitu and Augustine 2016). In the context of Maasai relocation from Ngorongoro to Msomera, it was observed that Maasai place less importance on toilet use, influenced by their traditional living environment and the time spent herding livestock. The context of Maasai Men feels embarrassed to be seen by children or women while using the toilet, leading children to think their fathers do not use them. The practice of building toilets or latrines away from home and outside the fence highlights their need for privacy. Although toilets have been provided at Msomera, they require design modifications to ensure privacy, reflecting Maasai cultural values and promoting sustainability.

5.3.5 Livestock enclosure as a focal point of design

It is acknowledged that, the livestock enclosure dictates the organization Maasai homestead. It holds sacred significance as the site for cultural practices such as ritual for prayers, blessings, and celebrations. As observed, its entrance, "kishomi o nkishu," is crucial for cultural practices, especially rites of passage like boys' circumcision, highlighting the kraal's significance as a central hub of Maasai cultural identity and community life. There are significant challenges at Msomera associated with provision of livestock enclosure due to insufficient space, poor adaptation which interfere security of livestock. Permanent cattle kraals are established at communal land for reserve pasture "ronjo". There is a possibility of permanent living spaces at these areas. One of the respondents represented the idea of the community by arguing that:

After being relocated to Msomera, we were given a complete house. Each of us began to envision a location and method for building a cattle kraal, following the Maasai tradition. We typically construct a livestock enclosure first, with other houses coming afterward. Alternatively, if we start with a house, we already have a plan for where to place the enclosure. The challenge we face is aligning our homestead with the layout of the house we found on the plot.

5.3.6 The significance of courtyard

For Maasai, the courtyard is an essential gathering place in the homestead for family and community, encouraging social interactions, rituals, and events. Housing at Msomera lack this however few designs attempted to adopt by increasing their spaces. The face challenges due to the approach used for housing provision.

5.3.7 Security

Maasai housing layout is designed and organized to enhance security. Layout of three layers in concentric form and provision of fence around the perimeter of houses is evidence. Maasai community at Msomera were given permission to adopt their living spaces by building extra houses and other structures for the purpose of improving their houses. However, this adaptation poses challenges. Cattle knaal is observed to positioned very close to the road which interfere security of their livestock.

5.3.8 Orientation of Maasai homestead “boma”

The layout and orientation of Maasai homesteads, shaped by the cultural axis "Kopkop," determine the placement of the primary entrance “kishomi”, divide the homestead into sections established by the first and second wives, and connect various ritual elements, while generally not aligning with the directions of sunrise and sunset. The orientation of this cultural axis is linked to blessings for their cattle, children, and overall prosperity. Study by Ayubu and Cleempoel (2020), also highlighted the significance of this cultural axis in cultural perspective.

In Msomera, the designer’s idea in layout and orientation prioritized functionality and aesthetic considerations over the spiritual and cultural significance contained in the traditional orientation. This may lead to lose of cultural identity. Therefore, the orientation of Maasai bomas should prioritize the cultural axis "Kopkop" to preserve the spiritual and ritual significance that underpins their cultural identity, ensuring that functionality and aesthetics do not overshadow these essential values.

5.3.9 Maasai Housing style and form

The architecture of the Maasai houses normally reflects a deep-rooted connection to traditional cultural values. The Maasai housing style and forms at Ngorongoro are not only practical structures but also have symbolic meaning to enhance cultural identity. This fosters a sense of

attachment and ownership among people, rooted in emotional and cultural bonds to the place (Hashemnezhad, Heidari 2013).

The housing design at Msomera focused on providing affordable homes with an emphasis on simplicity and functionality. Contemporary housing in Msomera emphasizes modern materials and cost-effective designs for functionality and efficiency, but lacks the symbolic significance and cultural resonance of traditional Maasai structures, which reflect their pastoral lifestyle and community values. Integrating traditional Maasai housing styles in the relocation from Ngorongoro to Msomera is essential to preserve cultural values and emotional connections, ensuring that the community maintains its identity and sense of belonging in a new environment.

5.3.10 Use of local building materials

Traditional Maasai homes in Ngorongoro show their cultural identity by using local materials like sticks, mud, and cow dung. Their traditional values focus on living in harmony with nature, using local materials that blend with the environment. These materials create a strong emotional connection and sense of belonging for the community. In contrast, the modern houses at Msomera use materials like plastered block walls and corrugated steel roofs, which focus on being strong and practical but move away from traditional values. This change loses the cultural meaning that local materials hold, weakening the emotional ties that are important in Maasai architecture. Moreover, the colorful beadwork of the Maasai, which represents different parts of life and identity(Myung 2023), is not present in these modern buildings, indicating a cultural gap that comes with using new construction methods.

It is clear that the houses at Msomera are built for durability but do not reflect Maasai cultural identity. On the other hand, the homes in Ngorongoro have health issues like poor ventilation, and grass roofs require regular upkeep. A potential solution is to combine modern materials with traditional ones to improve durability while preserving Maasai cultural identity.

5.3.11 Maasai Patriarchal structure

The patriarchal structure of the Maasai significantly influences their architecture, particularly during the relocation from Ngorongoro to Msomera. It was observed that the decision to relocate to Msomera was taken by the head of the family(father). Since this was voluntary, this

made some head households to leave their wives and children at NCA which made them necessary to have two households both at NCA and Msomera.

Traditionally, Maasai men are the primary decision-makers regarding housing, but women are master designers and builders. But in this case men started to build new houses at Msomera.

The responsibility for adapting to this change, including building new houses to accommodate their families, fell primarily to the men, who took on the role of master builders instead of women. This led to the construction of homes that prioritize the needs and preferences of male as family leaders which potentially overlooking the input of women and children. These dynamics affect social interactions and community cohesion which are deeply rooted in Maasai culture. One of the household wives at NCA emphasized by saying:

My husband has chosen to leave me and the children to relocate to Msomera with his first wife. I am committed to staying in Ngorongoro and will search for a job to support my children here.

5.3.12 Maasai Adaptation to new environment

This study has acknowledged that Maasai have demonstrated a remarkable ability to adapt to changing circumstances, particularly in response to modern influences and environmental challenges. This architectural evolution demonstrates the Maasai's ability to blend their rich cultural heritage with practical adaptations to their surroundings, ensuring that their identity and social structures remain intact despite environmental changes.

Despite these developments, it was observed that the adaptation process brought significant challenges to the community, such as poor organization of their homesteads, which resulted in inadequate security and privacy. The shift toward contemporary housing designs and changes in cultivation practices are likely to impact their cultural identity. To ensure the effectiveness of this project, the adaptation of these spaces should involve a participatory approach within the community. Key values, such as incorporating livestock enclosures as a focal point in the design, must be taken into consideration.

5.3.13 Maasai coexistence with wildlife

The Maasai have historically coexisted harmoniously with wildlife, as evidenced by their customs and practices that include traditional rules for sustainable land management, reflecting a relationship that is deeply woven into their cultural identity rather than merely a survival necessity (Linuma et al. 2022).

The relocation of the Maasai from Ngorongoro to Msomera significantly influenced their traditional values and lifestyle. In Ngorongoro, their integration within the ecosystem shaped their architecture; however, this shift to Msomera led to changes in their architectural style. At Ngorongoro Conservation Area (NCA), houses were designed to enhance security against wild animals, while the housing design at Msomera lacks these security features. It has been observed that most houses in Msomera do not have fences, and those that do are built with normal materials. The coexistence with wildlife is integral to their cultural identity particularly in the NCA.

5.3.14 Spiritual connection to landscape

The Maasai's strong spiritual connection to their landscape, especially Mount Oldoinyo Lengai, affects their building styles in Msomera. The study by Ayubu and Cleempoel (2020), highlighted that the presence of shrines, performance of rituals and cultural practices in Ngorongoro makes inhabitants feel the “sense of place” through spiritual connection with their homesteads.

However, in areas like Msomera, where the spiritual connection to the landscape is weaker, the Maasai have faced challenges in maintaining these architectural traditions. It is clear that the absence of rituals and cultural practices have led to a sense of detachment from their surroundings, prompting changes in architectural styles that may stray from the spiritual meanings traditionally associated with Maasai structures.

Thus, the interplay between spiritual connection and traditional values is crucial in shaping Maasai architecture, highlighting the importance of these elements in preserving their cultural identity and community cohesion.

5.3.15 Ethnomedical sites

The difference in the quality and availability of herbal medicine between Ngorongoro and Msomera shows how important traditional healing sites are to Maasai culture and their buildings. In Ngorongoro, the many medicinal plants support traditional healing, and the architecture is built to help people access these resources, with places for community gatherings and sharing knowledge. In contrast, Msomera has fewer effective herbal medicines, which may lead to simpler buildings that don't reflect the Maasai culture as much. This change will result in fewer community spaces for traditional practices. The fact that people must travel to find better medicinal products highlights the need to include traditional knowledge in planning their

community spaces, showing how important it is to keep these cultural practices alive, even in new areas.

5.3.16 Maasai pastoralism life style

Maasai pastoralism significantly influences the architecture in Msomera by shaping the design and layout of their living spaces. As observed Maasai stay close with their livestock. Due to insufficient space, some households are unable to accommodate a large number of livestock within their homestead. As a result, they have built small enclosures for a few animals, such as sick animals, goats, and sheep. The remaining livestock are herded on communal grazing lands and designated reserve areas, but the traditional practice of herding cattle from morning to evening is diminishing. Poor adaptation of their living spaces has led to inadequate security and a disruption of Maasai cultural practices. Rituals associated with livestock enclosures, such as circumcision rites, dancing, blessings, and family gatherings, have also been affected.

5.3.17 How communal land alterations influenced Maasai Architecture

Changes in communal land ownership among the Maasai in the Ngorongoro Conservation Area and Msomera greatly affect their living spaces and building styles. In Ngorongoro, the traditional communal system includes areas like "Alalili" for young and weak animals during droughts, promoting shared resource management. In contrast, Msomera has more privatized land, where each household has its own plot, leading to isolated homes and less community interaction. The limited grazing areas in Msomera have led to the creation of temporary camps, or "ronjo," to better manage livestock, showing how land use changes require different building approaches. But situation where Maasai herding their livestock on glazing lands for a long time without turning back home indicating the possibility of establishment of permanent settlement in communal lands. This situation highlights the conflict between traditional Maasai values of communal living and modern land ownership pressures, which ultimately shape how the community builds and lives. The results also obtained from primary land cover classes which affected Maasai Architecture through their pastoral life style.

5.3.18 Limited Grazing Land

The new allocated area for grazing is significantly smaller than the expansive rangelands of Ngorongoro. A study by Baartman et al. (2007), showed that increasing numbers of livestock in conjunction with a decrease in the area of rangeland, resulting in overgrazing, a deterioration

of soils and a decrease in plant species suitable for grazing. This limitation restricts the Maasai's ability to practice rotational grazing, which is essential to prevent overgrazing and maintain soil health.



Figure 5-1: Msomela new allocated area for grazing (Source: Author 2024)

5.3.19 Risk of Overgrazing

With a fixed and limited space for grazing, the risk of overgrazing is high. That can contribute to soil degradation, loss of vegetation cover, and the transformation of the land into bare ground, which is more prone and less productive. Grazing lands are the most degraded land use type in the world, especially in arid and semiarid regions due to human activities such as overgrazing and drought (Vasilios P. Papanastasis 2009). Overgrazing refers to an excess of grazing animals that leads to the degradation of plant and soil resources, resulting in a loss of biological and/or economic resilience of the land (Baartman et al. 2007).

5.3.20 Water Scarcity

The artificial pond as indicated in Figure 4-37 provided in the new location during dry seasons is not sufficient to meet the needs of the Maasai's livestock. While there is presence of larger, natural water features. In Ngorongoro, ensured a long-lasting supply of water and more reliable

for the community and their animals as shown on how the amount of water from different water featured areas is maintained, which is different from Figure 5-5

The presence of artificial livestock water points indicates water scarcity in grazing land of Msomera. This was provided as the means of overcoming water shortage. A study by Elifuraha Laltaika, (2014) shows that water is one of the important natural resources that support pastoralism while others are seasonal pasturelands and salt lick. To mitigate this situation, the above measures should be implemented, but they need to be sustainable and cost effective.



Figure 5-2: Msomela artificial pond and water point (Source: Author 2024)

5.3.21 Climatic conditions and their impact on Maasai housing comfort and adaptation

The climatic differences between Ngorongoro and Msomera significantly influenced the research findings and outcomes. The cooler and wetter conditions of Ngorongoro supported the effectiveness of traditional Maasai housing, where locally available materials such as sticks, mud, cow dung, and thatch provided natural thermal regulation and comfort (Samuel et al., 2017). In contrast, the warmer and drier climate of Msomera exposed the limitations of modern houses constructed with industrial materials, which failed to adapt to local climatic conditions. As a result, relocated Maasai residents reported discomfort and responded by modifying their living spaces and constructing smaller traditional huts with hearths (“Orupie”) to improve warmth. These findings demonstrate that climate plays a vital role in determining housing

comfort and cultural adaptation, emphasizing the importance of integrating climatic responsiveness into the design of future resettlement housing.

These environmental features such as bare land, vegetation cover, and water availability are closely affected by climate variation and have significantly influenced the Maasai's adaptation, land use, and housing practices in Msomera. Lack of water and grasses for their livestock has become a major problem.

5.3.22. Expected consequences in future

The above findings reveal and expect the following consequences in future:

- Due to insufficient space in their residential plots, there is a possibility of moving to communal grazing land for better care of their livestock, as many livestock have been observed growing up in the grazing area without returning home.
- Given their lack of experience in agricultural practices, there is a possibility that the 2.5-hectare plot designated for cultivation will be converted into reserved pastures or developed into a new residential area to accommodate their families.
- Household leaders who left their wives in Ngorongoro and are hesitant to relocate may likely choose to follow them, resulting in the continuation of two separate families.
- There is a strong possibility that some Maasai households will relocate to areas outside of Msomela, as seen with one resident who divided his family and livestock, moving them to another region, Kilindi Morogoro.
- There is a significant possibility that the Maasai may reduce their livestock numbers and engage in business and agricultural activities, which could ultimately undermine their cultural identities.

Maasai cultural values influencing architectural form align with the National Housing Policy (URT, 2000) and the National Cultural Policy (1997), which emphasize culturally responsive housing and the preservation of local traditions to promote sustainability and tourism.

5.4 Design approaches of Modern Housing in Msomera.

For objective number three, the housing design approach and overview of the relocation process indicate that the design aspect of the relocation project from Ngorongoro to Msomera involved only the design team and the client. This highlights a significant gap, demonstrating that the design approach lacks a participatory element in this phase of housing provision. Despite the

Ngorongoro Conservation Area Authority (NCAA) adhering to all established procedures such as offering education on the voluntary relocation program initiated in June 2022, facilitating house construction, and providing Ten (10) million to each household there are still challenges to address.

In this scenario, the relocated community was expected to accept a finalized housing design. At this stage, users cannot contest the design concept or its overall architectural features. Goal 11 of the United Nations' Sustainable Development Goals aims to ensure that everyone has access to adequate, safe, and affordable housing by 2030 (Opoku 2016b). However, the notion of "adequacy" differs from one country to another, influenced by various cultural, social, environmental, and economic factors. The goal of the project at Msomera is to design low-cost housing that effectively accommodates the targeted number of individuals. Low-cost housing projects often provide substandard accommodation that neglects residents' lifestyles, which can intensify cultural, social, religious, and geopolitical tensions in vulnerable communities (Abbakyari et al. 2023).

5.4.1 The concept Participatory Design Approach

Participatory Design (PD) starts by addressing the values and concerns of specific groups, prioritizing the needs, wants, and desires of users as both individuals and a collective. At its essence, it views human beings as active participants rather than mere subjects of human factors (Ramírez Galleguillos et al. 2022). This approach involves users as informants or co-designers, rooted in the belief that they have a democratic right to influence the design of technologies that affect them. This approach leads to better products and systems, enhancing both user satisfaction and operational efficiency by fostering empowerment and value for users (Manatunge and Abeysinghe 2017).

5.4.2 Lack of participatory design at Msomera

The responsibility for selecting the relocation site, determining plot sizes, and overseeing the overall architecture of Maasai housing in Msomera was delegated to technical personnel appointed by the Ministry of Natural Resources and Tourism. The Maasai tribe, a nomadic pastoralist ethnic group, is known for its distinctive architectural style and traditional values. Their housing features unique orientations, layouts, organizational patterns, spatial requirements, building forms, shapes, and the use of traditional materials.

The study clearly demonstrated a lack of beneficiary involvement or consultations during both the planning and implementation phases, which has become a major source of dissatisfaction among the respondents. Specifically, the absence of local beneficiary participation in the design process at Msomera has resulted in inadequate exterior and interior designs that do not consider the local natural environment, cultural context, and socio-economic diversity. This oversight has led to a variety of related issues.

The absence of a participatory design approach in the housing provision for the Maasai community at Msomera has resulted in cultural disconnection and social fragmentation. Without the active involvement of the Maasai in the design process, the housing solutions have failed to reflect their traditional values and lifestyles, leading to structures that feel alien and unwelcoming. This disconnect has consequently resulted in project dissatisfaction and poor social cohesion, jeopardizing the community's well-being and sense of belonging.

Numerous previous studies on resettlement housing offer substantial evidence highlighting the inappropriate designs that arise from a lack of attention to cultural needs and local conditions (Manatunge and Abeysinghe 2017; Peng et al. 2020; Shrestha et al. 2023). The emphasis on technical standards by implementing agencies often overshadows essential social and cultural needs (Shrestha et al. 2023). The pressure to deliver rapid results often compromises construction quality and restricts opportunities for community consultation processes. Planners often neglect beneficiary participation in expedited reconstruction programs, viewing lengthy consultations as unnecessary. This leads to houses that fail to align with the beneficiaries' expectations, needs, and cultural context. (Manatunge and Abeysinghe 2017).

It is acknowledged that the active community engagement during the planning and design stages is vital, as it identifies specific socio-cultural needs, fosters ownership, and cultivates positive perceptions of new homes and settlements. This underscores the importance of involving community members as partners in every aspect of the relocation process (Shrestha et al. 2023). Valuing Indigenous knowledge is crucial for incorporating their views and needs into the project, enabling the identification of culturally and contextually appropriate solutions (Gitonga et al. 2001).

In my opinion, the housing provision approach at Msomera has neglected significant cultural needs, primarily because the design process lacks a participatory element in its technical aspects. The housing policies and programs have not successfully achieved their intended goals

regarding the socio-cultural aspects of sustainability. Typically, public sector policies approach housing as a discrete project rather than a comprehensive system. Consequently, there is a strong focus on fulfilling project objectives, particularly in terms of the number of housing units delivered. Unfortunately, this approach often overlooks the socio-cultural aspirations of the beneficiaries.

This issue lies at the heart of the ongoing debate and controversy surrounding the relocation process of the Ngorongoro community to Msomera. A major concern for those being relocated is the potential disruption of their traditional practices, which threatens to erode their cultural identity. Implementing a participatory design approach could effectively address these cultural needs, leading to sustainable housing solutions that are essential for both the livelihood of the relocated individuals and the preservation of their cultural heritage. The limited community involvement in housing design contrasts with the participatory planning principles outlined in the National Land Policy (URT, 2021).

5.5 Integration of Traditional Maasai Traditional Architectural values in future housing projects in Tanzania

In the relocation program at Msomera, integrating modern building technologies with Maasai cultural elements is essential to achieve housing that is both sustainable and culturally responsive. Modern construction methods can be harmonized with traditional Maasai spatial layouts, materials, and decorative finishes. This integration ensures that the relocated community benefits from improved comfort and durability while preserving their cultural identity, forming a foundation for future housing designs across Tanzania.

5.5.1 Integrating a traditional Hearth in a sustainable way

This study suggested the use biogas, improved cook stove (ICS) and creating designated outdoor cooking areas. These clean cooking solutions enhance cooking efficiency and significantly reduce indoor air pollution. Integrating the traditional hearth "Orupie" into sustainable practices is culturally significant for the Maasai, as it symbolizes warmth and community bonding while preserving traditional cooking methods and promoting eco-friendly energy use in line with their values of sustainability and respect for nature.

i. The use biogas

This study has identified the use of biogas as a solution source of energy for sustainability of housing at Msomera. This sustainable energy solution is expected to foster community bonding as families gather around the hearth, and when well-positioned, it facilitates social interaction among neighbours. It supports the Maasai's pastoral lifestyle by effectively managing waste and reducing reliance on firewood, thereby promoting a more sustainable and harmonious relationship with their environment.

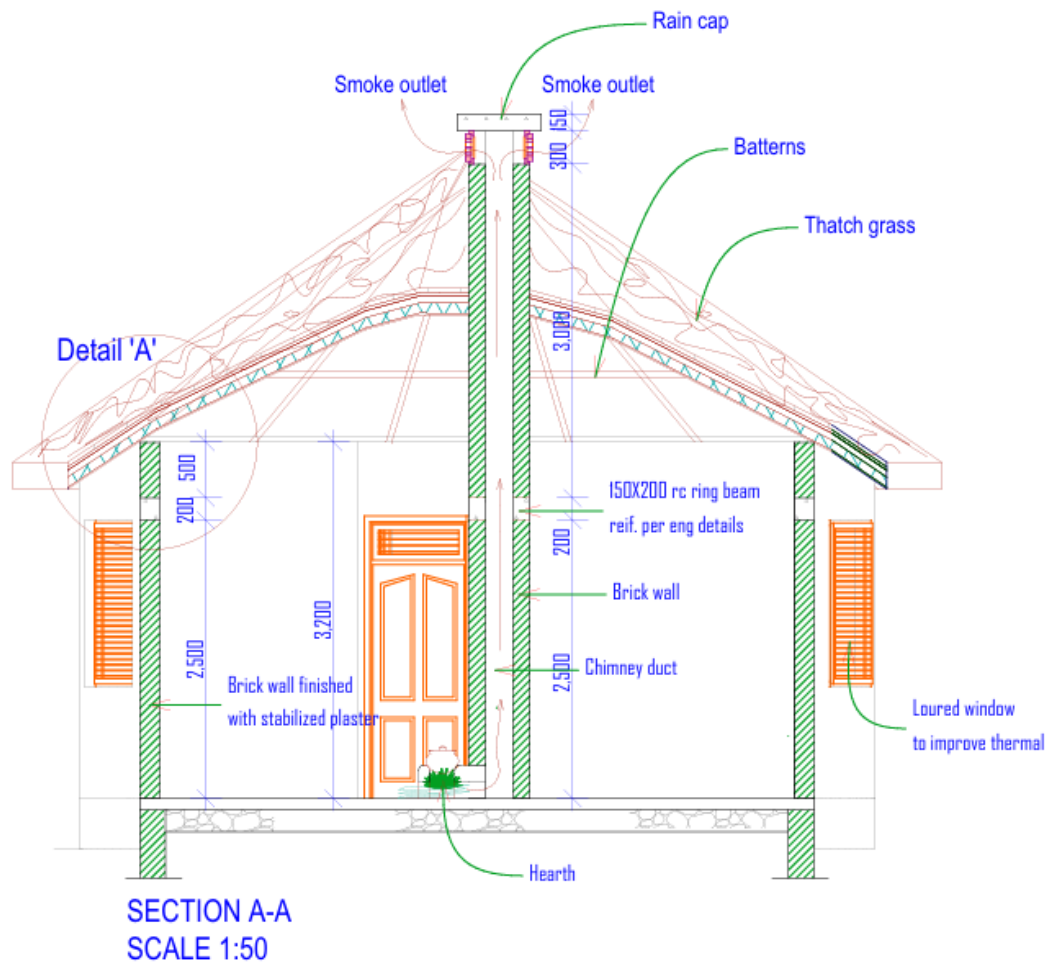
This aligns with other studies that indicate integrating biogas systems in rural communities enhances cultural and environmental values by reducing air pollution and greenhouse gas emissions while improving human health by minimizing smoke from burning wet wood (Carlos 2013; Omari, Sarakikya, and Tesha 2020).

ii. The use of Improved cooked stoves (ICS)

The distribution of cooking stoves effectively reduces firewood use and greenhouse gas emissions, promoting clean, affordable, and modern energy sources (Vegezzi 2021). This aligned with the AWF project targeting the Maasai communities in the three villages of Olbili, Lemasusu, and Oltiasika in Mbirikani, Kenya. The project aimed to raise awareness and build capacity in the local community on the benefits and installation of improved cook stoves and solar lighting technology. The report revealed that the use of improved cook stoves (ICS) in Maasai communities in Mbirikani, Kenya, was positively influenced their homes. The project involved training women as master builders, who expressed satisfaction with this alternative energy source facilitated by expert training on sustainable installation and usage (African Wildlife Foundation 2014).



5-3: Improved Traditional Maasai Hearth (Source: Author 2024)



5-4: Details for improved Maasai hearth

iii. The use outdoor kitchen

In other situations, the use of fire wood may not be avoided in local communities. In case the relocation programmes fail to integrate the other methods, the outdoor kitchen may be used. The same outdoor kitchen may also be used in a sustainable way and at the same time enhancing their cultural identity.

This aligns with the study by Shrestha et al. (2023), which highlights that traditional hearths are essential for cultural and religious rituals in relocated indigenous communities. If relocation programs do not incorporate these hearths, households may adapt by building separate outdoor kitchens to reduce indoor firewood use.

5.5.2 To adhere with the spatial qualities of Maasai homestead

The qualities and significance of Maasai homestead spaces include their capacity to accommodate polygamous families, with each wife residing in separate units, allowing the husband to rotate his attention among them for marital matters. Furthermore, the design of these spaces facilitates both indoor and outdoor ritual functions, prioritizing privacy. Key elements such as livestock enclosures, courtyards, backyards "kioni", and multiple housing units arranged in a cultural pattern are integral to the overall layout, reflecting the Maasai's social structure and cultural practices.

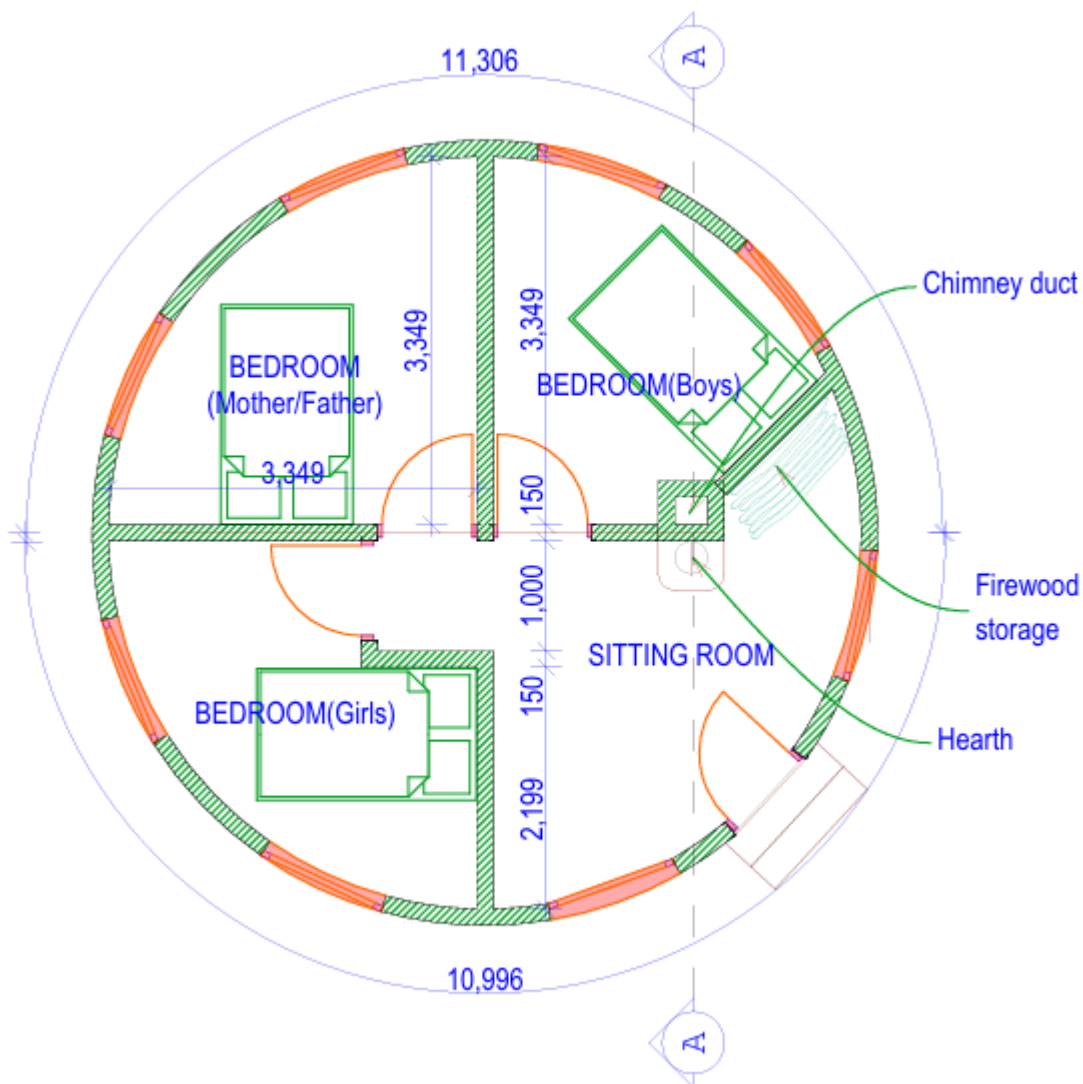


Figure 5-5:Maasai main house housing layout (Source: Author 2024)

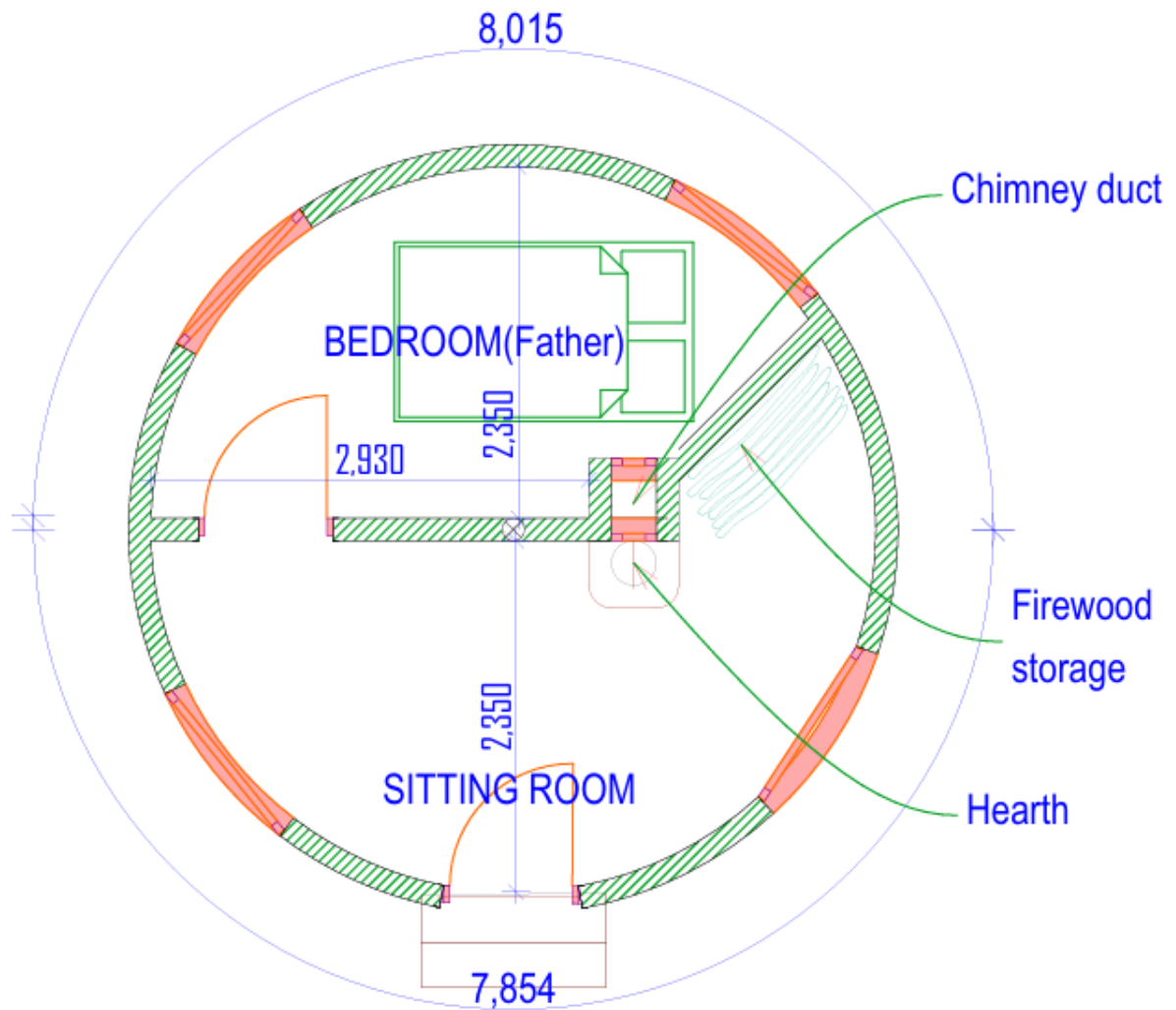


Figure 5-6: Father's house (Author 2024)

It is evident that insufficient space has impacted the architecture of Maasai at Msomera by forcing adaptations that compromised traditional designs and cultural practices. Limited space has led to impact on communal areas and residential spaces making it challenging to maintain the privacy and separation essential for polygamous families. Furthermore, the need to accommodate various functions such as rituals and livestock management within a constrained area can result in a less effective layout that does not fully support the Maasai way of life. This situation may also lead to conflicts over space usage and diminish the overall quality of living conditions, ultimately affecting the community's social dynamics and cultural identity. The study by Albert et al 2020, Ayubu and Cleempoel (2020), explained on the significance, requirement and qualities of Maasai spaces.

Adhering to the spatial qualities of Maasai homesteads at Msomera is crucial for preserving cultural identity, enhancing communal harmony, and ensuring the effective functionality of living spaces that support the unique social dynamics of polygamous families.

5.5.3 Homestead organization to enhance cultural identity

To enhance the cultural identity at Msomera houses should be organized in a cultural pattern. The organization of housing in a concentric pattern is significance to enhance security to protect them from carnivores. The cattle knaal is the most sacred place for Maasai as it is the place associated with ritual functions such as circumcision rites, gathering place for community dancing.

It is clear that Maasai at Msomera were provided with a main house with external toilet so that they can adapt themselves on increasing their spaces by constructing new houses and other structures. It was noted that the way they are adapting their spaces were influenced by the previous design and insufficient space which make their housing organization being disconnected from their pastoral life style. This study is proposing the housing organization as illustrated bellow.



Figure 5-7:Proposed Homestead organization for future resettlement projects (Author 2024)



Figure 5-8: Proposed Homestead organization for future resettlement projects (Source:Author 20204)

The study by Shrestha et al. (2023) highlighted that resettled households faced significant issues due to discrepancies between the housing layout and their local lifestyle and culture. Furthermore, Ayubu and Cleempoel (2020), highlighted that Maasai housing organization is influenced by their culture. The cattle kraal, is considered the most sacred space among the Maasai and central to their homestead design, influences the organization and dimensions of livestock enclosures based on indigenous construction principles.

The highlight pointed out by authors is evidence considering the significance of Maasai housing organization to align with their pastoral lifestyle in a pattern that enhance their cultural identity.

5.5.4 Orienting homestead “boma” according to Maasai tradition

The orientation of homesteads is significant in Maasai architecture, particularly through the cultural axis known as "Kopkop," which is linked to blessings for cattle, children, and community prosperity. This axis dictates that the Boma should not align with the directions of sunrise and sunset and is relevant in various rituals, including blessings for traditional leaders. The cultural order positions the first wife on the right side ("entaloishu o tatene"), the second

wife on the left ("entaloishu o kedyange"), and other wives accordingly, highlighting the importance of this axis in their societal structure.

Following the cultural order in housing orientation is crucial for the project at Msomera. Misuse of these values can lead the Maasai to perceive a disruption of their cultural identity, making it difficult for them to adopt these practices due to the existing housing designs they encountered. The significance of homestead orientation was also discussed by other researchers in the context of Ngorongoro. The significance of Maasai homestead orientation, as emphasized by the cultural axis "Kopkop" and supported by studies like Ayubu and Cleempoel (2020), underscores its essential role in preserving cultural identity and societal structure, especially in projects like Msomera

5.5.5 The design of building form and shape that reflect Maasai identity

The field study identified that Maasai houses are normally in circular or loaf-shaped though round house is dominating in Maasai built environment. The round shape is easy to construct and sustain easily the weather condition such that the roof drain water easily. The forms of these houses are not only practical structures but also have symbolic meaning. The form of Maasai housings is deeply intertwined with their cultural identity and lifestyle. These homesteads symbolize Maasai's connection to their pastoral lifestyle. The circular shape of the Manyatta symbolizes unity and community, reflecting Maasai values of togetherness and cooperation while reinforcing social bonds among family members and the broader community.

The housing design in Msomera was found to lack the symbolic significance associated with the Maasai as a pastoral community. The houses bear no distinction from those of other tribes in Tanzania, and their overall form does not represent the Maasai's cultural identity. As a result, this disconnect may lead to a sense of alienation among the residents regarding their homes. This study is proposing the form and shape of buildings to be as illustrated below:



Figure 5-9: Proposed form and shape of Maasai housing (Source: Author 2025)

Incorporation of Modern Architectural Concepts in House Design

Modern architectural concepts can be incorporated into the design by improving functionality, natural lighting, and ventilation while preserving the symbolic circular and enclosed forms characteristic of Maasai housing. This approach ensures that cultural identity is maintained while meeting contemporary housing standards.

This aligns with the study by Hashemnezhad and Heidari (2013), arguing that housing form play important significance as it fosters a sense of attachment and ownership among people, rooted in emotional and cultural bonds to the place. Furthermore, a study by Ayubu and Cleempoel (2020) noted that Maasai housing has symbolic meaning, with its physical qualities influenced by indigenous design principles derived from the environment, cultural beliefs, social ties, and folklore. Preserving the traditional Maasai building form is crucial for maintaining their cultural identity and fostering community connections, as supported by various researchers.

5.5.6 Maasai Adaptation to new environment should be participatory

Adaptation encompasses the actions taken by individuals, households, communities, and organizations, both private and public. Effective adaptation enhances resilience by improving existing coping mechanisms and strategies, thereby reducing vulnerability to climate impacts (Bobadoye et al. 2016). Adaptive capacity relies on the range of environmental, social, economic, and political entitlements that specific individuals, households, or communities can mobilize to manage risk (Goldman and Riosmena 2013).

This study demonstrated that the Maasai have adaptive characteristics essential for maintaining a balanced and harmonious relationship with their environment. However, their adaptation to the new area of Msomera has resulted in challenges, including poor security and disorganized housing, largely due to insufficient community participation in the housing design process. Furthermore, the understanding of adaptation varies within the community, influenced by demographic factors. Notably, elders, spiritual leaders, and women possess significant knowledge of cultural values that are crucial for constructing their homesteads.

However modern technologies and innovations can be integrated into Maasai housing by installing solar panels for sustainable energy supply and improving water infrastructure, including ponds and water points in both residential areas and grazing lands, to alleviate water shortages and enhance community resilience.

5.5.7 The use of local building materials to reflect their cultural identity

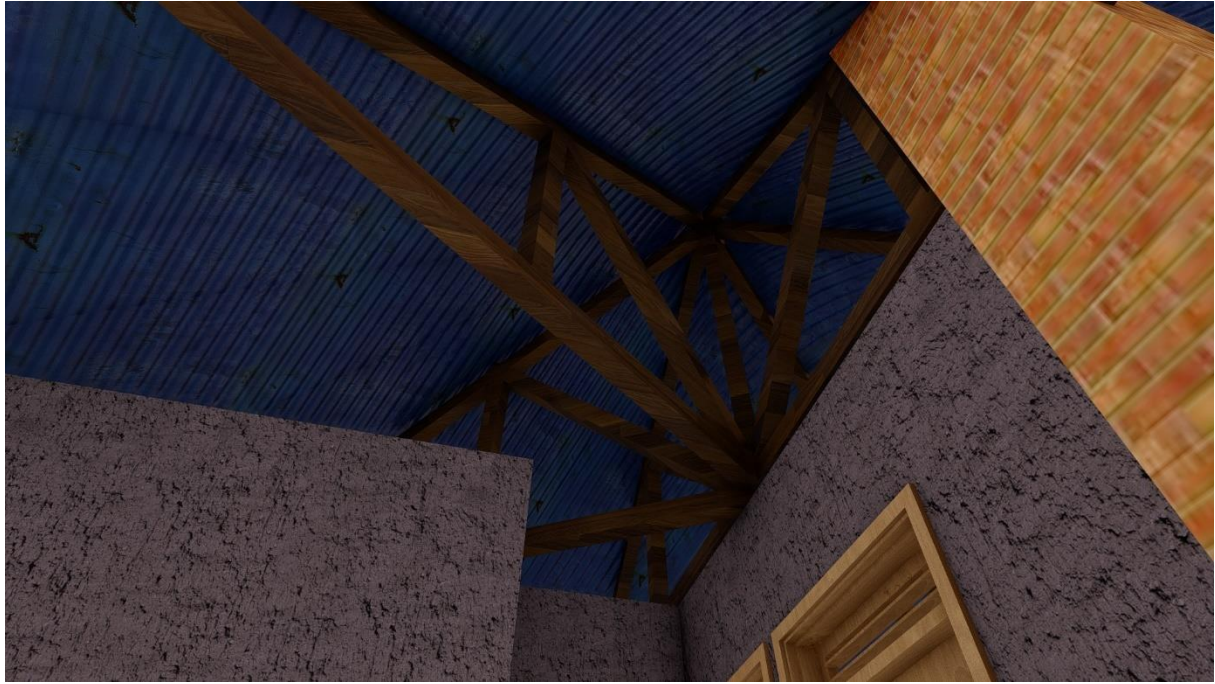
A Maasai homestead should be built using local materials that reflect their culture and traditions. This study does not recommend traditional construction methods with sticks, mud, and cow dung due to durability concerns. Instead, these materials can be incorporated into modern designs to promote cultural identity. Contemporary homes can utilize modern materials while featuring unique finishes and colors that align with Maasai heritage, ensuring that the floors, walls, and roofs reflect their pastoral lifestyle. Various colors found in Maasai clothing and bead work may be utilized for internal and external wall finishes as they possess the great significance and meaning.



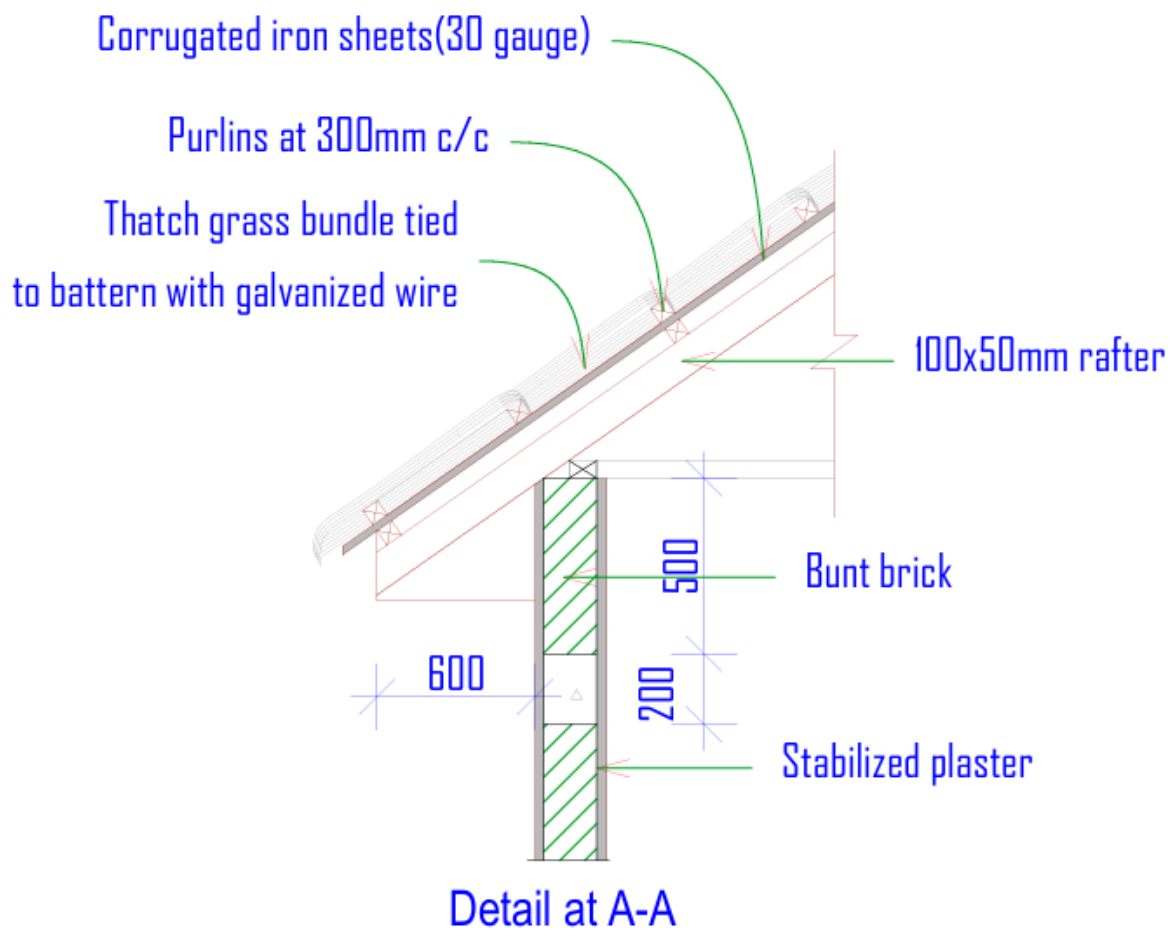
5-10: External wall finishing materials (Source: Author 2024)



5-11: Internal Wall and floor finishing materials (Author 2024)



5-12:Proposed Roofing materials at Msomera (Author, 2024)



5-13:Roofing materials and construction Techniques (Author 2024)

Local Material Sourcing Strategies in Msomera

In Msomera, the use of locally available building materials is both practical and sustainable. The area has access to several natural and locally produced materials that can support housing construction. Key materials include earth (soil for adobe or stabilized blocks), timber, grasses, stones, and burnt bricks. Industrial materials such as cement, corrugated iron sheets, nails, and reinforcement bars can be easily sourced or processed in nearby Handeni, where small-scale industries and supply centers support construction activities. It is advisable to use the same or equivalent local materials. This integration of both local and industrial materials helps to minimize environmental impact, lowering construction costs, and promoting community participation in housing development.

Harmonizing Traditional Materials with Modern Building Standards

In Tanzania, there are no clear government policies or regulations mandating the application of green building practices in building development, and the country relies instead on adopted foreign building standards and certification systems (Nkini et al., 2024; Kibert, 2024). However, the use of these stabilized materials is hindered by barriers of cost, the lack of awareness and knowledge regarding these materials, Technical and performance uncertainties, supply chain limitations complicate and Regulatory and policy barriers also play a pivotal role (Mahame et al 2024).

Traditional materials such as earth, timber, and thatch can be harmonized with modern building standards through improved construction techniques, stabilization, and treatment to enhance durability, safety, and performance while retaining their cultural significance.

For the floor, the traditional compacted earth floor can be upgraded by adding a thin concrete screed or stabilized soil layer to prevent dust, moisture, and cracking. Finishes such as polished mud lime mix or cement coating can be applied to achieve a smooth, durable, and easy-to-clean surface while preserving the traditional earthy look.

For walling, traditional materials such as mud or adobe mixed with straw can be stabilized using lime or cement to improve strength, moisture resistance, and durability while maintaining the natural thermal comfort and cultural appearance of Maasai structures.

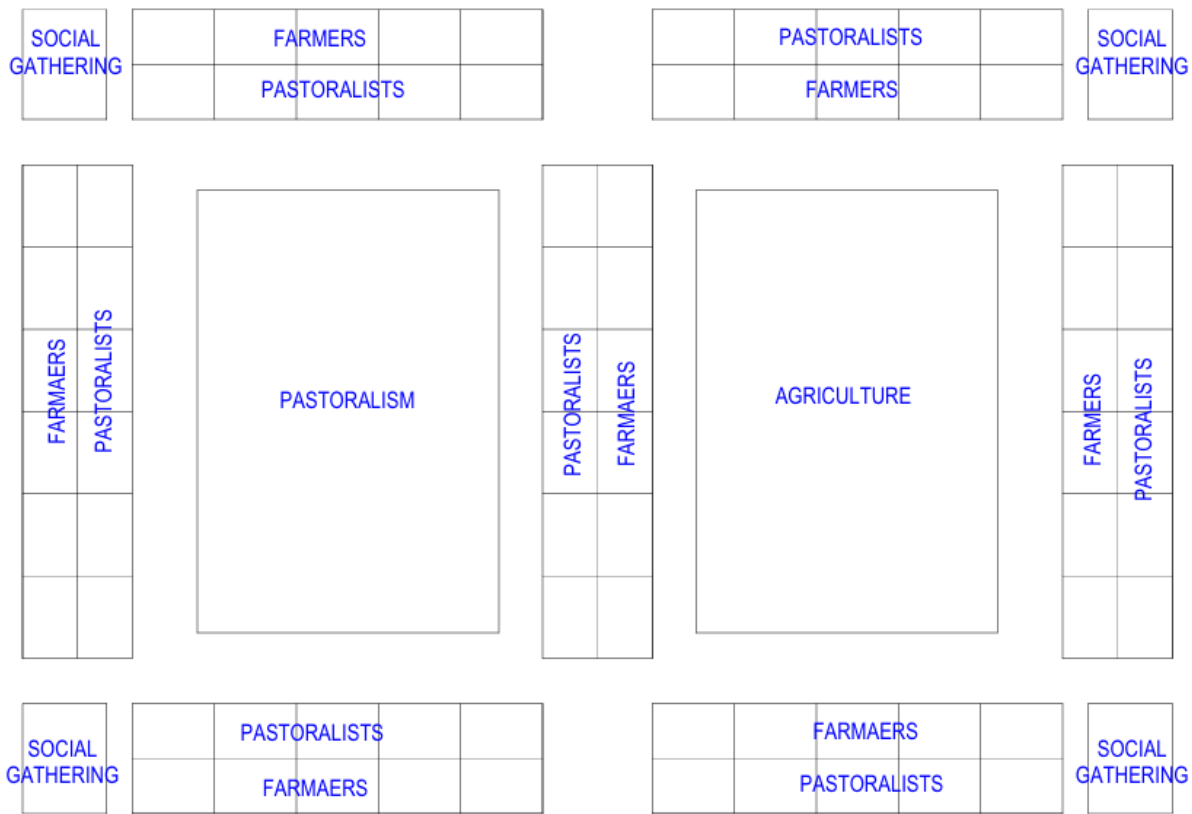
For roof construction, harmonization can be achieved by using thatch grass as the outer roofing layer to enhance thermal insulation and preserve cultural aesthetics, while corrugated iron

sheets are installed beneath to provide durability, structural strength, and weather resistance. This combination maintains the traditional Maasai appearance while meeting modern building standards for safety and performance.

Various studies highlighted the significance of local materials and colors in the design and function of Maasai homesteads and communal spaces, symbolizing their pastoral lifestyle and fostering a strong sense of belonging and identity within the community (Albert at 2020 and Myung 2023). This has proved the importance of integrating these colors in Maasai housing design.

5.5.8 Decentralized zoning based on user needs and land-use compatibility

The system of land use zoning should decentralize priority functions by users and compatibility. It minimizes grazing farming conflicts by creating compatible zones that promote coexistence, sustainable resource use, and equitable land access. The existing development in the study area of Msomera seemed to be a kind of mixed-use development.



5-14:Contextual zoning at Msomera (Source: Author 2024)

5.5.9 Implementing effective glazing land management

- iv. *Adjusting stock rate of livestock to align with glazing capacity and spaces for their enclosures.*

One of the major findings of this study is the insufficient grazing land in Msomera. The livestock relocated from Ngorongoro lack adequate space for accommodation. It is evident that relocating the Maasai to Msomera is not feasible, as the Ngorongoro area is significantly larger, allowing for greater freedom of movement and access to expansive common spaces for their livestock (Oleshangai 2022).

This challenge of insufficient space in residential plots and other common spaces necessitate this study to encourage the Maasai to reduce their number of livestock to better align with their glazing capacity and the available livestock enclosure spaces within their residential plots. This practice of adjusting livestock stock is most common applied for most pastoral indigenous communities as the way to rescue the situation in a sustainable way. In case of drought and insufficient glazing land people are encouraged to adjust herd size for sustainable livestock management (Nkedianye et al. 2019).

- v. *The use of zero glazing.*

Zero-grazing is a labor-intensive livestock production method where animals are fed at the homestead, necessitating the collection of fodder and water, tasks that are primarily carried out by women (Wangui 2008). It is a challenge that this method must go parallel with adjusting the number of livestock first. This approach can effectively manage land while preserving Maasai cultural identity if designed thoughtfully. At Msomera, these enclosures could be integrated into residential areas.

- vi. *The use of rotational glazing.*

While the Maasai have traditional knowledge of livestock grazing, the leading authority may promote the adoption of rotational grazing. Historically, the Maasai practiced rotational grazing by designating specific areas for wet-season grazing and others for dry-season grazing (Ayuka 2023). Due to insufficient space in glazing land and bare land which caused by practicing a large number of livestock, rotational glazing may be sustainable solution for effective land management.

5.5.10 Conservation of Medicinal Plants at relocated zones

Approximately 70–80% of the global population primarily depends on traditional herbal medicine for their healthcare needs. The conservation of medicinal plants is particularly important due to their significant cultural, livelihood, and economic roles in many communities (Hamilton 2004). In addition to water and pasture, the Maasai heavily depend on medicinal plants. This reliance has led them to develop a rich knowledge of their local environment over time. This involves conserving the right species to ensure their value and availability. Prioritizing certain medicinal plants benefits society by enhancing people's well-being and supporting the sustainability of ecosystem products and services (Nankaya et al. 2021). Through physical observation, interview and FGD, this study revealed that there was lack of medicinal plants at Msomera which necessitated the Maasai to go back at NCA finding for quality products. There is a need to conserve these plants at relocated zones of Msomera to conserve the biodiversity of the ecosystem, to preserve cultural heritage and traditional knowledge associated with their use, to sustain their livelihood through harvesting and trade them and ensure healthcare for their families and the entire community.

It is therefore ideal to integrate traditional Maasai cultural values in the Msomera-Tanga resettlement project is significant as it fosters community cohesion and enhances social identity while ensuring the preservation of cultural practices. Integrating traditional Maasai design principles into future resettlement projects would advance the policy goals of culturally compatible and sustainable housing (URT, 2000; URT, 2012).

5.5.11 . Expected consequences in future for ongoing relocation projects

The findings reveal several potential consequences of the Maasai relocation to Msomera. Due to insufficient residential space, the Maasai may move to communal grazing lands to better care for their livestock. Their lack of agricultural experience may lead them to convert the designated cultivation plots into reserved pastures or new residential areas. Some Maasai households may choose to remain in Ngorongoro, resulting in divided families. There is also a possibility that some Maasai may relocate to other regions, as seen with one resident who divided his family and livestock. Lastly, the Maasai may reduce their livestock numbers and engage in business and agricultural activities, which could potentially undermine their cultural identities.

5.5.12 Planning solutions to minimize conflicts between resettled communities and original inhabitants.

- ***The use of Participatory Planning and Design:*** Local government authorities, urban planners, and community leaders should engage both resettled and host communities in the planning and design of settlement layouts. This ensures housing, communal spaces, and infrastructure meet the functional, cultural, and social needs of all users, promoting harmonious spatial integration
- ***The use of culturally sensitive Land use Zoning:*** The Land use zoning should allocate priority areas for livestock keeping, cultivation, and cultural practices while ensuring compatibility between uses. Architectural principles of spatial organization, circulation, and site hierarchy should guide the layout to optimize access, usability, and coexistence.
- ***The provision of adequate grazing and resource spaces:*** The local government should plan and allocate sufficient land and water resources to support the pastoral lifestyle, including well-organized grazing areas and green pastures. Thoughtful spatial planning ensures resources are accessible without disrupting residential layouts or community circulation.
- ***Provision of equitable compensation:*** Relocation programs should include equitable compensation and provision of essential infrastructure, designed with architectural considerations such as durability, climate responsiveness, and cultural appropriateness, to support sustainable livelihoods.
- ***Strengthened Community Governance through Spatial Organization:*** It is recommended that accessible and shared communal spaces be designed to strengthen community governance and support coordination, decision-making, and conflict resolution between resettled and host communities, with local government authorities and policymakers responsible for their implementation.

5.5.13 . Summary of Discussion of findings

The findings of this study highlight the unique traditional cultural values of the Maasai Tribe, which are deeply intertwined with their beliefs. The design of traditional Maasai homesteads is influenced by various factors, including environmental conditions, folklore (such as cultural beliefs, proverbs, and narratives), their semi-nomadic lifestyle, social relationships, cultural traditions, rituals, and symbolic meanings. However, the study also revealed that the design

process for both the master plan and housing in Msomera lacked participation from the Maasai people, resulting in a limited understanding of their way of life. Consequently, the designs implemented did not cater to their unique cultural needs. To address this gap, the study outlines strategies for integrating Maasai traditional cultural values into the design of modern houses in Msomera.

By considering these factors, modern Maasai housing can effectively blend traditional values with contemporary needs, ensuring the preservation of their rich cultural heritage. The overall findings reinforce the objectives of the National Human Settlements Development Policy (URT, 2000), National Housing Policy (URT, 2012) and National Housing Policy (URT, 2016), highlighting the need for culturally responsive housing and participatory planning in resettlement schemes such as Msomera. The study further suggests that stronger integration of traditional values into design practice will enhance policy implementation in rural and pastoralist contexts.

CHAPTER SIX

6. Conclusion and Recommendations

6.1 Introduction

This chapter summarizes the findings of the research focused on the housing provisions during the resettlement of the Maasai from Ngorongoro to Msomera-Tanga. It reflects on the challenges faced, the cultural implications of housing designs, and the overall effectiveness of the strategies employed. The insights gained from this review aim to inform future efforts in providing sustainable housing solutions that respect and incorporate the unique cultural values of the Maasai community.

6.2 An overview of the study

This study examines the housing provision process during the resettlement of the Maasai community from Ngorongoro to Msomera-Tanga, focusing on how socio-cultural factors influence the sustainability of resettlement housing. It highlights the gap in current housing policies and programs, which prioritize the quantity of housing units over cultural relevance and community needs. Using a mixed-methods approach combining interviews, observations, focus group discussions, site surveys, and spatial analysis through ArcGIS Pro, the study investigates the housing challenges and environmental changes affecting the Maasai's pastoral lifestyle. The findings reveal that, despite government efforts and community adaptation, relocation has disrupted cultural identity and social cohesion. The study concludes by recommending participatory design approaches that involve the Maasai in housing decisions to ensure culturally responsive and sustainable resettlement outcomes.

6.3 Key findings of the study

ii) Lack of community participation

The relocation of the Maasai from Ngorongoro to Msomera-Tanga was non-participatory, with housing designs imposed from above that neglected their cultural needs, resulting in social fragmentation and cultural disconnection.

iii) Lack of Socio-Cultural Integration

The relocation housing design at Msomera failed to incorporate Maasai cultural and spiritual elements, resulting in a loss of traditional spaces for rituals, ceremonies, and ethnomedical practices. This has led to cultural detachment and weakened community identity.

iv) Inadequate Spatial Planning and Design

The provided housing units and settlement layout did not accommodate the Maasai's traditional pastoral and polygamous family structures. Limited residential plots, insufficient space for livestock, and lack of communal areas disrupted social cohesion and traditional ways of life.

v) Conflict between Traditional and Imposed Settlement Patterns

The grid layout imposed at Msomera conflicted with the Maasai's traditional circular boma arrangement. This spatial mismatch compromised livestock security, reduced land for grazing, and limited the expansion of family compounds, creating tension between cultural practice and imposed planning systems.

vi) Unsuitability of Construction Materials

The shift from traditional materials (mud, sticks, cow dung, and thatch) to industrial ones (cement blocks, iron sheets) led to thermal discomfort and cultural alienation. The new materials, though durable, failed to reflect Maasai cultural identity and climatic needs, prompting residents to modify or rebuild structures using traditional methods.

vii) Climatic Incompatibility of New Housing

The new settlement area (Msomera) has a warmer, drier climate compared to Ngorongoro's cooler, wetter conditions. Modern housing designs and materials were not responsive to these climatic differences, resulting in poor thermal comfort and forcing residents to adapt by constructing additional huts with hearths for warmth.

6.4 Major Research Output

The study's major output is the comprehensive identification of traditional Maasai architectural values and their cultural significance in housing design. It highlights that the resettlement to Msomera-Tanga overlooked these values, resulting in modern housing that does not fully reflect Maasai cultural needs. The research further reveals that the design process of modern housing was not participatory, limiting community input. Based on these findings, the study proposes practical, culturally sensitive, and sustainable strategies to integrate traditional Maasai values into modern housing, thereby supporting heritage preservation and enhancing the effectiveness of future resettlement projects.

6.5 Conclusions

The research reviewed the process of the housing provisions during the resettlement of the Maasai from Ngorongoro to Msomera-Tanga and investigated the challenges hindering sustainable housing provision, specifically concerning the Maasai indigenous Community. It is therefore recommended that the current housing layout at Msomera be revised in collaboration with policy makers to reflect Maasai cultural values by aligning with traditional settlement patterns and improving functional spaces for both people and livestock, thereby enhancing overall comfort, usability, and community activities.

Objective 1: To identify the traditional architectural values of Maasai housing following their resettlement from Ngorongoro to Msomera-Tanga.

This research has effectively identified the unique traditional cultural values of the Maasai tribe that influence their housing lifestyle, revealing principles and beliefs that shape housing design within their cultural context. These values, compared between Ngorongoro Conservation Area (NCA) and Msomera, focus on key aspects such as housing planning, housing form, spatial requirements, homestead organization, materials and construction techniques, ventilation and lighting, social services, and linkages to important communal spaces like grazing lands, spiritual sites, ethnomedical sites, water sources, and salt licks. The findings reveal that traditional Maasai architecture emphasizes communal living, cultural symbolism, and sustainable practices, which are often overlooked in contemporary designs. An in-depth understanding of these architectural attributes highlights the cultural significance of traditional Maasai housing, emphasizing the need to incorporate these values into modern designs to

preserve their rich heritage. Integrating traditional Maasai values into modern housing can create an environment that honors their cultural heritage while meeting the needs of current and future generations, fostering a sense of belonging and continuity within the community.

Objective 2: To analyze how the traditional Maasai cultural values influence Maasai housing architecture in Msomera-Tanga.

The Maasai traditionally lived in settlements that reflected their cultural practices, social relationships, and environmental factors, but the transition to a formal settlement in Msomera has hindered their flexibility and adaptability in organizing living spaces. A key issue is the absence of the "orupie" hearth, vital for warmth, cooking, and fostering family gatherings, which disrupts their culture. While external kitchens have been adopted, they lack sustainable design. Current housing designs do not provide adequate privacy for rituals, both inside and outside, such as the "ndaasa" for girls' and boys' circumcision. While toilets are traditionally placed outside the boma for privacy reflecting beliefs such as fathers not wanting to be seen by their children this study suggests that modern design alternatives could gradually be integrated over time. Furthermore, the orientation of the Maasai homestead, which traditionally follows the cultural axis "Kopkop" for blessings, is disregarded in the new housing, which does not align with the sunrise and sunset. The architecture also overlooks the polygamous nature of Maasai families, forcing them into single-house living arrangements. Light and ventilation is poor for housing at NCA but well improved at Msomera. Additionally, the lack of livestock enclosures limits social gatherings and security. The contemporary housing styles fail to reflect Maasai cultural identity, with poor consideration of local materials for building components. Disruptions to their social structure and environmental links have resulted in inadequate access to water and communal spaces, while overgrazing has led to land degradation and water scarcity. These findings highlight the challenges the Maasai face in adapting to their new living spaces at Msomera.

Objective 3: To analyze the approach used in the design process of Modern housing provided at Msomera-Tanga.

The study revealed that the design process for both the master plan and housing was not participatory. The way of life of the Maasai people was not thoroughly understood, and they were not involved in the design and provision of their housing. As a result, the designs implemented did not cater to their unique cultural needs or align with their lifestyle. Many

Maasai families are polygamous, living with their wives, children, and livestock in the same compound. This arrangement has led to issues such as inadequate security within their homestead and animal enclosures, as well as a lack of privacy. Furthermore, the disruptions to their social structure and environmental linkages areas where they conduct rituals and gather medicinal plants have been significant. These challenges have been evident as the Maasai community attempts to adapt to their living spaces in Msomera. By implementing a participatory design approach effectively, it is easy to meet cultural needs, fostering sustainable housing solutions that support relocated individuals' livelihoods and preserve their cultural heritage.

Objective 4: To identify ways in which traditional Maasai cultural values can be integrated to positively influence future Maasai housing resettlement projects in Tanzania.

This study identifies methods to integrate Maasai traditional cultural values into the design of modern houses in Msomera, where the ongoing relocation of the Maasai from Ngorongoro and other areas like Kitwai B-Simanjiro and Saunyi Kilindi is taking place. As relocation projects for indigenous communities, especially the Maasai, are expected to continue in future generations, the study highlights key ways to preserve their cultural heritage in modern housing design

Sustainable Hearth Integration: To maintain the traditional hearth, it is essential to adopt sustainable practices that reduce indoor pollution, which can adversely affect health. Utilizing biogas, improved cook stoves (ICS), and outdoor kitchens can significantly lower harmful emissions while honoring traditional cooking methods.

Adhering to Spatial Qualities: Designing homes that respect the unique spatial qualities of Maasai homesteads is critical. This involves creating spaces that can accommodate polygamous families and support both indoor and outdoor rituals. Privacy should be a priority, with layouts that feature livestock enclosures, courtyards, and multiple housing units arranged according to cultural significance.

Cultural Identity in Homestead Organization: The arrangement of the homestead should reflect Maasai cultural patterns to enhance security and identity. Thoughtful placement of fences, housing layouts, and livestock enclosures is necessary to ensure the design aligns with traditional values and practices.

Traditional Orientation of Homesteads: The orientation of the homestead, or boma, plays a vital role in Maasai architecture. Aligning the layout with the cultural axis known as Kopkop is important, as it symbolizes blessings for cattle, children, and community prosperity, thereby reinforcing the spiritual connection to the environment.

Reflecting Maasai Identity in Design: The design of buildings should reflect Maasai identity. The manyatta, or traditional dwelling, symbolizes unity and community, emphasizing values of togetherness and cooperation among family members and the broader community.

Use of Local Materials: Building homes with local materials that embody Maasai culture is essential. Incorporating colors and textures inspired by traditional clothing and beadwork into both internal and external finishes enhances cultural significance while allowing for modern adaptations.

Participatory Adaptation to New Environments: Designs should be flexible and adaptable to meet the evolving needs of the Maasai community. Involving the Maasai in the design process ensures that their preferences and cultural practices are honored and integrated.

Effective Grazing Land Management: Sustainable grazing land management is crucial for ecological balance. This includes adjusting livestock stocking rates to align with grazing capacity, utilizing zero grazing practices, and implementing rotational grazing.

Conservation of Medicinal Plants: Integrating medicinal plants into relocated zones is important for preserving traditional knowledge and practices. These plants support the Maasai's livelihood and promote cultural heritage, strengthening their connection to the land and its resources.

It is clear that all four research objectives were fully achieved. The study identified the traditional architectural values of Maasai housing, examined how these values influence their adaptation to the Msomera settlement, evaluated the non-participatory design process that led to culturally misaligned housing, and proposed practical strategies to integrate Maasai cultural principles into future resettlement projects. Collectively, these findings confirm that the research has comprehensively addressed all guiding research questions and provides culturally informed insights for improving sustainable and appropriate housing for the Maasai.

6.6 Recommendations

6.6.1 General recommendation

Future Maasai resettlement housing projects in Tanzania have to adopt an integrated, participatory, and culturally responsive planning and design approach that harmonizes traditional Maasai architectural values with modern housing standards and local climatic conditions. Government authorities, design professionals, and policy makers should work collaboratively with the Maasai community to ensure that housing interventions respect cultural identity, support pastoral livelihoods, and promote sustainable and climate-adapted living environments.

6.6.2 Specific recommendation

1. Document and Preserve Traditional Maasai Architectural Elements

Design professionals, including architects, physical planners, and engineers, in collaboration with local government authorities and Maasai community, should document and integrate traditional Maasai architectural elements into future housing projects to preserve indigenous knowledge and cultural identity in resettlement areas.

2. Prioritize culturally sensitive planning and design of housing

It is recommended that Urban planners and policy makers should prioritize culturally sensitive planning that incorporates the key traditional cultural values of indigenous communities particularly Maasai tribe during their relocation projects. This approach enhances social cohesion and promotes sustainable development by valuing the tribe's unique heritage in urban planning.

3. Enhancing participatory approach during design and implementation of housing

The Government Authority through its professionals should practice participatory design approach during design and implementation process. This is crucial as it actively involve the Maasai community in every stage of the process. This means conducting thorough consultations to understand their cultural preferences, ensuring that the new designs reflect their identity and lifestyle. This will also value the indigenous knowledge throughout the design process. The views and opinions of the community, particularly those of women who are master builders in the design of their houses, must be listened to and addressed at all stages.

4. Integration of Modern and Traditional Maasai Housing Designs

It is recommended that researchers, architects, and planners should develop prototype housing models that integrate traditional Maasai architectural values, pastoral spatial organization, and climate adaptability with modern construction techniques. Such hybrid designs will promote culturally relevant, durable, and sustainable housing solutions for the Maasai community in resettlement areas. Housing should be improved in both design and layout to enhance durability, functionality, sustainability, and cultural appropriateness, including housing forms, orientation, materials, construction techniques, spatial organization, livestock areas, communal spaces, and access routes.

5. To support Continuity of the Maasai Pastoral Lifestyle

To ensure the continuity of the Maasai pastoral lifestyle in resettlement areas, it is recommended to implement a land use zoning system that allocates sufficient space for residential plots, livestock grazing, and crop cultivation based on user needs and compatibility. This includes providing designated grazing lands, communal saltlicks, and reliable water sources, promoting sustainable grazing practices to prevent bare land expansion, and separating livestock and crop areas to minimize conflicts between pastoral and agricultural activities.

6. Promote Climate-Responsive and Culturally Adapted Housing Design

Future housing designs in Msomera should combine climatic responsiveness with cultural sensitivity, ensuring that Maasai communities remain comfortable, connected to their traditions, and resilient to environmental challenges. This should be done in participatory manner.

7. Culturally Informed and Functional Housing Design with Policy Maker Involvement.

It is recommended that the housing layout at Msomera be revised to reflect Maasai cultural values by following traditional settlement patterns and enhancing functional spaces for both people and livestock. Policy makers should actively participate in the planning and approval process to ensure community needs are incorporated, while modern design alternatives, can be gradually integrated to balance cultural practices with functionality.

6.7 Areas for Further study/Investigation

This research reviewed the housing provisions during the resettlement of the Maasai from Ngorongoro to Msomera-Tanga, finding that while the project achieved some success, it ultimately fell short in sustainably addressing the needs of the Maasai community regarding their cultural values, thereby impacting their cultural identity. It identified how traditional Maasai cultural values can positively influence the resettlement project in Msomera-Tanga. The highlight of this study reveals a significant opportunity for future research by opening the door to developing a prototype design of Maasai housing that addresses the community's needs.

This study is rich in areas for further studies because it highlights multiple unresolved issues related to cultural sustainability, spatial planning, climatic adaptation, and community participation. The findings expose gaps in how housing design, materials, and settlement patterns align with Maasai cultural values, pastoral lifestyles, and environmental conditions

These gaps open opportunities for future research on the following areas:

i. The impacts of spatial dynamics on cultural transformation in Maasai community resettlement from Ngorongoro to Msomera Tanga

Studying this will provide insights into how spatial planning affects cultural continuity, social cohesion, and the community's ability to maintain traditional lifestyles after relocation.

ii. Assessment of Climatic Responsiveness of Housing Designs at Msomera

Assess how relocated communities adapt to new climatic conditions and identify housing solutions that provide thermal comfort in warmer and drier environments, including passive design techniques and material innovations

iii. Comparative Analysis of Thermal Comfort in Maasai Housing: Ngorongoro versus Msomera

This focuses on how climate and housing design affect comfort in relocated Maasai communities. The findings will guide the design of climate-responsive and culturally appropriate housing models for future resettlement projects.

iv. Developing a prototype design or model for Maasai housing Design

A prototype will be potential to create housing solutions that are culturally relevant and sustainable for the Maasai community. A prototype design will allow researchers and architects to integrate traditional Maasai cultural values, pastoral spatial needs, and local climate adaptability into a practical housing model.

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APPENDICES

Appendix 1: Letters of consent to conduct research

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DEPARTMENT OF ARCHITECTURE AND PHYSICAL PLANNING

Your Ref: _____ Date: 20/03/2024
Our Ref: _____

M/s REGIONAL ADMINISTRATIVE SECRETARY
P.O BOX 5095
ARUSHA

This is to introduce to you MOSES L. KIVUYO who is a
Master student at the Department of Architecture and Physical Planning Makerere
University. He/she is doing a final Research
Project titled AN ASSESSMENT OF RESETTLEMENT OF
MARSAH PEOPLE FROM NGORONGORO TO MCOMERA HANDBON
TANGA
which is in partial fulfillment for the Award of the Degree of Master of Architecture.

Any assistance rendered to him/her will be highly appreciated.


Dr. A. Kiggundu Tamale
Head of Department



MBEYA UNIVERSITY OF SCIENCE AND TECHNOLOGY
OFFICE OF THE DEPUTY VICE CHANCELLOR
ACADEMIC, RESEARCH AND CONSULTANCY

Telephone: +255 (0)25 2957641
E-mail: dvcarc@must.ac.tz
Web: www.must.ac.tz



P.O. Box 131,
Mbeya,
Tanzania.

In reply please quote:

Ref. No. MUST/PF.770/25

Date: 18th January 2024

REGIONAL ADMINISTRATIVE SECRETARY,
P.O BOX 3050,
ARUSHA

Dear Sir/Madam

RE: INTRODUCTION LETTER OF MR. MOSES L. KIVUYO

The subject above refers.

2. The above mentioned person is an employee of Mbeya University of Science and Technology (MUST), Department of Architecture and Art Design.
3. He is a Master student at Makerere University in the Department of Architecture and Physical planning. He is doing a Final Research on the above mentioned topic which is in partial fulfillment for the award of Master of Architecture. The student together with his research team will collect data regarding the research topic. All documents that will be collected in this study are meant for academic endeavour.
4. Thanking you in advance hoping that your office will accord him with appropriate support.
5. With kind regards.

Sub Deputy Vice Chancellor
ACADEMIC RESEARCH & CONSULTANCY
MBEYA UNIVERSITY OF SCIENCE AND TECHNOLOGY

Prof. Godliving Y. S. Mtui

Ag. DEPUTY VICE CHANCELLOR – ACADEMIC, RESEARCH AND CONSULTANCY

MBEYA UNIVERSITY OF SCIENCE AND TECHNOLOGY
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P.O. Box 131,
Mbeya
Tanzania.

In reply please quote:

Ref. No. MUST/PF.770/26

Date: 8th April 2024

REGIONAL ADMINISTRATIVE SECRETARY,
P.O BOX 5095,
TANGA.

Dear Sir/Madam

RE: INTRODUCTION LETTER OF MR MOSES L.KIVUYO

The subject above refers.

2. The above mentioned person is an employee of Mbeya University of Science and Technology (MUST). Department of Architecture and Art Design.

3. He is a Master student at Makororo University in the Department of Architecture and Physical planning. He is doing a Final Research on the above mentioned topic which is in partial fulfillment for the award of Master of Architecture. The student together with his research team will collect data regarding the research topic. All documents that will be collected in this study are meant for academic endeavor.

4. Thanking you in advance hoping that your office will accord him with appropriate support.

5. With kind regards.

THE DEPUTY VICE CHANCELLOR
ACADEMIC RESEARCH & CONSULTANCY
MBEYA UNIVERSITY OF SCIENCE AND TECHNOLOGY

Prof. Godliving Y. S. Mtui

Ag. **DEPUTY VICE CHANCELLOR – ACADEMIC, RESEARCH AND CONSULTANCY**

UNITED REPUBLIC OF TANZANIA
PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

Telegrams: "REGCOM"
Telephone: 2545608/2544850/2544802
Fax No. 2545239/254486
E-Mail: ras@arusha.go.tz
E-Mail: ras.arusha@tanisml.go.tz
Website: www.arusha.go.tz
In reply please quote:



REGIONAL COMMISSIONER'S OFFICE,
ARUSHA REGION,
2 Makongoro Road
P.O. Box 3050,
233101 Seketi
ARUSHA.

Ref. No. FA.18/232/002'U'/77

16 April, 2024

District Administrative Secretary,
P. O. Box 10,
NGORONGORO.

RE: RESEARCH PERMIT

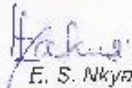
Reference is hereby made to the letter with Ref. No. MUST/PF.770/25 dated 18 January, 2024 from "MBEYA UNIVERSITY OF SCIENCE AND TECHNOLOGY (MUST)" concerning the above underlined subject.

I hereby take this opportunity to introduce to you **MR. MOSES L. KIVUYO** from "MBEYA UNIVERSITY OF SCIENCE AND TECHNOLOGY (MUST)". At the moment he is conducting a research study concerning the *"An Assessment of resettlemen to Maasai people from Ngorongoro District to Msomera Handeni Tanga"*.

Permission is granted to conduct his research from **16th April, 2024** to **30th July, 2024**.

Due to this, you are requested to render administrative assistance to enable him to accomplish his research.

Thank you for your cooperation.


E. S. Nkya

For: REGIONAL ADMINISTRATIVE SECRETARY
ARUSHA

Copy to:
MR. MOSES L. KIVUYO
RESEARCHER

REGIONAL ADMINISTRATIVE
SECRETARY ARUSHA



JAMHURI YA MUUNGANO WA TANZANIA
WIZARA YA MALIASILI NA UTALII
MAMLAKA YA HIFADHI YA NGORONGORO



Unapojibu tafadhali taja:

Kumb: Na. BF.161/203/01-E/37

24 Aprili, 2024

Mkurugenzi Mtendaji,
Halmashauri ya Wilaya ya Ngorongoro,
S.L.P 1,
LOLIONDO, ARUSHA.

Barua pepe: dedi@ngorongorcdc.go.tz

Yah: **MAOMBI YA KUFANYA TAFITI**

Tafadhali husika na mada tajwa hapo juu, na rejea barua yako ya tarehe 19 Aprili, 2024.

2. Nakujulisha kuwa Mamlaka ya Hifadhi ya Ngorongoro inakiri kupokea barua yako na hivyo kibali cha kufanya utafiti kwa **Bw. Moses L. Kivuyo (Mtafiti)** kutoka Chuo Kikuu cha Makerere Uganda kuingia Hifadhini bila malipo kwa ajili ya kufanya utafiti unao husu "An assessment of Resettlement to Maasai People from Ngorongoro District to Musomera Handeni, Tanga".
3. Kibali hiki kimetolewa kuanzia mwezi 16 Aprili, 2024 hadi tarehe 30 Julai, 2024.
4. Tafadhali kanuni na taratibu zote za Hifadhi zizingatiwe wakati wote.
5. Nashukuru kwa ushirikiano wako.


Lohi Zakaria

Kny: **KAMISHNA WA UHIFADHI**

Nakala: Bw. Moses L. Kivuyo (Mtafiti)

Mkuu wa lango la Loduare - kwa taarifa na ukaguzi

Makao Makuu: S.L.P. 1, Ngorongoro Kiroa, Simu: +255-27-252 7006/19
Ofisi ya Kamishna wa Uhifadhi: Simu: +255-27-253 7946
Barua Pepe: ngorongoro@ngorongorcdc.go.tz, Tovuti: www.ngo.go.tz
Ofisi ya Uhusiano: S.L.P 776 Arusha, Simu: +255-27-250 3339
Ofisi ya Machezo: Simu: +255-27-254 4525

Barua zote zielekezwe kwa Kamishna wa Chifadhi

APENDIXE 2: INTERVIEW AND GROUP DISCUSSION GUIDE		
RESEARCH TOPIC	A REVIEW OF THE HOUSING RESETTLEMENT OF THE MAASAI FROM NGORONGORO TO MSOMERA-TANGA.	
OBJECTIVES-1	To identify the traditional architectural values of Maasai housing following their resettlement from Ngorongoro to Msomera-Tanga.	
TARGET GROUP	• Maasai Community Leaders and spiritual leaders • Maasai households' leaders and family members (Women and men)	
	Ngorongoro Conservation Area: Maasai who are reluctant to leave NCA	
TARGETED QUESTIONS	01	Why are you reluctant to leave NCA and move to Msomera and other areas of relocation?
	02	How do you coexist with wildlife in NCA?
	03	Are there any gender-specific roles or responsibilities in Maasai construction?
	04	Can you describe the overall spatial requirements and layout of Maasai homestead? State the significance of each?
	05	What are the key architectural features of Maasai homestead? What are their significance in Maasai culture?
	06	What materials are commonly used in Maasai construction?
	07	Are there any specific techniques or methods used in Maasai construction? What is the significance of each?
	08	What are the cultural activities and rituals performed in the indigenous Maasai house?

	09	What are the cultural activities and rituals associated with Maasai cattle knaal?
	10	How do Maasai homes adapt to the local environment and climate?
	11	Are there any rituals or ceremonies associated with Maasai architecture?
	12	How do Maasai architectural practices contribute to the overall identity of the tribe?
	12	Do you have common spaces around your homestead, and how are they utilized?
	14	Can you identify common spaces away from your home, and how do you use them?
	15	What challenge do you face on utilizing these communal spaces?
		Msomera: Adapting to New Housing in Msomera
	01	What motivated your decision to move to Msomera?
	02	What concerns do you have about moved away from your traditional design and way of life?
	03	How have you adapted to the new contemporary housing provided in Msomera?
	04	What elements of traditional Maasai architecture have you tried to incorporate into your new homes?
	05	How do you feel about the functionality and comfort of contemporary housing compared to your traditional homes?
	06	What challenges have you faced in adapting to the modern architectural styles?

	07	In what ways do you believe the new housing affects your community's cultural identity?
	08	What are the primary communal spaces in Msomera where you gather for social, cultural, and pastoral activities, and how do these spaces support your daily pastoral lifestyle?
	09	In what ways do these common areas facilitate the management of livestock and other pastoral practices, and how do they contribute to maintaining your cultural traditions?
	10	How have the common spaces in Msomera evolved since your relocation from Ngorongoro, and what challenges or opportunities do they present for sustaining your pastoral way of life?
OBJECTIVES-2	To analyze how the traditional Maasai cultural values influence Maasai housing architecture in Msomera-Tanga.	
TARGET GROUP		Maasai Community elders and Spiritual leaders Maasai households' leaders and family members (Women and men)
TARGETED QUESTIONS	01	Since relocation to Msomera, what architectural changes have you observed compared to your previous homes in Ngorongoro, and how do these changes reflect or alter your cultural values?
	02	What are the significance of core cultural values of the Maasai, in the architecture of their housing?
	03	How do the designs of homes and communal spaces play role do in maintaining cultural practices?
OBJECTIVES-3	To analyze the approach used in the design process of Modern housing provided at Msomera-Tanga.	
TARGET	1. Government Officials	

GROUP	• Project Manager of relocation project • Professionals: Architect, Civil Engineer, Town planner, Land surveyor. 2. Maasai community members	
TARGETED QUESTIONS	GOVERNMENT OFFICIALS	
	Project Manager of relocation project	
	01	What were the primary objectives of the housing development project in Msomera?
	02	According to the resettlement process, what were the key steps involved in relocating the Maasai Tribe from Ngorongoro to Msomera-Tanga?
	03	Can you describe any challenges faced during the planning and implementation phases?
	04	What measures, if any, has the government taken to address the concerns and needs of the Maasai community during the resettlement process?
	Professionals: Architect, Civil Engineer, Town planner, Land surveyor.	
	01	What key steps were involved in designing housing for the Maasai resettlement from Ngorongoro to Msomera-Tanga?
	02	How were community members involved in the housing design process?
	03	What methods were used to gather input from the Maasai community during the planning stages?
	04	How do the final housing designs reflect the cultural and social needs of the Maasai community?

	1. Maasai community members	
	01	Can you describe how you were involved in the housing design process?
	02	What specific feedback did you provide regarding the housing designs, and how was it received?
	03	Do you feel that your cultural needs and preferences are considered in the housing designs? Can you give examples?
	04	What challenges did you face in expressing your needs or concerns during the design process?
	05	Are there any features or services that you feel are missing from the new housing development?
	06	How do you feel about the final housing designs? Do they meet your expectations and needs?
OBJECTIVES-4	To identify ways in which traditional Maasai cultural values can be integrated to positively influence future Maasai housing resettlement projects in Tanzania.	
TARGET GROUP	Maasai Community leaders and elders Maasai community members (Women and men)	
TARGETED QUESTIONS	01	How can the design of your housing and communal spaces be improved to better preserve your cultural identity?
	02	What specific architectural features do you believe are essential for reflecting traditional Maasai values in your community at Msomera?