

THESIS

NETWORKS OF LIFE IN THE ERA OF CLIMATE CHANGE: UNTANGLING THE  
INDIGENOUS PEOPLES' MOBILITY IN THE LARGEST WETLAND OF THE AMAZON

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## ABSTRACT

### NETWORKS OF LIFE IN THE ERA OF CLIMATE CHANGE: UNTANGLING INDIGENOUS PEOPLES' MOBILITY IN THE LARGEST WETLAND OF THE AMAZON

Moxeño-Trinitario and Yuracaré Indigenous communities in the Llanos de Moxos, Bolivia are facing depopulation and the many different challenges that come with it. Despite past community efforts to keep or increase the number of families living permanently in their territories, communities' population has decreased since the 1990's, and especially since the largest flood of the 21<sup>st</sup> century hit the area, in 2014. Throughout history, Moxeño-Trinitario and Yuracaré families have moved across vast spaces in the Bolivian lowlands, responding to changes in the environment, inter-ethnic tensions, and the multiples pressures of colonization. More recently, Indigenous community members have migrated to various parts of the country and to other countries looking for education, medical care, employment and better wages to support the increasing cost of living in their communities. This has led to low population levels in certain communities, and the identification of depopulation as a key problem to address by community members and Indigenous authorities. In this thesis I present a research project carried out in collaboration with the Organization of Riverine Indigenous Communities of the Mamoré River (*Subcentral de Comunidades Indígenas Ribereñas Río Mamoré* SCIRRM) and the Llanos de Moxos Working Group (GTLM per its acronym in Spanish) to investigate the patterns of mobility of Indigenous families, and the drivers and challenges associated to this phenomenon. Drawing on a qualitative approach that combined interviews, a workshop, observation

and document analysis, the project examined the characteristics of Indigenous families' mobility, its driver and effects.

The main findings shed light on the complex relationships between the forces that drive people to migrate and the challenges this poses to reproduce their life systems. The identified reasons for people leaving their communities include lack of basic services such as education and health care, lack of income sources and employment opportunities, and climate change effects – especially floods. The effects are wide-ranging: from schools being closed (because they do not reach the minimum number of children) – driving further migration; to loss of cultural practices and knowledge. Depopulation and mobility patterns also pose challenges to natural resource management and conservation. This research contributes to the scholarly field of human mobility by providing a case study that explores human movement patterns and the interconnectedness of driving forces and effects.

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# 1. INTRODUCTION

The role of Indigenous Peoples in global environmental stewardship is increasingly recognized. This is not only because their lands constitute at least 28% of global land surface, including key ecosystems (Garnett et al., 2018), but also because the extensive cumulated knowledge they hold and the governance practices, they have adapted over millennia allow them to manage those lands in ways that align with preserving ecosystem functions. Thus, according to the International Work Group for Indigenous Affairs (IWGIA), there is an emerging consensus that respecting Indigenous Peoples' rights is one of the most effective means in the fight against climate change.

At the same time, Indigenous Peoples are disproportionately affected by the effects of climate change and the resulting degradation of social-ecological conditions in their territories, due to their dependency on healthy ecosystems for the (re)production of their livelihoods and cultures. Floods, droughts, changing rain patterns, forest fires, and other slow-onset and extreme events are eroding livelihoods, health, and security. These impacts force Indigenous Peoples to adopt life strategies that often include moving within and beyond their territories and establishing connections/relationships with other rural or urban spaces (Peluso, 2015).

While mobility can be considered an adaptation strategy, it also poses challenges for Indigenous territorial governance, cultural (re)production, and communal wellbeing. Despite its far-reaching implications, the complexity of Indigenous Peoples' mobility strategies in the context of climate change is understudied and not well understood. Furthermore, in contexts such as the Amazon, mobility is also tangled with pressures

stemming from the intensification of extractive frontiers (e.g. industrial agriculture, cattle ranching, hydrocarbon exploration, mega-infrastructure projects, mining, etc.) and its impacts (e.g. resource depletion and degradation, land use change, wildlife trafficking, forest fires, exposure to diseases and violence, etc.) (Kroger, 2022; Buclet, 2021; Science Panel for the Amazon, 2021).

The aim of this thesis is to contribute to understanding the patterns, drivers, and challenges linked to Indigenous Peoples' mobility in the context of climate change. To advance this subject, I address the following questions: a. How are human mobility patterns of residents of Indigenous communities characterized? What are the functions they attribute to the places they move to and from? b. What are the drivers of mobility and what is the role of climate change among them? and c. What challenges do people attribute to mobility? To answer these questions, I engage with the field of human mobility through empirical research with Indigenous communities in the Bolivian Amazon, and specifically in the Llanos de Moxos (LdM) region, the largest wetland complex of the Amazon basin (GTLM, 2022).

Based on the identification of “depopulation” as a key challenge for the Indigenous communities of the upper Mamore River in their territorial management plan (SCIRRM, 2023), this study adopted a collaborative research approach in which Indigenous communities' authorities were engaged in the prioritization of information gaps (Alonso-Yanes et al, 2019). Drawing on qualitative ethnographic methods, I conducted interviews, one workshop, observation, and document analysis. The results present an overview of historical population dynamics trends and mobility patterns and functions of rural and urban places, followed by an analysis of drivers and effects mentioned by participants. I

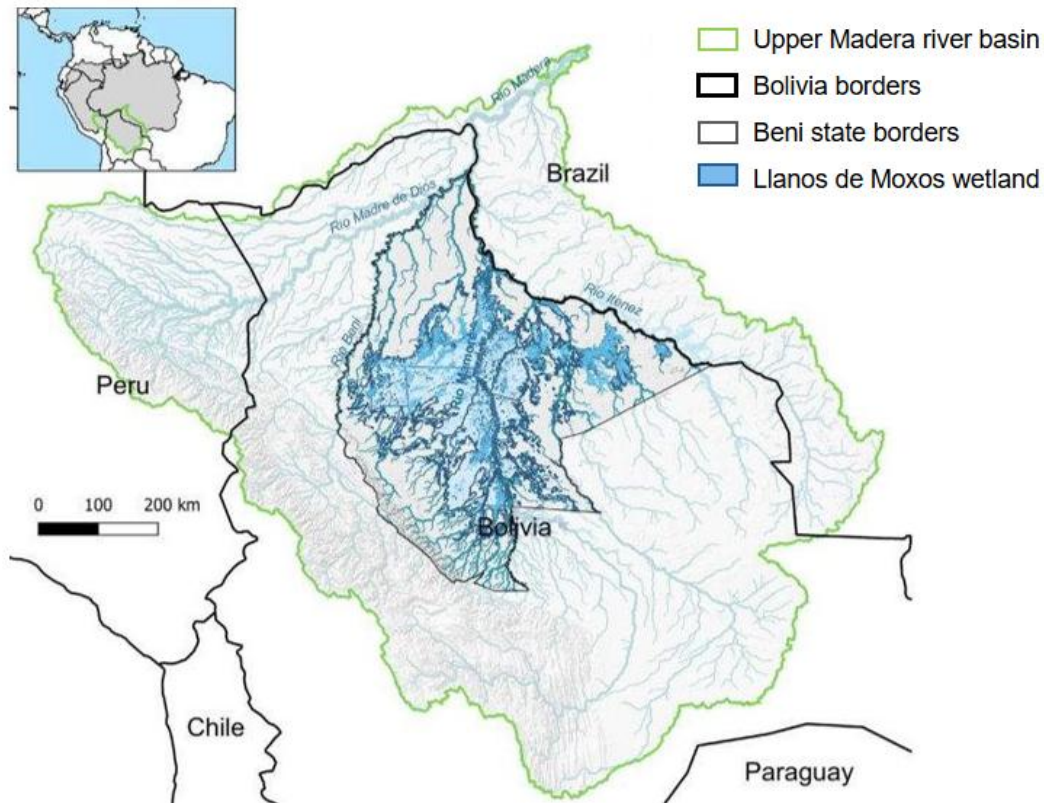
argue that mobility drivers have changed over time and are currently exacerbated by the increasing effects of climate change. Mobility drivers and effects are also strongly intertwined between and among them, tending to amplify over time. Furthermore, the areas through which Indigenous peoples in the LdM move, show persistent relations with their ancestral territories. And lastly, mobility has important implications for natural resource management and conservation as access to and capabilities to control resources use change. This thesis contributes to the literature on human mobility by expanding its focus from mainly urban studies to rural areas and the rural-urban continuum. The concluding remarks provide insights to support Indigenous future planning processes in the context of climate change, in LdM and beyond.

## **2. BACKGROUND AND THEORY**

### **2.1. The Llanos de Moxos context**

The Llanos de Moxos (LdM) is an important wetland region, which roughly corresponds to the department of Beni in the Bolivian Amazon (Figure 1). This rich region is currently inhabited by 18 Indigenous groups and is considered a unique biological and cultural landscape that combines 120,000 km<sup>2</sup> of forest, savannas, and wetland ecosystems, with diverse forms of space occupation and use throughout history (Vogl et al., 2022).

There is evidence of human occupation in the LdM dating back more than 10,000 years (Denevan, 1966). This long interaction between people and the surrounding ecosystems led to the emergence of a dynamic biological and cultural landscape, shaped by seasonal flooding and corresponding human adaptations through the development of infrastructure for water management, mobility, and agriculture (e.g. raised fields, canals, mounds, forest islands, etc.) (Lombardo et. al., 2013; Whitney et al., 2024). Seasonal floods are an integral part of the LdM landscape and have shaped human and other-than-human life and their movement in the region for millennia. Seasonal floods have driven semi-nomadic human occupation patterns to deal with the movements of rivers. To date, communities “appear”, “move”, and “disappear”, in response to not only environmental, but also social and economic factors.



**Figure 1.** Llanos de Moxos Wetland location in Bolivia, South America

**Source:** Adapted from Vogl et al, 2022

Throughout time, the Indigenous residents of LdM have experienced centuries of colonization through processes of dispossession, sedentarization, evangelization, and oppression. The Indigenous population in LdM decreased in 90% during the first 100 years of European settlement, mainly due to new diseases, slavery, and genocide (Science Panel for the Amazon, 2021; Wolfe, 2006; Denevan, 1980). With the establishment and later dissolution of the Jesuit missions between the 17th and 18th centuries; the creation of the Republic of Bolivia in 1825, which perpetuated the oppression of Indigenous peoples and their denial of political participation (Paz, 1991); the pressures stemming from the rubber “boom” until the 1920s (Lehm, 1999); and the

subsequent expansion of agro-industrial frontiers and rapid urbanization—dynamics characteristic of the development process—Indigenous communities in the LdM were forced to retreat to increasingly marginal spaces, limiting their ability to move freely.

Development has long been associated with the phenomenon of migration from rural areas to urban centers. Despite people having been present and moving from, within and to the Amazon for millennia, during the post-World War II period, governments from the region nurtured the idea of an empty Amazon, which needed to be occupied to develop (Hecht & Cockburn, 2010). Thus, new settlements were promoted to explore, occupy and develop the ‘unused’ territories through the deployment of agrarian reforms, urbanization and infrastructure projects, along with mining, energy and agroindustry expansion (Science Panel for the Amazon, 2021). Such ideas and dynamics resulted in the differentiation and segregation of Indigenous Peoples affecting their social, cultural and political relationships with their territories, and influencing current occupation patterns. More recently, the increasing sedentarization of Indigenous Peoples in the LdM has also resulted from the need to access basic services like education or health care, which are assigned to jurisdictions fixed in space, and from growing urbanization along with its increasing labor demand.

To reclaim rights over their ancestral territories, Indigenous peoples from the LdM joined the “March for Territory and Dignity” (*Marcha por el territorio y la dignidad*) in 1990 (SCIRRM, 2022; Lehm, 1999). The march of Indigenous Peoples from the city of Trinidad, in the lowlands, to La Paz, where the national government seats, demanded the right to territory, natural resources, respect to their self-organization and governance, equal distribution of national budget, respect to Indigenous identities and cultures, political

participation and for Indigenous people to be recognized as citizens deserving of rights from the state (SCIRRM, 2022). The massive mobilization resulted in the recognition of Communitarian Territories of Origin (*Tierras Comunitarias de Origen TCOs*) (Lehm, 1999). However, not all Indigenous territories have been granted legal status as TCOs, and external pressures continue threatening them.

Besides the political and social struggles, Indigenous residents of the LdM face increasing threats due to climate change effects. This region is characterized by fluctuations between droughts and floods, and due to its flat topography, seasonally flooded areas can be exceptionally large (GTLM, 2022). Ronchail et al. (2005) have observed increases in inundations in the Mamoré River basin since the 1980s, due to rainfall anomalies in the floodplains and in the headwaters of the Andes. Moreover, Vogl et al. (2022) projected that the magnitude and frequency of extreme precipitation will increase to 8% by mid-century and even more by the end of the century. These climate effects can potentially complicate the drivers and effects of mobility of Indigenous communities in the LdM.

### *2.1.1. Subcentral de Comunidades Indígenas Ribereñas Río Mamoré*

The Organization of Indigenous Riverine Communities of the Mamoré River (SCIRRM) unites 12 Indigenous communities (9 Moxeño-Trinitario and 3 Yuracaré): San Bartolo, El Boibo, Fortuna, El Rosario, Marsella, San Antonio de Loras, Santa Rosa Paraíso, El Masí, Loma del Amor, La Gran Cruz, Ibarecito and Nueva Esperanza; which are located along the mid-upper Mamoré river in the Loreto (Marban province) and Trinidad (Cercado province) municipalities. About 97 families or 421 inhabitants are currently members of the 12 communities, which can be accessed from Trinidad and

Camiaco mainly through navigating the Mamoré river (SCIRRM, 2023). Trinidad is the capital and the largest urban area in the department, and Camiaco is the second largest semi-urban community connected by road to the capital (see distances from communities to Trinidad and Camiaco in Table 1 and Figure 2).

**Table 1.** Inhabitants, ethnicity and distance of Communities to urban settlements

Community	Inhabitant families	Ethnicity	Distance to Trinidad [Km]	Distance to Camiaco [Km]
San Bartolo	8	Moxeño-Trinitario	41.8	98.2
El Boibo	7		70.8	58.2
La Fortuna	5		64.8	62.9
El Rosario	11		63.0	65.8
Marsella	12		48.6	104.9
San Antonio de Loras	7		82.1	44.4
La Gran Cruz	3		175.1	48.4
Ibarecito	4		275.6	100.5
Nueva Esperanza	NI		188.3	61.6
Santa Rosa Paraiso	8		Yuracaré	95.0
El Masi	20	104.9		22.8
Loma del Amor	12	118.9		8.7
<b>Total</b>	<b>97</b>			

**Source:** Adapted by the author from the Territorial Management Plan SCIRRM 2022-2031 (2023)



**Figure 2.** Location of SCIRRM Communities along the Upper Mamore River

**Source:** The author, based on the Territorial Management Plan SCIRRM 2022-2031 (2023)

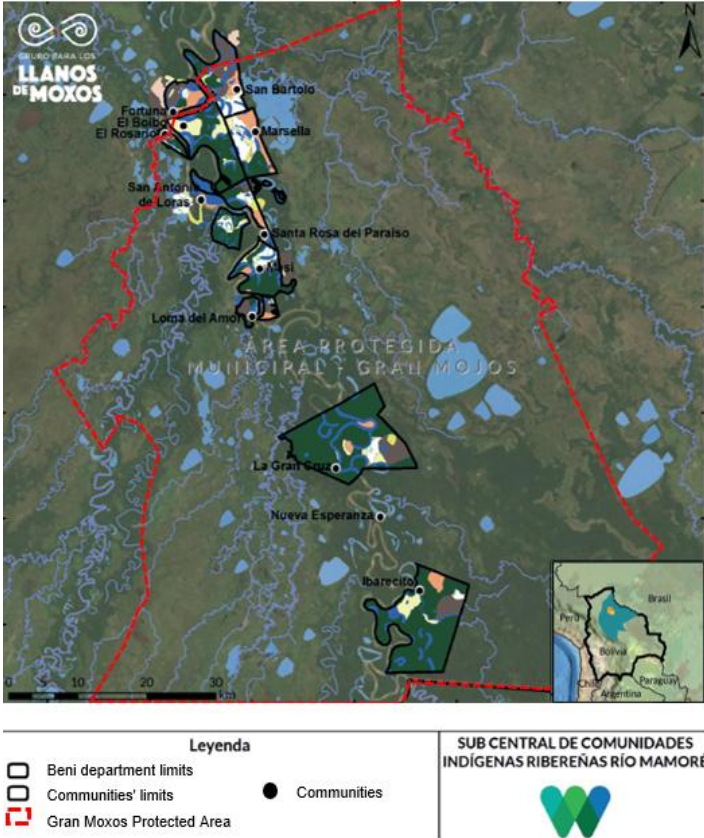
The Moxeño-Trinitario people originated from the Jesuit reduction of the Moxos people in the Mission of “Santísima Trinidad” (Beni’s capital nowadays); their ancestral territory encompassed the floodplains in the south-center of Beni (Figure 4) and they adopted the governance structures of Cabildos, village models, and economic institutions of the Jesuit missions (Lehm, 1999). On the other hand, the Yuracaré Indigenous peoples were not reduced by any religious mission, mainly due to their reluctance to establish conglomerate settlements. They used to live in dispersed settlements within the Ichilo river basin, in the foothills of the Chapare region (current Cochabamba department)

(Figure 4). However, both ethnic groups, like many others, share a historical struggle for legitimate rights to freely move and make use of their natural resources on a communitarian basis. Thus, Moxeño-Trinitario and Yuracaré Indigenous peoples, whose communitarian rights to their territories had been progressively transferred to non-Indigenous through the individualization and liberalization processes (Guiteras, 2011), joined the “March for Territory and Dignity” in 1990 to recover such rights over their ancestral territories (SCIRRM, 2022).

The SCIRRM was founded in 1993 with the aim of achieving territorial rights for the Moxeño-Trinitario and Yuracaré Indigenous communities, which are nowadays affiliated to the organization. In the early 1990s, the SCIRRM became affiliated to the Central de Pueblos Indígenas del Beni (CPIB) - the regional Indigenous organization representing the Indigenous peoples of Beni before the Bolivian state (SCIRRM, 2022). Over decades, the SCIRRM has been successful in getting land titles for 10 out of the 12 Indigenous communities it represents. However, the land entitled to those communities does not cover their ancestral territory, where they used to hunt, fish, collect fruits of the forest, and fulfill their spiritual practices (Figure 4). In 2017, the Gran Moxos Municipal Protected Area (Figure 3) which comprises almost 100% of the territory of SCIRRM communities was created within the jurisdiction and administration of Loreto municipality, with the goal of conserving savanna and wetland ecosystems of the LdM floodplains, as well as promoting connectivity between the Isiboro Sécuré Indigenous Territory and National Park and the Ibare-Mamoré Municipal Protected Area. However, the protected area is also considered a safeguard for Indigenous territories in the face of

land use change pressures on Loreto due to the expansion of the agricultural frontier in and from the neighboring department of Santa Cruz.

Through the process of drafting their diagnostics and plans in 2021, the 12 communities of the SCIRRM identified “depopulation” as a problem of high priority. Some strategies or solutions brought forward by communities in those plans include improving housing, basic services, education, health, improving income sources through livelihood projects, and building infrastructure to deal with extreme climate events. These community perspectives, reflected in communal and territorial level planning instruments, are a starting point for further joint inquiry about the patterns, drivers, challenges, and adaptation strategies linked to the mobility of residents of SCIRRM communities.



**Figure 3.** Current Indigenous communities' territories and Gran Moxos Protected Area

**Source:** Adapted by the author from the Territorial Management Plan SCIRRM 2022-2031 (2023)



**Figure 4.** Approximation to Indigenous communities' ancestral territories

**Source:** Conservation and sustainable development program of the LdM (GTLM, 2022)

## 2.2. Human mobility theory and the Amazon

The concept of human mobility has evolved over time to include different aspects not only related to behavior and decision making, but also about time, space and the latter's potential functions. Wiederkehr et al. (2019) conceptualize human mobility as the “outcome of the interplay between the need, the ability, and the aspiration to migrate”. Later, Zhang et al (2025) conceived human mobility as the phenomena that encompasses the patterns of spatial and temporal movement, and the behavioral dynamics under which individuals and collectives move within and between diverse geographical contexts. Human mobility is not unidirectional, nor monocausal, neither positive nor negative. Thus, its study embraces the multiple directions of human movement, and the impact of

movement to the places of origin, transit, and destination (Boas, 2019). Although human mobility in practice informs evidence-based actions for facilitating emergency response protocols, fostering environmental conservation efforts, or promoting economic development, among others, most of studies in this field have focused on the growing contemporary urban challenges (Zhang et al., 2025; Wang et al, 2022) overlooking the challenges also faced in rural areas, as both spaces function interconnectedly.

The field of human mobility has experienced significant growth during the last 16 years, conveying discussions about mobility patterns, cities, geographies, migration, models, impact, behavior, policy, and travel, among others (Zhang et al., 2025). Human mobility, as a theory, is seen as a critical lens which pays attention to the plurality and politics of human movement. Thus, scholars are increasingly giving attention to exploring the multiplicity of patterns, histories of movement, and material and political conditions under which mobility happens (Boas et al, 2019, 2020, 2022; Suliman et al, 2019). In exploring these multiple factors, the study of different cases in terms of geographies, scales, and cultural contexts matter.

In the case of the Amazon, rural–urban mobility patterns have persisted with the growth of urban areas, while drivers of mobility are becoming more diverse, intertwined, and context-dependent over time (Berman & Wang-Cendejas, 2024). For example, in the case of the Brazilian and Equatorian Amazon, Parry et al (2015) and Davis et al (2017) found that lack of basic services such as schools and healthcare was the main reason for residents from small and isolated settlements to move out. Also, increasing transport costs and difficulties for river navigation during dry seasons restricts the exchange of goods and services to and from isolated areas. Moreover, the increasing presence of rural

populations around urban areas results from the increasing cost of living in remote areas, regardless of the plentiful natural resources. More recently, Berman and Wang-Cendejas (2024) also identified the increasing living costs in rural areas as the dominant driver of rural-to-urban migration since 2000 (i.e., increasing transaction costs of trade exchange, increasing cost of transportation). Indeed, the predominant economic system has forced a shift from traditional to market oriented and wage-based relationships, which results in the movement of rural populations to precarious urban settlements (Science Panel for the Amazon, 2021).

Human mobility between rural and urban spaces, in the Amazon, has been documented to have both positive and negative effects on the environment with consequences for conservation of tropical forests. Access to spaces beyond rural communities and the capability to maintain the rights to land and resources in both places where they reside, enable rural families, who use to only practice farming, fishing, and wood extraction, to diversify their economic activities (Nasuti et al., 2015). However, the protection of rural families' livelihoods, when they live in their rural communities, encourages the conservation of ecosystems, which is lost when people move out (Parry et al., 2010a). These tensions influence the delineation of rights to land and natural resources and their governance. When people migrate temporarily or permanently, rights to natural resources become less clear and nonresidents can take the opportunity to over extract aquatic and terrestrial wildlife in areas perceived as abandoned and their surroundings (Parry, et al., 2010b).

The intertwined relationships between and within negative and positive effects partly result from residents keeping active links with both rural and urban places.

Indigenous populations' outmigration from rural to urban areas or beyond, are, for the most part, not permanent. Many Indigenous families and individuals tend to actively keep links with their communities of origin while taking part in urban life. Moreover, they create new active links between cities and communities while also raising families between both places (Peluso, 2015). Furthermore, these transformations go beyond the urban-rural dichotomy, as gradients in between are increasingly visible (Parry, Peres, et al., 2010). However, the shifts in drivers of decisions to move are complex and require additional research to understand (Berman and Wang-Cendejas, 2023), especially in the current context post Covid-19 pandemic, a deepening economic crisis, political instability, and increasing climate change effects.

In regions where communities are highly exposed to climate threats and lack of capacities to adapt to climate changes, migration is increasing as climate change scales up (Boas, 2019). In the context of climate change and its intersection with economic or social adverse conditions, mobility, as displacement or migration, is recognized as forced. Migration can be adopted as an adaptation strategy to seek safer places seasonally or permanently to set up new homes. In contrast, displacement commonly happens shortly after extreme events involving shorter distances and terms (FAO and UNU-EHS, 2025).

### **3. METHODOLOGICAL APPROACH AND METHODS**

Acknowledging that political views mediate the creation of knowledge around socio-ecological dynamics (Robbins, 2019), and that Indigenous Peoples, who tend to be disproportionately impacted by socio-environmental challenges, are commonly excluded when building and prioritizing scientific agendas, this project adopted a transdisciplinary (TD) approach as an effort to convey academic disciplines and community knowledge to address the problem (Aykut et. al., 2019) of “depopulation of the Indigenous communities”, and to build trust, openness, and fair collaboration with the communities’ members (Sandroni et al, 2023) throughout the research process. Besides TD as main guidance for the overall work in desk and in the field, ethnographic methods were applied for data collection, which are detailed in the following section.

#### **3.1. Data collection**

I adopted a mixed methods approach to assess Indigenous mobility patterns, drivers, and challenges. The methods spanned document analysis, participatory workshops, and ethnographic tools, namely semi-structured interviews, and observation. Table 2 represents how each method aligns with the research questions.

The fieldwork encompassed two visits to the case study region in 2025. The first visit to Beni in March 2025 aimed at building relationships, present the project to Indigenous leaders, gauge interest and consent to conduct the study, and assess feasibility. The second visit was dedicated to conducting empirical research with the SCIRRM communities' members, local partners of the project, and local experts between

June and August of 2025. I adopted a collaborative approach which aimed at engaging community members in the adjustment of the research approach to foster a respectful researcher/community members' relationship and alignment of the process with local governance practices and agendas throughout the fieldwork.

**Table 2.** Research methods used to answer the research questions

Research questions	Interviews	Participatory workshop	Observation	Document analysis
RQ1. How are human mobility patterns of residents of Indigenous communities characterized? And what are the functions of the places they move to and from?	X		X	X
RQ2. What are the drivers of mobility and what is the role of climate change among them?	X	X	X	X
RQ3. What challenges does mobility pose for communities' aspirations?	X	X	X	X

### 3.1.1. Document analysis :

The document analysis included communities and Sub central's Plans for territorial development, data bases of previous census conducted by the Llanos de Moxos Working Group (GTLM), documents provided by the Comisión de Pastoral Indígena del Vicariato Apostólico del Beni<sup>1</sup>, and other data publicly available. Additional literature was searched on web of science, online repositories and Colorado State's University Library using keywords including depopulation in the Amazon, Llanos de Moxos, human mobility, migration, Indigenous population, conservation, and governance, among others.

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<sup>1</sup> The *Comisión de Pastoral Indígena del Vicariato Apostólico del Beni* is an organization part of the catholic church that supports the defense of Indigenous Peoples rights in Beni since the 80's.

### *3.1.2. Participatory Workshop :*

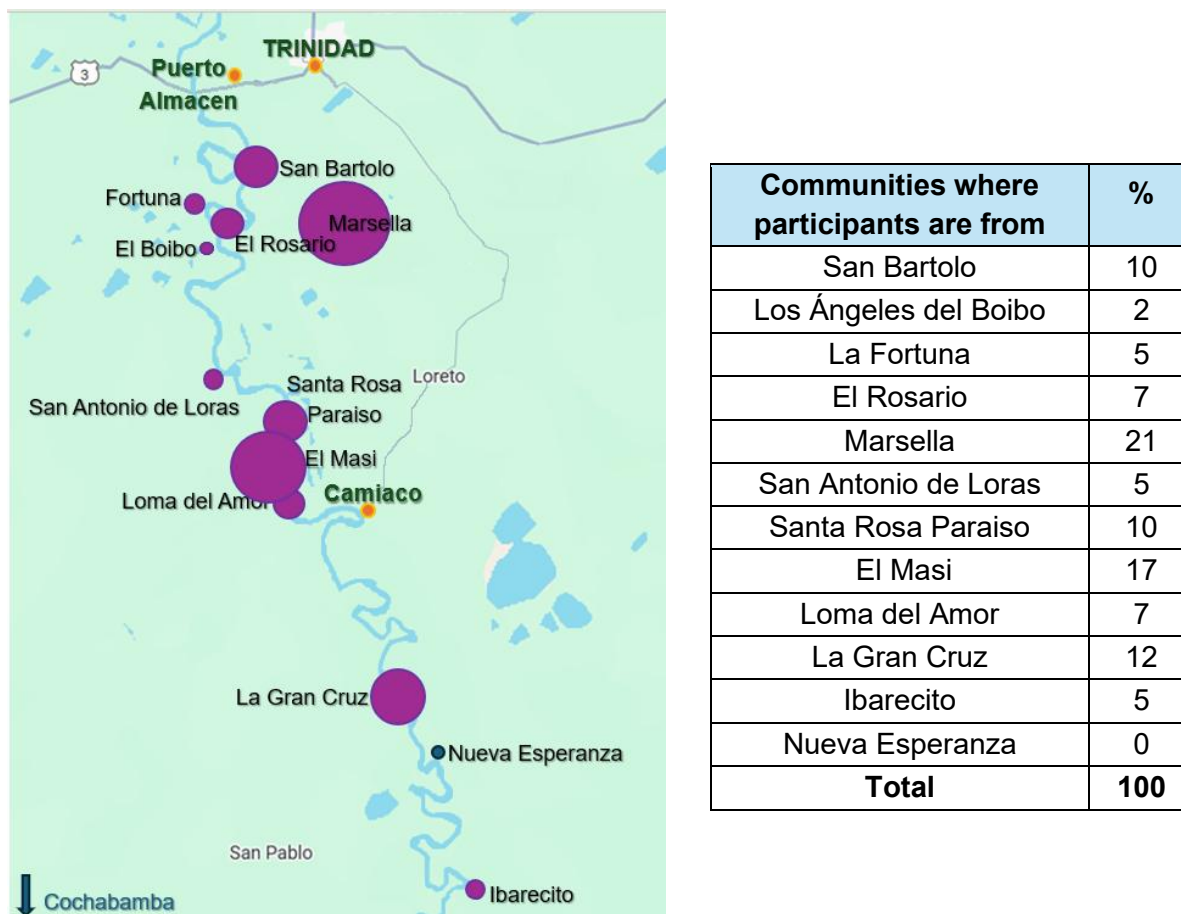
During my fieldwork, I first conducted a participatory workshop with 21 Indigenous leaders and communities' members of the SCIRRM. The workshop had two main goals: gather collective insights on the research questions and jointly reflect on the most appropriate approaches and methods to be applied during visits to communities. Based on the results of the workshop, I adjusted the interview guides, budget, and schedule to visit the communities; Camiaco, a semi-urban non-Indigenous town along the Mamoré river; Trinidad, Beni's capital; Puerto Almacen and Puerto Varador, which are semiurban port areas close to Trinidad.

### *3.1.3. Interviews :*

Interviews are commonly used in qualitative research to study people's daily experiences (Charmaz and Belgrave, 2020). Moreover, semi-structured interviews are useful tools to explore in depth the participants' perspectives through a dialogue to clarify the proposed questions (Bryman, 2012). The semi-structured interview script I applied encompassed questions on personal background, family's mobility histories, importance of places people move from and to, and perceptions about the challenges that depopulation poses to communities (see Annex 1). Interviews lasted about 40 to 90 minutes each. To apply the interviews, I visited 11 Indigenous communities, 3 towns (Camiaco, Puerto Almacen and Puerto Varador), and the city of Trinidad. Overall, I conducted 31 individual interviews, and 4 group interviews spanning a total of 42 communities' members (see Figure 5), of which 40% were women and 60% men; 7% were young adults (20-30 years old), 33% adults (30-60 years old), and 60% were elderly

(60 years or more). Additionally, I interviewed 3 experts working in similar topics with Indigenous communities in LdM.

**Figure 5.** Distribution of participants in interviews-community members



**Source.** Elaborated by the author based on fieldwork data.

### 3.1.4. Observation:

Throughout 15 days of travel to different communities by car and by boat I observed the state of communication and transportation systems, the current state of ports, communities' infrastructure, and houses after the flood that occurred in March-April

2025. When allowed by community members, I also visited and observed abandoned infrastructure such as camellones<sup>2</sup>, churches, schools, and medical posts.

### **3.2. Data analysis**

Most of the interviews were not audio recorded due to denied consent by participants; thus, I used shorthand to capture the answers in my fieldwork diary. Resulting notes were transcribed, and personal data was anonymized accordingly with the preference of participants<sup>3</sup>.

I analyzed the data resulting from interviews, workshop, fieldwork notes, and documents using thematic coding while treating each data set (interview, community story) as an individual case study (Flick, 2018). The coding process comprised a mix of deductive and inductive approaches, where for the inductive portion I coded openly to generate themes and categories related to the cases (Flick, 2018), and paid special attention to categories arising from the participants' narratives; for the deductive portion I used the research questions and the interview guide as a thematic structure (Daly, 2007).

Quantitative data collected through semi-structured interviews about people's mobility patterns (e.g. number of people from each community moving to specific locations) as well as quantitative data from census and community diagnosis were organized and analyzed in Excel. The data about population dynamics were first gathered from communities' histories and the community's diagnosis and plans, which were collected through a community census in 2021. That set of data was supplemented with

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<sup>2</sup> Ancient infrastructures build of land to manage crops in accordance with water dynamics in seasonally flooded areas.

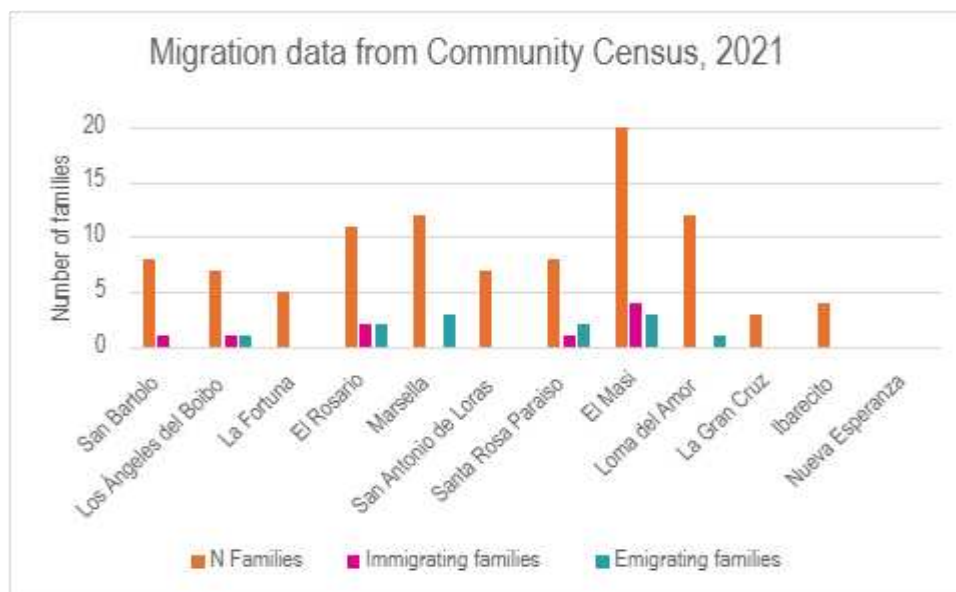
<sup>3</sup> The informed consent was approved through the CSU IRB process.

numbers provided through the interviews for specific events that were important to the participants. The remaining data gaps were filled through a mix of extrapolation and use of average numbers when needed to approach population changes over time.

## **4. RESULTS**

### **4.1. Population Trends and Mobility Patterns**

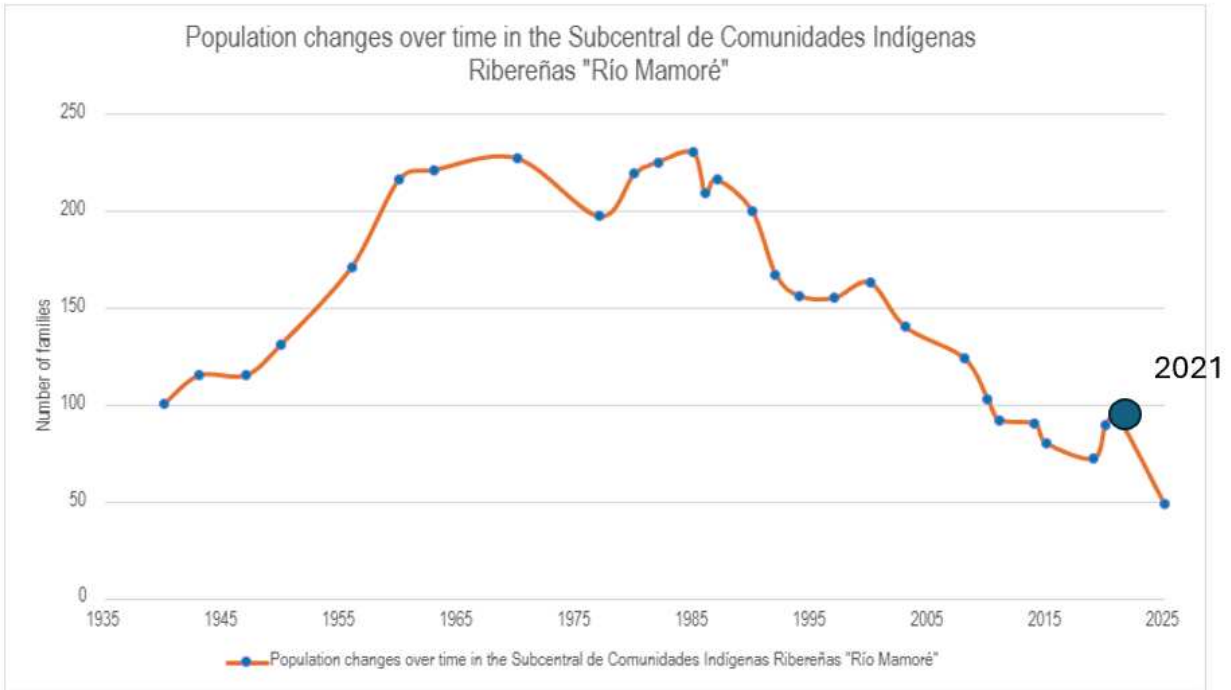
According to the review of the last community census conducted by the Llanos de Moxos Working Group (GTLM) in 2021, there are about 97 families distributed across 11 out of 12 communities. There is no data registered for Nueva Esperanza. That year, about 9 % of the surveyed families had newly arrived at the communities during 2021, whereas about 12 % had emigrated to cities or other rural areas (Figure 3). The remaining families reported staying in their communities. In this census document, the main stated reasons for people to immigrate to SCIRRM's communities were family and improving their living conditions. On the other hand, among the main reasons stated to explain people's emigration are family, getting access to health care, and job seeking. Sixty percent% of immigrants came from other rural communities and 40% arrived from cities. In contrast, 25% of emigrating families left for other rural communities, whereas 75% went to urban areas, especially Trinidad.



**Figure 6.** Population, immigration and emigration during the census in 2021

**Source:** Elaborated based on data from the Community Census carried out by the GTLM in 2021

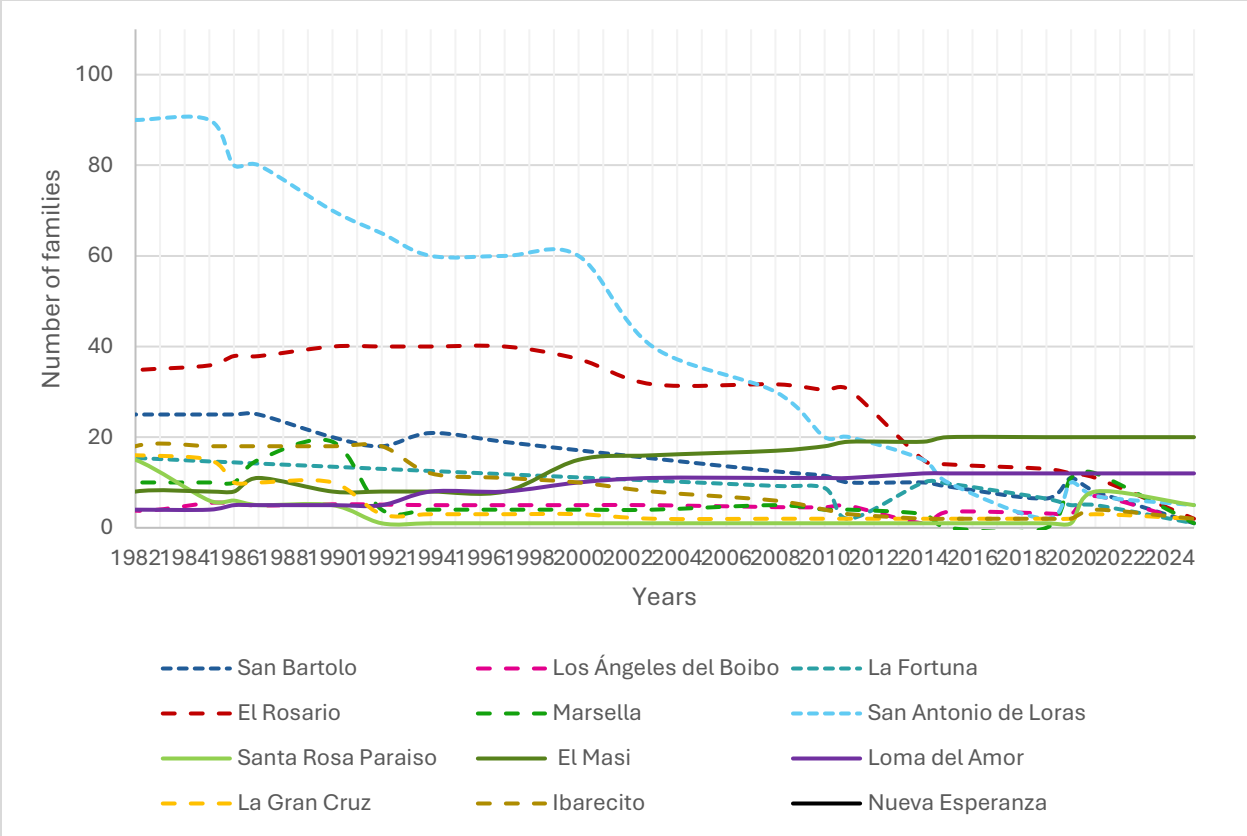
Overall, the population in the SCIRRM has decreased since the first community, San Antonio Loras, was created in approximately 1913 (SCIRRM-WCS-GTLM, 2021a). Over time, population increased as new communities were created and attracted people until the beginning of the 80's. However, what stands out in Figure 4 is the steady decline of population since the late 80's, with the most dramatic fall during the last 10 years.



**Figure 7.** Population dynamics in the SCIRRM

**Source:** Elaborated based on data extracted from Communities' Diagnosis and Plans, and observations during the fieldwork. To build this graph, I merged data from the communities' histories from their diagnosis and plan documents, the census from 2021, and observations from this year. The data gaps between years were filled with statistical extrapolation for each community.

Each community has a different official foundation date. Although most of them had inhabitants before their formalization, Figure 5 shows approximate population changes over time since the year of each community's creation. What is striking is the diversity of population change patterns for each community. For example, San Antonio de Loras has experienced the most dramatic decline in population since the 80's. Similarly, Santa Rosa Paraiso experienced a steady decrease from its creation in 1956 to the early 80's with barely any inhabitants during the 90s and early 2000's. In contrast, La Loma del Amor and El Masi, which are Yuracaré communities, experienced a slow but continual population growth since their creation in 1970 and 1980, respectively.

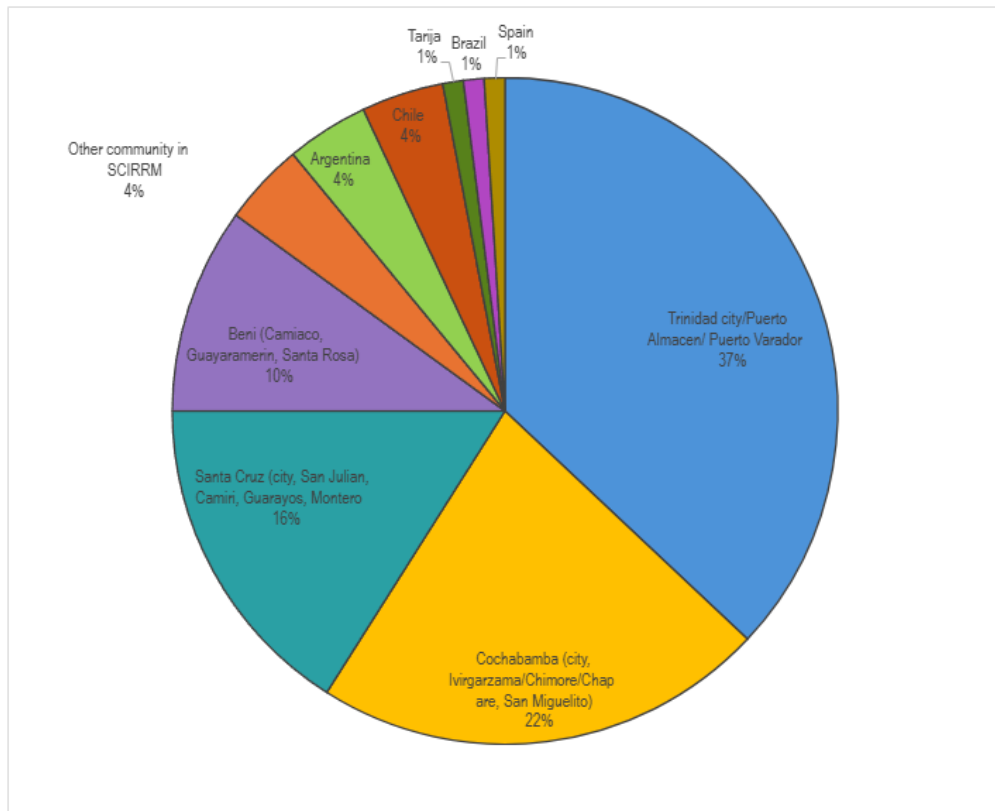


**Figure 8.** Population dynamics in each community of the SCIRRM

**Source:** Elaborated by the author based on data extracted from Communities' Diagnosis and Plans, and from interviews.

In terms of destinations, there are four main places where people move to according to the stories narrated in the communities' plans, and interviews with community leaders, and local experts: the city of Trinidad, the towns of Puerto Almacen and Los Puentes, and the Chapare region in the department of Cochabamba. However, the interviews with community members revealed a wider range of places where their families moved to work or study. Figure 9 shows that 37% of interviewees reported to have family members living in the city of Trinidad; about 22% have family in urban and rural areas of the Cochabamba department, mainly in the Chapare region; about 16% of interviewees have families in urban and rural areas of the department of Santa Cruz; and

10% in other towns in Beni such as Camiaco, Guayaramerín, Santa Rosa among others in the Moxos region. About 4% moved to other communities within the SCIRRM, and finally, a 10% of family members are living in other countries such as Argentina, Chile, Brazil and Spain (Figure 9).

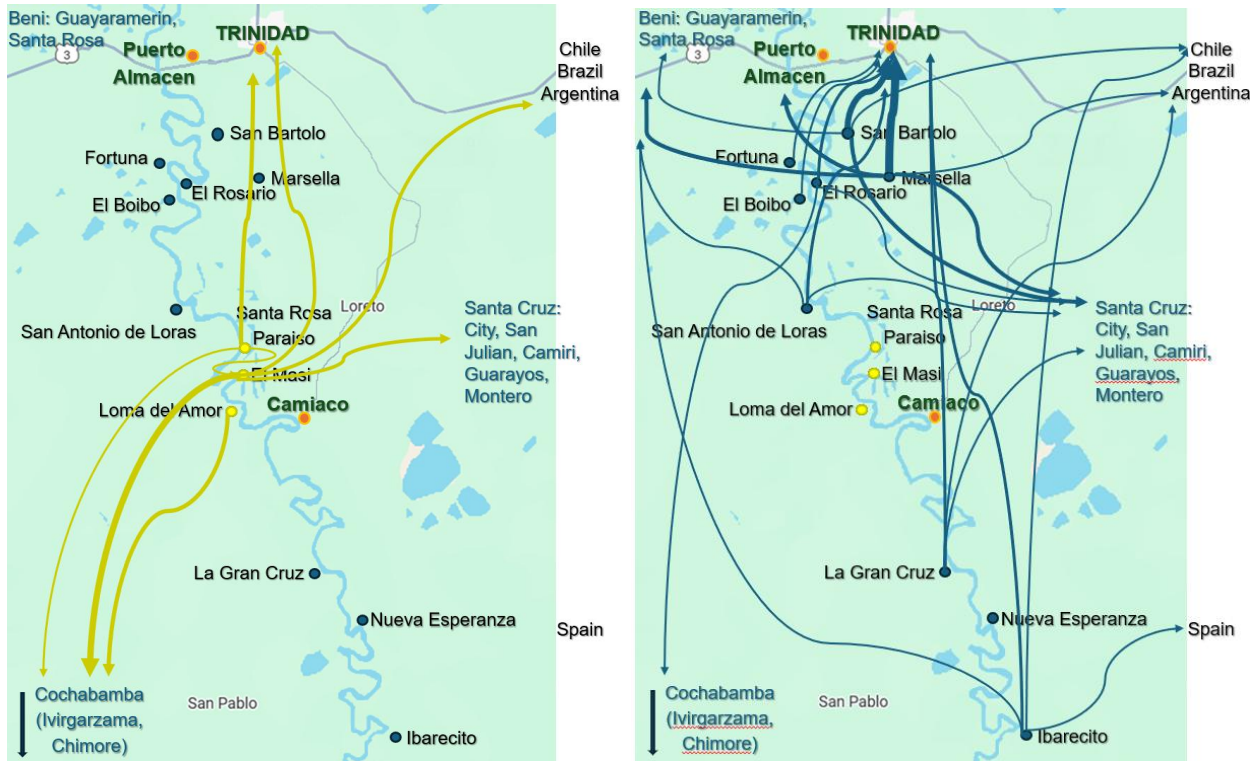


**Figure 9.** Place (city, town, community) where people moved to

**Source.** Elaborated based on interviews data.

It is of relevance to note here the differentiated patterns of movement that Moxeño-Trinitario and Yuracaré residents have. Moxeño-Trinitario people tend to move to Trinidad and other parts of the country almost permanently, whereas Yuracaré people move mainly to the Chapare region seasonally (Figure 10). These differences can be attributed

to the relations people keep with those territories as their ancestral land and where they have extended families.



***Yuracarés routes of mobility***

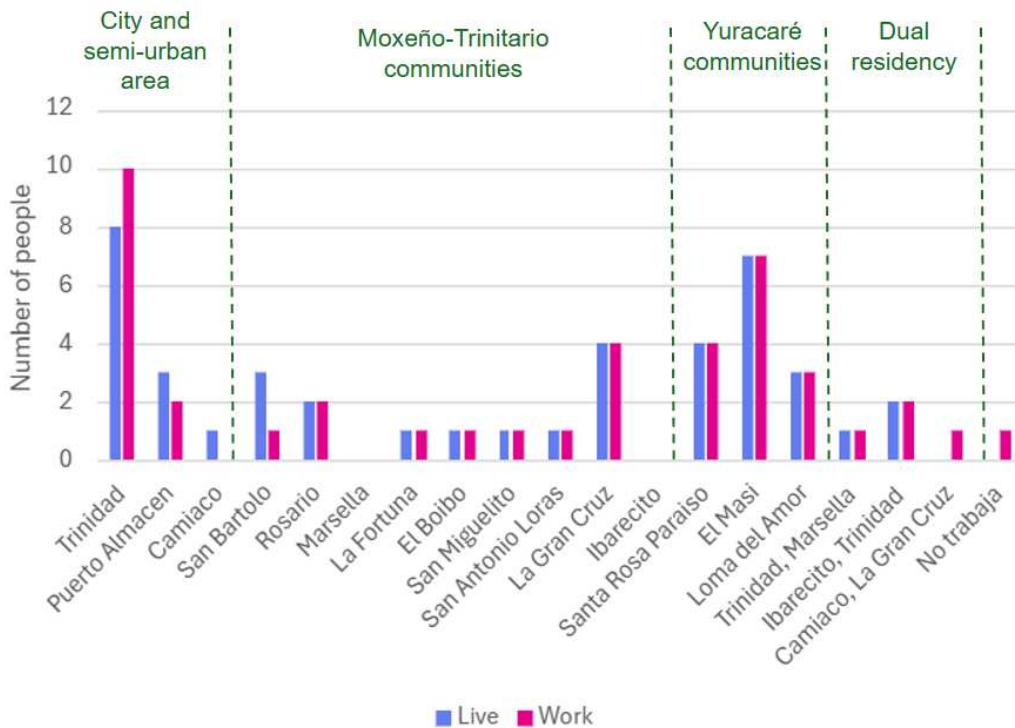
***Moxeño-Trinitarios routes of mobility***

**Figure 10.** Moxeño-Trinitario and Yuracaré peoples' patterns of movement

**Source:** Elaborated by the author based on interviews' data

Although most of the interviewees live and work in the same place, there are some exceptions. For example, in the cases of San Bartolo and Puerto Almacen, more people reported to live in those places than the number of people who work there; in the case of Trinidad, more people work there than those who live there. San Bartolo is the closest community to Trinidad, and Puerto Almacen is a neighboring town of that urban area. Thus, this result brings hints of the important function of “offering jobs and/or products commercialization” that an urban area such as Trinidad provides to Indigenous Peoples,

while they prefer to live in more rural places where the living costs are lower and where they have access to land and natural resources. For example, a community member from Marsella currently lives and works in Trinidad in paid job at the university; however, he frequently visits the community to get fruits and farm crops, and he is planning to go back to his community after he retires. On the other hand, another community member from Marsella, who lives in Puerto Almacen and worked in Trinidad mentioned *“In Trinidad everything is money, we have to buy everything, in town we can make chicha and grow crops”*. Lastly, 3 people reported living and working both in the city of Trinidad and their communities, spending about half of the year in each place (see figure 11).



**Figure 11.** Places where people live and work.

**Source.** Elaborated based on interviews data.

Turning now to the functions attributed to the places people move from and to, those were described by interviewees based on questions about what they enjoy, get from, and dislike about the places they live or work in (Table 4). The most emphasized functions in the case of cities are related to paid employment, access to education, housing, food, opportunities to sell products, and access to health care. In the case of rural communities, they were identified as the places where crops and forest products are grown or extracted, and cities are the places where those are commercialized. Lastly and interestingly, family and support networks were mentioned as functions fulfilled by both the city and communities.

**Table 3.** Functions that the cities and rural communities fulfill identified from the interviews organized by frequency of mentions.

City's functions	Importance/frequency	Examples
Paid employment	21	"My children can continue studying to be professional and have a job" (Rosario community member)
Education	14	"I can work and study at the university at the same time" (San Bartolo community member) "My children study here to have a professional career" (Marsella community member)
Private house	12	"Because I had a parcel here to build my house I decided to stay" (Marcella community member)
Food supply	7	"We go to Trinidad to buy food that is not available in the community, for example oil, flour, sugar, salt, spices, and also gasoline, medicines, and laundry detergent" (Rosario community member)
Forest products Commercialization	6	"We produce wild cacao, banana, cassava, and sometimes I get wood to sell it in Trinidad" (Ibarecito community member)

Health care	5	"We usually go to Trinidad or Camiaco to buy medicines to take care of our health" (Loma del Amor community members)
Better life	3	"Life is better for elderly in the city, it is easier to maintain them, they do not need to work to get their food" (San Bartolo community member)
Family/support network	2	"We prefer Trinidad to bring our children instead of Camiaco, because we have family there, my sister has her family there and we can stay with her" (San Antonio de Loras community member)
Military service	1	"I came to Trinidad because I had to join the military service" (San Bartolo community member)
<b>Communities' functions</b>	<b>Importance/ frequency</b>	<b>Examples</b>
Self-produced food	17	"I get food from my parcels, I produce rice, maize, bananas, cassava, lemon, orange and others...I also fish and sometimes wood, but just little because it is difficult to transport to the city for selling it" (Marsella community member)
Natural resources	10	"Here we can fish and get wood" (Santa Rosa community member)
Family/support network	2	"My wife died 5 years ago, and I have 4 kids, so I came here because my sister and stepmother live here, and they help me to raise my children" (Santa Rosa del Paraiso community member) "After my husband died I came here because my father and brothers are here, my dad allowed me to stay here to raise my children with their support... because here at least we would have rice to eat" (La Gran Cruz community member)

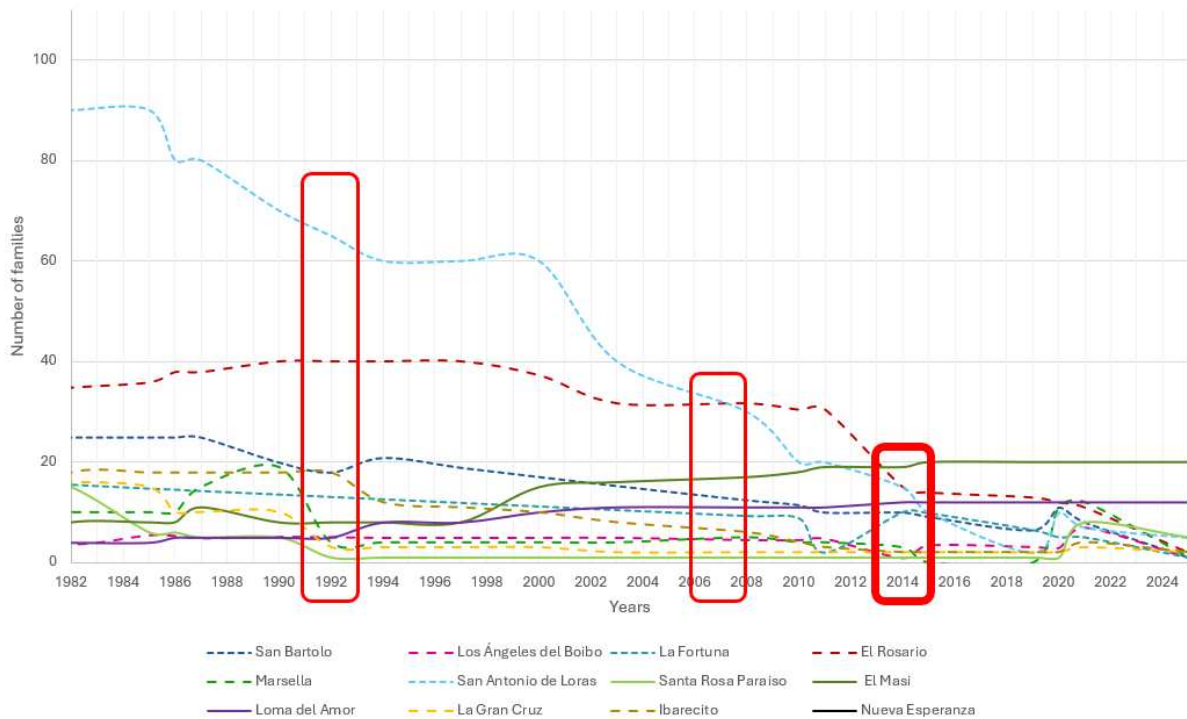
## 4.2. Drivers of Human Mobility

According to the communities' diagnosis and plans elaborated in 2021 by the GTLM, there are different causes of depopulation. Among the highest ranked are precarious housing and lack of basic services, lack of economic resources and employment, and floods, which cause economic losses (see Table 5).

**Table 4.** Drivers of mobility identified in the Communities' Plans ranked by the highest to the lowest frequency of mentions.

Drivers of depopulation
<p><b>Precarious housing and basic services:</b> Communities lack electricity, drinking water, sanitation, education, or medical care. Most communities currently do not have schools. Only one community has a high school. Due to the decreasing number of students, the few schools in the communities have been closing, as they fall below the minimum threshold established by the government to assign teachers. In the case of medical care, the few health posts lacked supplies or staff, so they were abandoned. On the other hand, in one community, it was mentioned that declining knowledge about the use of medicinal plants is forcing people to look for medical care in the city.</p>
<p><b>Lack of economic resources and employment:</b> Families engage in economic activities in their communities such as producing crops, fishing, and selling wood; however, these activities do not allow them to generate enough monetary income to cover needs like education, gasoline for transportation, medicines, among others. Due to the lack of sufficient monetary income within communities, residents move to more urbanized centers in search of paid jobs.</p>
<p><b>Floods:</b> The frequent occurrence of floods causes animals to be lost (cattle and wildlife). Floods also affect agricultural production, negatively impacting families' monetary and non-monetary income.</p>
<p><b>Lack of infrastructure, organization and disaster prevention:</b> Community infrastructure and organization is limited. Moreover, there is no prevention against floods, crop failure or losses of animals (domestic and wildlife).</p>
<p><b>Community abandonment:</b> There is a lack of support from the municipalities of Cercado and Loreto, and other public institutions.</p>
<p><b>Dual residence (City-community):</b> One community highlighted that members have dual residence in the community and the city.</p>
<p><b>Fire:</b> In one community fire was an issue, because they experienced an out-of-control fire after slash-and-burn.</p>

**Source:** Adapted from the Communities Diagnosis and Plans (2021-2026)



**Figure 12.** Changes in population over time and years with reported large floods

**Source.** Elaborated by the author based on data extracted from Communities' Diagnosis and Plans, and from interviews.

Figure 12 highlights 1992, 2007 and 2014 as the 3 years when the largest floods happened in the study area. According to the communities' plans, the flood that occurred in 2014 was the most devastating; it affected the whole region and every community of the SCIRRM, causing the loss of houses, crops, animals and communities' infrastructure. The floods that hit in 1992 and 2007 were also destructive and affected about 50% of the communities' territories, causing similar damages as in 2014, but to a lesser extent. It is important to highlight that this study took place right after a big flood, which negatively affected all communities, and in the middle of an economic national crisis, which affected hugely the transportation costs and therefore, all other living costs.

To triangulate the information about the drivers of mobility collected from the communities' plans, I included questions in the interviews about people's reasons to leave or stay in their communities. Most of the participants attributed the reason to leaving their communities firstly to the "precarious basic services", which include a lack of basic services such as schooling, health care; secondly to "precarious work conditions" in the field and not getting enough money to meet their needs; and third, to "floods" which keeps pushing people out of their communities more or less regularly (see Table 6). Interviewees also mentioned that living conditions in the city are preferred, that it is more feasible to get access to private property in the city, and that their families already live in the city. Interestingly, there are reasons related to owning land or a house, and family and support network for both reasons to leave and to stay (see Table 6). Additionally, the lack of schools is viewed as both the cause and effect of depopulation. For example, a community member from La Gran Cruz mentioned that:

*"Community members left because of the floods and more because of the lack of school, which only offered classes up to the fifth grade. When there was no need to study beyond the fifth grade, the communities survived. There were more families. Once the law required parents to send their children to school, they had to leave".*

**Table 5.** Drivers of mobility: reasons to leave and to stay in the communities found from the interviews organized by frequency of mentions.

	Categories	Frequency	Examples
	Precarious basic services	40	"Since 2010, I've been going to Trini regularly because school closed in 2009, and my daughters have to go to school. My son, had to repeat the same grade twice because there were no more classes [in our community]" (San Bartolo Community member)  "While there was a boarding school for my children, we still lived in La Cruz, but when it was gone, we

<b>Reasons to leave their communities</b>			had to look for a piece of land here, and that's how I ended up staying here" (La Gran Cruz Community member)
	Precarious work conditions in the communities	36	"People are getting used to not working on the land, but rather to being employed. They no longer work to harvest food because the jobs in the cities are easier, and they get paid (Marsella Community member)
	Floods	23	"In the 1980s, it started flooding, and people left" (Rosario community member) "People are leaving because of the floods, because they lose all their produce. Along with the floods, frost also arrives." (Rosario community member)
	Better living conditions outside their communities	13	"Now we have a house in Trinidad" (El Boibo community member)
	Tenure and natural resources conflicts	10	"Some people left because they had problems due to the fruit forest they were using, because those trees were not theirs, those were planted by the ancestors, so they belong to everyone's" (El Masi Community member)
	Family and support network	11	"My son works in Chapare harvesting coca with my brothers" (Santa Rosa del Paraiso community member)
	Fear of external/new people	1	"People left, but the same community members do not allow external people to come, they don't allow new people to farm because they fear the extraction of natural resources" (Marsella community member)

<b>Reasons to stay in their communities</b>	Habit/Sense of belonging	21	<p>“I don’t leave because my parents raised me up here, we are familiar and coexist with nature, we found out how to live better than in the city” (La Gran Cruz community member)</p> <p>“I came back because I fought strongly to achieve the community land legal status, that is why I want to maintain it, we invested so much to get it and thus, other rich people cannot take possession over our land” (Marsella community member)</p> <p>“I like living here, I like the countryside, weaving hammocks. We’re responsible for organizing the community festival.” (Rosario Community Member)</p>
	Labor conditions outside their communities	15	<p>“In Trini, we work daily. Here we can live better. We save more. We have animals, land to [produce food], and cows for emergency cash.” (San Antonio de Loras Community member)</p> <p>"I don't leave out of habit. I have several children. It's not worth it to be an employee with nine children. The salary isn't enough. The employers only give us about 350 dollars monthly. In the community, we can fish, harvest wood, grow bananas, yucca, and corn—everything to eat and sell." (Santa Rosa Paraiso Community member)</p>
	Tenure and natural resource access	11	<p>"We stay here because we have land, in Trinidad we can't have fish, nor cassava if we do not work to get money" (El Masi Community member)</p>
	Family and support network	7	<p>“But I stay here because I made my family here, our home, and we live well. The community members are good people. Only the current economic crisis makes me go out to look for food, supplies, clothes, shoes, etc.” (El Masi community member)</p>
	Living conditions outside their communities	2	<p>“I didn't have the opportunity to own land and build a house in Trini like my friends, but I still wouldn't have gone” (Rosario community member)</p>

Additionally, the community stories show that since the 90s', floods exacerbated the depopulation of Moxeño-Trinitario communities, while, interestingly, the Yuracaré communities have not decreased, on the contrary, they increased their population over time maintaining strong connections with places where they work in exchange of wages to support and diversify their families and communities' economies.

#### **4.3. Effects of Human Mobility**

The main effects of depopulation highlighted by the interviewees are “lack of capacity to control and monitor land grabbing and illegal extraction of natural resources”, and “precarious housing and basic services, including lack of schools”, followed by “community abandonment”, “lack of children to have schools”, and “dual residency” (table 7).

The most important effect cited in the communities' plans is “precarious housing and basic services”, which refers to the phenomenon of having less people, which at the same time results in the closing of schools and medical facilities, in houses and community infrastructure being abandoned, and in having less attention from authorities to get access or maintain water, electricity or transport systems. It is important here to note that “precarious housing and lack of basic services” were also identified, through communities' plans and interviews analysis in the section above, as the most important drivers of mobility (tables 5 and 6). This result stands out because precarious housing and lack of basic services are seen as both drivers and effects of people's mobility and depopulation of communities, describing a “vicious cycle” in which outmigration ends up leading to more outmigration via the erosion of services provision to community residents.

The second identified effect of outmigration arises from a concern of land grabbing and illegal extraction of natural resources by outsiders, and from the lack of capacity to guard their territories because there are not enough people living in the communities able to patrol and raise the alarm (Table 7). This was the most frequent concern expressed, which is related and exacerbated by the “lack of people and money for communal activities” (Table 8).

The effect of community abandonment arose in the communities’ plans in reference to lack of care by authorities due to having less people living in the communities, and to community members not going back after floods. Interestingly, this effect was not mentioned in the interviews. However, through the field visit, I observed expressions of this phenomenon in most of the Moxeño-Trinitario communities, as those suffered the most decrease in their populations (Figure 13); in contrast, the Yuracaré communities (Loma del Amor and El Masi) have well maintained education facilities, as well as their houses and community infrastructure such as churches or cabildos<sup>4</sup> (Figure 14). Additionally, interviewees from Yuracaré communities expressed no problems with depopulation, as their families increased over time since their creation as pointed out in section 1 of results.

Lastly, “dual residency” was reported in the communities’ plans to result from the mobility of people, as nowadays community members tend to live in both places, their

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<sup>4</sup> Cabildos refers to the infrastructure (usually an artisanal shelter with some tables and chairs) where community assemblies take place and are usually located in the middle of the settlement.

rural communities and the city, seasonally throughout the year. It is also reported that this dynamic is exacerbated by floods depending on their magnitude.

**Table 6.** Effects of depopulation identified in the Community Plans ranked by the highest to the lowest frequency of mentions.

Effects of depopulation
<p><b>Precarious housing and services/lack of medical care/lack of schools:</b> having less people and children result in the closure of schools and medical facilities, also, houses and community infrastructure are destroyed by lack of maintenance and occurrence of extreme weather events. Lastly, having less people decreases attention from authorities to maintain basic services or productive projects.</p>
<p><b>Lack of capacity to control and monitor land grabbing and illegal extraction of natural resources:</b> concern of land grabbing and illegal extraction of natural resources by outsiders, and from the lack of capacity to guard their territories because not enough people live in the communities</p>
<p><b>Community abandonment:</b> By authorities because there are less people to care for, and by community members who did not go back after the big floods.</p>
<p><b>Dual residency:</b> People live seasonally in rural communities as well as in urban areas</p>

**Source:** Adapted from the Communities Diagnosis and Plans (2021-2026)<sup>1</sup>



**Figure 13.** Abandoned houses and health post in El Boibo and San Antonio de Loras

**Source.** Taken by the author in August 2025



**Figure 14.** Views of Loma del Amor and El Masi

**Source.** Taken by the author in August 2025

In addition to the information in table 7, interviewees brought up, as effects of depopulation, the decrease of projects promoted by civil society and governments due to few people living in the Indigenous territories. Surprisingly, about 1/4 of participants who referred to such challenges mentioned they do not see any negative effect of depopulation to their daily life in the communities, moreover, they appreciate less conflicts, as the more people, the more conflicts may occur. However, some encountered visions came up, even from the same person, about the positive and negative effects of depopulation. For example, a community member from El Boibo argued *“Now I live alone and peacefully because there are no conflicts...but when there were more people, the community could be cleaned up. As an authority, I need more people to do things in the community like rebuilding the school”*; or a community member from Rosario expressed

*“I live peacefully with my sons, no people is not a problem, although I feel sad when there is silence”*. This argument brings up the tensions between why people and authorities may or may not be willing to address mobility and depopulation as a problem.

Lastly, interviewees also mentioned the loss of connection between their children, who are raised and educated in the city, and their community’s lifestyle. This factor, identified as a side effect, results in parents’ views, in an apathic attitude from youth towards their communities.

**Table 7.** Effects of depopulation identified from the interviews organized by frequency of mentions.

Effects of depopulation	Frequency	Example
Fear of land grabbing (by externals or the government)/ Illegal extraction of natural resources (fish, wood)	12	<p>“There is a fear of land grabbing despite it being entitled to us. Even the authorities told us that they will bring people because the land is empty...the sport fishers enter illegally to our rivers from ports in Trinidad...there are also furtive hunters” (Marsella community member)</p> <p>“Recently some people from the Chapare, who were sneaking around, wanted to take over a loma<sup>5</sup> because of the wood, they even sold the loma...thanks to our affiliation to the SCIRRM we were able to recover our land. Community members helped us take it back. We filed the problem to the agri-environmental court, but they never answered our demand” (La Gran Cruz community member)</p>
Lack of collaboration/ Not enough people nor money for community activities	7	<p>“There are few community members who are willing to collaborate and provide money for the activities...some only give psychological support, but no money” (Ibarecito community member)</p>

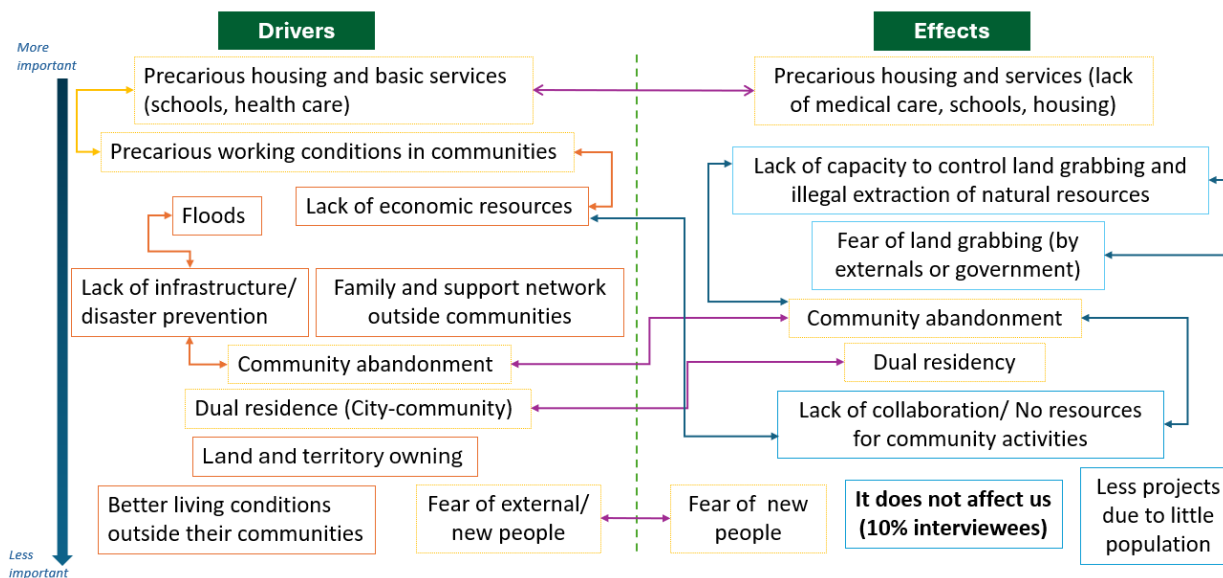
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<sup>5</sup> Lomas are the ancient structures build by Indigenous Peoples in the Llanos de Moxos to manage water and cope with floods impacts.

It does not affect us	5	“We don’t feel any change; we live the same as when there were more and fewer people” (La Gran Cruz community member)
Fear of external/new people	1	“People do not allow outsiders to come; they fear the extraction of natural resources and that they enter and take over the community” (Marsella community member)
Less projects promoted by civil society/government due to little population	1	“I had to bring my nephews to comply with the minimum number of families to get projects, there are no projects, no seeds, nothing, especially after the floods” (Santa Rosa community member)

**Source:** The author, based on interviews

It is important to point out here that the concern about land grabbing and illegal extractions of natural resources is a concern mainly expressed by the communities’ and Sub Central authorities, because they are usually the few people who live or spend more time in the communities.



**Figure 15.** Intertwined linkages among drivers and effects of human mobility in the SCIRRM

**Source:** The author

Lastly, it is worth highlighting that drivers and effects of human mobility are intertwined (Figure 15). Factors such as precarious housing and basic services (which include lack of education and healthcare), lack of economic resources, dual residency, and community abandonment, have been pointed out both as drivers and effects of mobility, in the communities' plans (Tables 5 and 7). In the specific case of education and precarious working conditions, especially for Moxeño-Trinitario community members, both can exacerbate each other, as children and youth are forced to leave their communities to continue studying, and when educated they tend to stay in the cities to further their studies while working, and to pursue a paid professional job afterwards. Community members from Rosario and Marsella, both Moxeño-Trinitario communities, stated that their *"children are studying to be professional and have a career."* In contrast, drivers such as floods, lack of infrastructure and disaster prevention, as well as community abandonment by their members and authorities, worsen each other, as the lack of the infrastructure and attention by authorities may result in a greater impact of floods. In turn, more harmful floods result in major damage to infrastructure causing further abandonment by residents. These are some examples of the intertwined and underlying drivers of human mobility and how they can amplify the problem of depopulation.

## 5. DISCUSSION AND RECOMMENDATIONS FOR FURTHER RESEARCH

### 5.1. Drivers and effects of rural-urban mobility: Intertwined linkages

The present study was designed to explore the drivers and effects of human mobility in the LdM. The results presented above suggest that precarious housing and basic services such as education and health care, along with precarious work conditions are recurrent driving forces for rural communities' abandonment as stated in the literature (Parry, Day, et al., 2010; Davis et al., 2017). These factors increase sedentarization of Indigenous Peoples in the LdM due to education and health care being assigned to districts fixed in space, and due to labor demand being linked to growing urbanized areas. Thus, interviewees pointed out that they or their children had to move to another community or urban area to continue secondary education, seek healthcare, or access paid jobs. Interestingly, precarious housing and basic services were also identified as effects of mobility, along with community abandonment, dual residency and fear of external people, these intertwined linkages add complexity to Indigenous mobility patterns.

The intertwined character of drivers and effects of mobility is not surprising in the context of the Amazon, as different urban and rural places fulfill distinct functions for people to reproduce their lives. As in the case of *quilombola*<sup>6</sup> communities in the Brazilian Amazon, where they move between urban and rural spaces to address economic challenges (Natusi et. al., 2015), the results of this study illustrate the presence of similar

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<sup>6</sup> “Quilombola people are descendants of the quilombo communities formed by runaway slaves (maroons) during the colonial era (1500–1822) and the monarchy (1822–1889)” (Natusi et. al., 2015).

patterns of mobility in Indigenous communities in LdM. The contrasting functions that urban and rural places fulfill for residents make them move temporarily, seasonally, or permanently.

Although availability of schools can help support rural communities in the short term (Davis et al., 2017), with these findings, I show that, in the case of Moxeño Trinitario communities, providing education to remote areas may not be enough to keep their communities populated or to repopulate them in the long term, because people perceive not having enough remunerated work opportunities within their rural territories. In contrast, in Yuracaré communities, youth tend to stay or go back to their territories after completing high school, or seasonal jobs, because most of the time, they do not pursue professional careers.

Nonetheless, mobility affects notably the ways in which communities respond to the socio-environmental challenges. This study shows tensions between positive and negative feelings about depopulation. Local experts have the idea that people who stay in communities are the ones who see depopulation as a problem. However, many interviewees, especially the elderly, who I found while visiting both Moxeño-Trinitario and Yuracaré communities, highlighted that having fewer people in their communities does not affect them negatively, or they even see it as positive because they have less conflict with other people, or they live more peacefully with only their closest relatives (parents and children, or couples). At the same time, they would like more people to live in the communities when the time to perform group activities, or to demand more attention from authorities or civil society comes. Thus, these tensions should be further discussed within

the communities' members, as people who stay in the communities should have a say on how to address the problem.

Lastly, floods are a major driver of mobility in the LdM and the communities of the SCIRRM, which are heavily affected by climate change (Angarita et al., forthcoming; Ronchail et al., 2005). Climate change affects Indigenous people's food security by degrading land and water-based livelihoods (Berman & Wang-Cendejas, 2024). Indigenous peoples in the LdM identified a severe reduction of aquatic and terrestrial plant and animal species, which they rely on for food, shelter, fuel, and economic exchange (SCIRRM, 2023), they also lose crops, which are used for self-consumption and to generate income, with every flood, which exacerbates human mobility and it is expected to worsen during the upcoming decades (FAO and UNU-EHS, 2025; Angarita et al., forthcoming). Additionally, climate change can be considered both a driver and an exacerbator of mobility (Boas, 2019). Even though mobility and migration are increasingly perceived as a compelling adaptation strategy for households to diversify income sources and increase resilience (FAO and UNU-EHS, 2025), results presented in this study suggest that mobility and migration can cause challenges for communities like the collapse of basic services, the weakening of natural resources' governance structures, and their ability to maintain their livelihoods. The connections between these ongoing dynamics should be further explored in connection with social, economic, cultural and political factors.

### **5.3. Ancestral relationships with territories influence movement patterns**

As stated in the theoretical background, human mobility is not unidirectional, nor monocausal, neither positive nor negative. The differentiated and multiple mobility patterns of Moxeño-Trinitario and Yuracaré peoples are to some extent linked to the relations they keep with their ancestral territories and their extended families. Moxeño-Trinitario people tend to move to mainly Trinidad, as well as other urban areas in the wider Beni and Santa Cruz departments, and to even to other countries to look for waged jobs in the labor market, and to a lesser extent to develop independent business to generate monetary income. It has been suggested that Moxeño-Trinitario people have a profound sentiment against selling their labor (Baudoin Farah, 2019). This does not appear to be the case for the Moxeño-Trinitario community members of the SCIRRM who participated in this study. Moreover, as discussed in the previous section, parents wish that their children will successfully integrate into professional labor markets after finishing their studies. Such tensions need to be further explored to understand the vision of the future of the Moxeño-Trinitario communities.

In contrast, Yuracaré people move mostly within their ancestral territory to work and generate income, mainly harvesting coca in the Chapare region; they also go to Trinidad to buy food and goods they need throughout the year. Coca plantations in the Chapare are seen as historically grown by intercultural (Indigenous quechuas, aymaras, campesinos, mining workers) settlers who moved from the highlands in the 80s (Grisaffi, 2025). This study highlights the importance of the coca economy for Yuracaré communities to maintain their livelihoods. This finding, echoes and complements previous

findings by Baudoin Farah (2019) in the region, which show nuanced relations between Indigenous peoples, the coca economy, and autonomy.

Participants in this study maintain differentiated relationships with their communities based on the evolving functions they fulfil for themselves and their families. This study supports previous claims by Berman & Wang-Cendejas (2024) about territories in the Amazon being dynamic in direct relation with peoples' mobility throughout time, and that increasing costs of life in rural areas are pushing Indigenous residents to pursue wage-based jobs despite the apparent plentiful access to natural resources in their territories.

#### **5.4. Implications for natural resources management and conservation**

Territory means the *“area of land where all inhabit and where we get the resources we need such as wood, fish, and animals”* (SCIRRM, 2022).

Despite Indigenous communities of the SCIRRM being located in a municipal protected area, the biggest concern of their members is the land grabbing and illegal extraction of resources by outsiders. The results confirm that illegal overexploitation of resources is common in areas with absence of people, as pointed out by Parry et al (2010a, 2010b), even within protected areas, especially in the Amazon (Nasuti et al., 2015). In the case of the LdM, there is a perceived threat of government intentions to promote new settlements with people moving from other regions of the country highlighting the pressures on natural resources in the communities of the SCIRRM and the Gran Moxos Municipal Protected Area, as well as the challenges that dwindling populations pose for territorial control and monitoring in the context of limited capacity by state actors to enforce conservation efforts.

The dialogues sustained with the SCIRRM' residents bring to light questions about the tensions surrounding conservation efforts and livelihoods in the context of limited economic opportunities: some participants of this study would have hoped to see more concrete benefits from the establishment of the protected area to their livelihoods and question the limitations they have to commercialize natural resources. These observations invite a deeper examination of the tensions between conservation efforts, the challenges posed to natural resource governance under climate change and increasing outmigration and dignified and sustainable livelihoods. It will also be important to further understand the relations that migrating families maintain with their communities in terms of access to natural resources and participation in governance structures.

While this study comprises the perspective of a significant number of current residents of the communities of the SCIRRM and some people who primarily live elsewhere, more perspectives of people who maintain different degrees of relations to their communities of origin are needed, as well as a more structured analysis of access to, use of, and perspectives on natural resources. Whilst this study was not framed or designed within the framework of human mobility theory and did not originally incorporate conservation concerns, it nevertheless aligned with the issue of *depopulation* experienced by members of the SCIRRM communities, situating the analysis within the scholarly realms on human mobility. It also partially substantiated concerns related to governance and conservation through its findings on the effects of mobility. However, the study's contributions to theory in these fields remain limited.

Further research may give attention to explore in more detail the extent to which climate change affects human mobility; the influence of conservation actions in

Indigenous mobility; differences in relating to place, territory and resources between Moxeño-Trinitario and Yuracaré communities; and the intertwined relationships between drivers and effects of both Indigenous groups' mobilities, giving attention to the economic relations they currently pursue. These aspects may support a better understanding of the implications of mobility for the governance of natural resources and preservation of communities and delineate realistic responses to the identified issue of *depopulation*. Lastly, further research may consider adjusting the framing of the problem and elaborate further research questions through a co-creation process with the Indigenous communities. This may provide a stronger grounding for the methodological design and methods to be followed in accordance with the practices and expectations of the communities involved.

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# APPENDIX 1

## Interview Guide

### Semi-structured interview

**Nombre:**

**Lugar:**

**Fecha:**

**Hora:**

#### **Preguntas guía (Autoridades de comunidades y expert@s del GTLLM):**

- Durante el diagnóstico de la Sub Central, se identificó como una de las preocupaciones principales la despoblación de sus comunidades. ¿Podría comentarme un poco más sobre esta preocupación?
- ¿Porque considera que la gente emigra? ¿A dónde mayoritariamente? ¿Puede contarme algunos ejemplos?
- ¿Es esta una problemática de todas las comunidades? ¿O de algunas? ¿De cuáles?
- ¿Quiénes migran en las comunidades (todos, hombres, mujeres, jóvenes, etc.)?
- ¿Se va la gente de forma permanente, o qué vínculos mantienen con sus comunidades?
- ¿Porque este tema es una prioridad? cuáles son los efectos negativos o positivos de la migración?
- ¿Como considera que el GTLM podría apoyar a las comunidades a enfrentar esta problemática? ¿Por qué?

#### **Preguntas guía (Comunari@s):**

##### **I. Sobre el estudio**

***Patrones de movilidad y características*** (RQ1. How are human mobility patterns of residents of Indigenous communities characterized?):

- ¿Puede contarme un poco de usted? dónde vive usted? ¿Por qué eligió esos lugares?
- ¿Desde cuándo vive en esos lugares? ¿O viaja a estos lugares?
- ¿Vive allí solo o con su familia? ¿Por qué?
- ¿Si son residencias temporales, cada cuanto se traslada?
- ¿Tiene planes de mudarse a otro lugar? ¿A dónde? ¿Cuándo?

**Razones de su movilidad** (RQ2. What are the direct and underlying drivers of mobility and what is the role of climate change among them?):

- ¿Cuáles son las razones por las que se mudó en el pasado y/o planea mudarse en el futuro?
- ¿Por qué decidió mudarse a estos lugares? ¿cómo escogió este lugar?
- Tiene familiares y/o amigos que hayan emigrado de su comunidad? ¿Puede contarme un poco?

**Relaciones con los territorios** (RQ3. What relationships do Indigenous People develop and maintain with the places they move to, from, and through?)

- Que es lo que mas valora del lugar donde vive?
- ¿Que es lo que valora de los lugares donde vive temporalmente? qué es lo que más o menos valora, más o menos le gusta?
- 

**Desafíos que la movilidad representa** (RQ4. What are the challenges posed by mobility to Indigenous communities, especially in terms of land and natural resources governance, and what climate adaptation strategies can be adopted to overcome them?)

- ¿Considera usted que la migración y despoblamiento son problemas para su comunidad? ¿Por qué?

## **II. Sobre el proceso de investigación:**

- ¿Ha participado en estudios de investigación? ¿Como se ha sentido? ¿Como se podría mejorar? o como le gustaría participar?
- ¿Considera que una investigación podría aportar a las comunidades a enfrentar esta problemática? ¿Por qué? ¿Como?
- ¿Cuáles considera que son las expectativas de las comunidades con respecto a una investigación?
- ¿Le gustaría o interesaría saber más sobre este tema? ¿Por qué?

## APPENDIX 2

### Photos



Initial Workshop with Communities members



Meetings to present the project and to recruit interviewees