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Spatial Mobility Patterns of the Population of Alalak District and Their Implications for the Concentration of Urban Activities in Banjarmasin City

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Abstract

Population growth is always accompanied by increasing demands for living and space for economic, social, and residential activities. Limited availability of space within the city creates alternatives to meet the need for residential space, which often involves taking up space in the suburbs. This phenomenon has given rise to population mobility patterns between suburban areas and the core city. This study aims to analyze population movement patterns in Alalak District, a suburb of Banjarmasin, and to analyze the reasons driving population movement towards Banjarmasin, as well as its relationship to the concentration of activities in Banjarmasin. The study was conducted in Alalak District, Barito Kuala Regency, using a descriptive quantitative approach. The study area was divided into three zones based on distance from Banjarmasin city: Zone 1 (less than 10 km), Zone 2 (10-20 km), and Zone 3 (20-30 km). Data collection was conducted through structured interviews with 150 respondents selected proportionally from each zone. The data obtained were analyzed to identify mobility patterns and factors driving population movement. The results of the study indicate that most of the activities of the residents of Alalak District, especially work activities, university, and purchases of annual necessities and high-value goods, tend to be oriented towards Banjarmasin City. This movement pattern is influenced by the quality and completeness of service facilities in Banjarmasin City, the availability of trade and service centers, and the relatively good level of transportation accessibility. The intensity of population mobility from the suburbs to the core city contributes to the increasing concentration of economic and social activities in Banjarmasin City. These findings indicate that spatial interactions between suburban areas and the core city play a significant role in shaping the spatial structure and dynamics of urban activity in the Banjarmasin area.

Keywords: Population Mobility; Spatial Interaction; Urban

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1. Introduction

Population growth in urban areas is accompanied by an increase in the need for urban space (Faizah & Hendarto, 2013). Banjarmasin City's population is projected to be the largest in South Kalimantan by 2025, with the majority of residents in the productive age group (aged 15-59 years), accounting for approximately 66.92% of the total population (BPS, 2026). This reflects the potential for high daily mobility for work, education, and other services. A dense, integrated, and highly connected city will influence population mobility, including transportation mode selection and travel intensity(Galih et al., 2025). Conversely, population mobility also contributes to the formation of activity concentrations in certain areas, such as economic, trade, and service centers.

The density of a city's network is inseparable from the activities of the people within it (Mahalina et al., 2016). Population activity behaviour is related to the frequency, duration and variety of trips which include work, school, daily and non-daily shopping activities. (Maat & Theo, 2002). Different movement motivations in people living in the hinterland of the city with their respective specifications and purposes will form their own patterns (Iswahyudi et al., 2018). One of the reasons for population movement is economic, namely to get better jobs and employment opportunities (Short, 1984). The most dominant pattern of people's movement in the city is to work in several government offices that are centralized in the city (Anusanto, 2012). Women's travel patterns are generally more varied (work, shopping, dropping off/picking up children, and other activities such as sports and personal matters). Women's trips are also shorter due to the proximity of their destinations (markets, children's schools) (Pontoh & Maryati, 2003). Women who spend more money in the city than in the local area where their housing is located are influenced by factors such as education, income, expenses, location of children's schools, and location of work. (Muta'ali, 2005). Research on urban mobility in Indonesia shows that digital transformation and smart city systems have changed people's movement patterns, both in terms of frequency, purpose and intensity of mobility (Tung et al., 2024). This indicates that mobility is not only physical but also linked to socioeconomic and technological dynamics.

Studies on population mobility in Banjarmasin and its surrounding areas show that previous research remains fragmented across several main focuses. Research by Alamin et al. emphasized that the mobility of residents commuting to Banjarmasin City is driven by limited employment opportunities, limited educational facilities, and improved transportation access. Population mobility is influenced by pull factors, including economic opportunities, a variety of city facilities, and more competitive prices for goods and services (Alamin et al., 2015). Mobility in the Banjarmasin area has developed into an inter-regional commuter system (Banjarbakula) related to the location of residence, work and school which has an impact on the dynamics of the urban area (BPS, 2024). A spatial study by Syafitri et al. found that the spatial pattern of settlements on the banks of the Martapura River includes linear river patterns and random patterns and spatial dynamics that occur based on environmental conditions (Syafitri et al., 2024). This research discusses static spatial structures and has not integrated the dynamics of population mobility as a spatial shaper.

The results of the synthesis of previous publications reveal several conceptual gaps. Previous research has separated mobility studies from urban spatial studies. Previous research has not examined mobility as a process that shapes urban spatial structure. No previous research has specifically examined Alalak District as a strategic peri-urban area, a transitional area between villages and cities, and a major source of commuter traffic to Banjarmasin. The peri-urban area serves as a buffer zone (hinterland), a labour provider, and a place for commuters to live. Research in the peri-urban area indicates that most population movements are routine (commuting) to the city centre for work, education, and other economic activities (Andani & Vinishaumi, 2024). Previous research has only identified mobility factors, without analyzing spatial patterns

(direction, intensity, network), origin-destination structures, and activity distribution based on mobility. Therefore, previous research has not addressed how mobility shapes activity centres, economic concentrations, and spatial structures. Based on this gap, this study fills the gap in studies that have not integrated the analysis of spatial mobility patterns of the population at the local scale (Alalak District) with their implications for the concentration of urban activities in Banjarmasin City, through a spatial geography approach that combines the dimensions of mobility, spatial structure, and regional interactions.

The movement of suburban residents towards Banjarmasin is partly due to the concentration of several activities such as working, shopping and schooling in Banjarmasin City. This population movement raises the problem of road congestion and dense use of space in Banjarmasin City caused by the concentration of these activities. Proving the tendency of suburban residents to move to Banjarmasin City, it is necessary to conduct research as evidence related to: 1) How is the spatial behaviour of residents of Alalak District as a suburb of Banjarmasin City in carrying out their activities (These activities are limited to work, shopping and school activities), 2) what reasons encourage the activities of residents of Alalak District to be carried out in Banjarmasin City, 3) How is the implementation of population movement towards the concentration of activities in Banjarmasin City. The purpose of this study is to analyze the movement patterns of residents of the suburbs of Banjarmasin City, to find out the reasons that encourage the movement patterns of residents of the suburbs to Banjarmasin City, and the implementation of the movement of residents of the suburbs to the concentration of activities in Banjarmasin City.

Spatial mobility refers to the movement of individuals or groups of people within a geographic space, both between daily locations (such as from home to work/school) and between broader regions. This movement is influenced by social and economic structures, transportation policies, the use of space, and urban characteristics within a region. Mobility is not merely physical movement but also reflects the interaction between people and space, influenced by the socioeconomic context and urban structure (Recchi & Flipo, 2019). Spatial Interaction Theory states that human mobility occurs as a result of interactions between two locations based on the relative population size or activity in the origin and destination cities, distance decay (the further the distance, the smaller the interaction) and the level of connectivity (transportation, cost, time/distance) (Wegener, 2010).

Spatial mobility is structured by socioeconomic needs and spatial form/use. The more diverse the land uses in a city, the more complex and dispersed the mobility route patterns (Lee & Holme, 2015). Spatial interaction is not only actual movement, but also represents the spatial relationship between spatial activity and human mobility. This interaction is influenced by three main components: complementarity, transferability, and intervening opportunity. Complementarity depends on the supply-demand relationship between the origin and destination space. Transferability refers to the ease of movement based on cost, time, and infrastructure. Intervening opportunity refers to opportunities that arise in other locations that can replace or reduce mobility costs (Somantri, 2013). These three components form a logical foundation for understanding mobility patterns within cities, between cities, and across regions.

2. Method

This research employs quantitative descriptive analysis. It examines the spatial movement patterns of suburban residents (Alalak District), the reasons driving these movements, and analyzed their implementation in relation to the concentration of activities in Banjarmasin City. The research was conducted on the outskirts of Banjarmasin, with the research area being Alalak District, Barito Kuala Regency. Alalak District is a suburban area directly adjacent to Banjarmasin City.

Data were collected through a questionnaire with 150 respondents. The sample size in this study

refers to the opinion of Sathyanarayana who stated that for general surveys, the recommended sample size is between 100-200 respondents to ensure representativeness and statistical power (Sathyanarayana et al., 2024). Therefore, 150 respondents are in the middle of the ideal range and are considered sufficient to describe population mobility patterns representatively. Another consideration in determining the sample is relevance to the nature of the study. This study has a quantitative descriptive-explanatory character, based on a daily mobility survey (commuting), with spatial analysis. This context does not require a very large sample, but it does require sufficient respondent variation and spatial distribution. Therefore, a spatially dispersed sample of 150 respondents is more valuable than a large but concentrated sample. Respondents included residents residing in the study area, without distinguishing between natives and immigrants. The data collected included data on the work activities of husbands and wives, shopping activities, and children's school/college activities.

The research sample area is divided into three distance zones calculated from the center of Banjarmasin: < 10 km, 10-20 km zone, and > 20 km zone. Distance determination is based on an isochrone map. The location of settlements in Alalak District is spread along the Trans Kalimantan highway and surrounding small roads. Planned settlements are starting to be built in the Alalak District area by developers. This development requires attention so that land use can be optimized while still paying attention to environmental carrying capacity. Data were collected through a questionnaire with 150 respondents. Each zone was selected using a simple random sampling of 50 respondents. Respondents included residents who reside in Alalak District, regardless of whether they are native residents or immigrants.

The Activity System Approach was chosen as an effort to understand behavioral patterns both individually and non-individually (institutions, groups, firms) that can result in the creation of spatial patterns in the city. The spatial patterns that occur are formed by various activities carried out by residents (Rachmawati & Kurniawan, 2006). This study measures three variables, namely: Variables of spatial movement patterns of residents related to work activities are measured from the work activities of residents in the research area along with the reasons for these movements. Variables of spatial movement patterns of residents related to shopping activities are measured from shopping activities carried out, including: daily, monthly, annual and luxury goods shopping along with the reasons for carrying out these activities. Variables of spatial movement patterns of residents related to school activities are measured from spatial behavior patterns of residents in the suburbs related to school activities starting from kindergarten, elementary school, junior high school, high school and college along with the reasons for carrying out these activities. The analysis carried out in this study aims to achieve several research targets in accordance with the stated research objectives, so that the research results can be used as considerations in transportation management and area development.

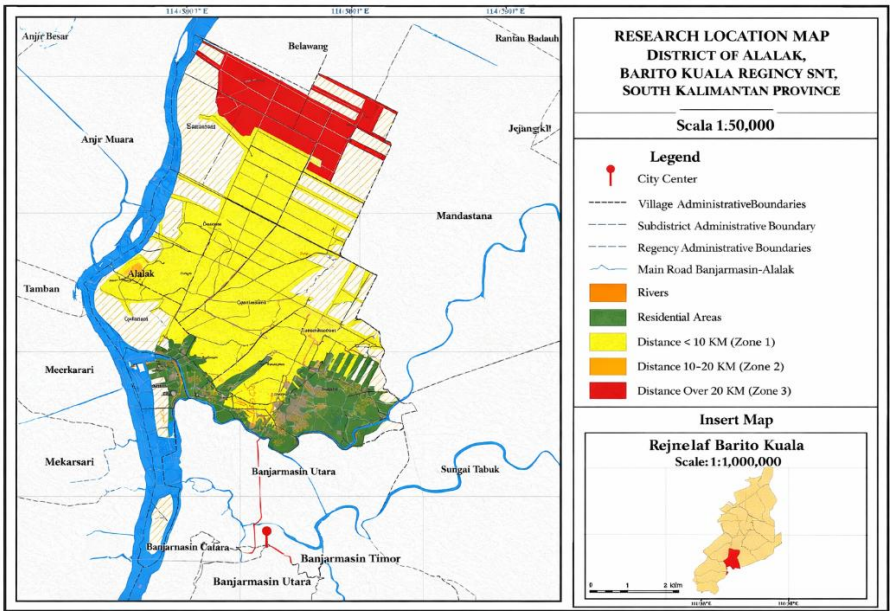


Figure 1. Sample Zones of Research Locations

3. Result and Discussion

A. Population Movement Patterns for Work Activities

Population movement behavior patterns in the suburbs related to work activities indicate that the part of residents in the study area work in Banjarmasin City (38%). The proportion of men (husbands) working in Banjarmasin City is greater than the proportion of women (wives).

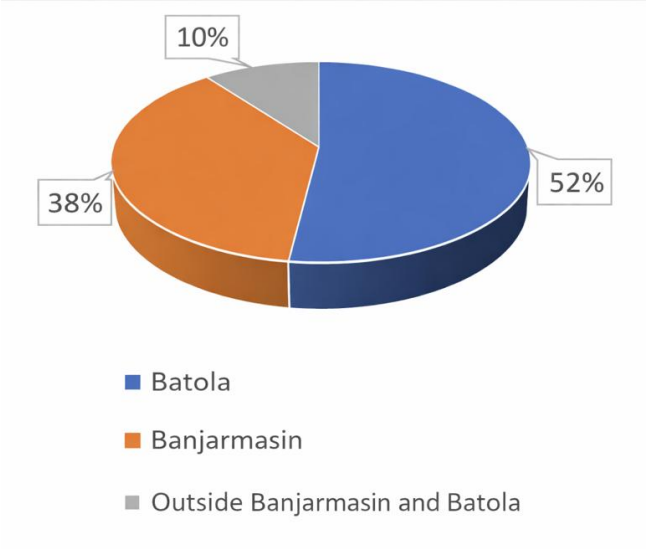


Figure 2. Distribution of Respondents' Work Locations

The findings based on Figure 2 show that the majority of the population of Alalak District works in Barito Kuala Regency (52%), indicating that the spatial mobility pattern in this region is not entirely a classic suburban-commuter pattern strongly oriented towards the core city (Banjarmasin). The resulting mobility pattern more reflects a hybrid mobility pattern between local and commuter residents.

The high proportion of the working population in Barito Kuala Regency indicates that the local

economic structure in the Alalak region and its surroundings is still capable of absorbing a significant workforce. The workforce absorbed in local economic activities includes activities such as the informal sector, local trade, agriculture, and small-scale services, which remain the primary source of employment for the population. Population mobility is a key mechanism in shaping urban spatial structure, with labour movement typically directed toward the city centre as the centre of economic activity. However, recent studies have shown that the attractiveness of the city centre is not absolute and tends to experience certain limitations. This condition allows for the development of more complex and less centralized mobility patterns (Dong et al., 2022).This is in line with the findings of this study, which found that the majority of residents work within the same administrative area (Barito Kuala), rather than in the core city of Banjarmasin. This phenomenon also reflects the characteristics of peri-urban areas, where there is a mix of rural and urban functions and the development of local economic activities that can absorb a significant workforce. Studies on peri-urban mobility in Indonesia show that socioeconomic factors, accessibility, and travel time efficiency are the main determinants of residents' choice of work location (Andani & Vinishaumi, 2024;Bindar et al., 2025). The dominance of jobs in Barito Kuala can be explained by spatial proximity, lower transportation costs, and the availability of relatively adequate local job opportunities.

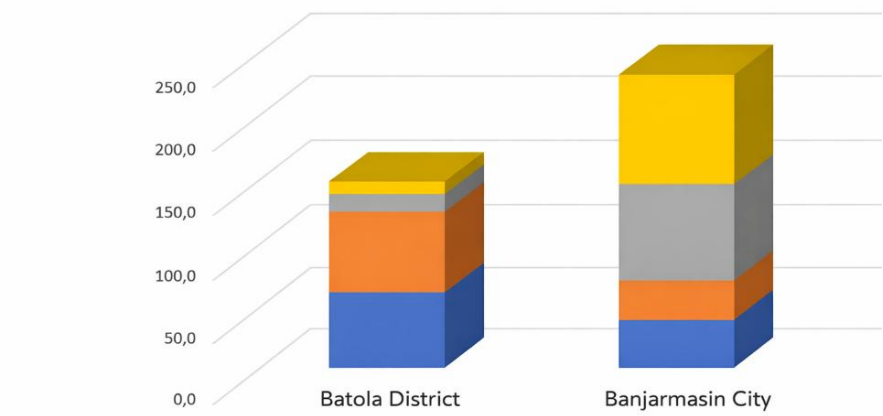
Banjarmasin City's role as a centre of urban activity remains evident in the proportion of 38% of the population working in the city. This indicates that Banjarmasin still functions as an urban core that provides formal employment opportunities, the service sector, and complete urban facilities. This attraction is selective and does not reach all levels of society, resulting in differentiated mobility patterns based on the socio-economic characteristics of the population. The context of this research places Alalak as a transitional area (peri-urban interface) that plays a dual role, namely as a residential area and a local economic production space. The mobility of Alalak residents not only contributes to the concentration of activity in Banjarmasin City but also reflects the process of decentralization of economic activity at the regional level. The reasons residents work in Banjarmasin City include work assignments, suitability of work location, and family relationships. Farmers tend to be tied to their work locations in the area around their homes. The choice of work locations close to their homes (in Alalak District) is primarily made by women who are wives, not only farmers but also traders and entrepreneurs. The reasons they work in close locations, even some of which are integrated with their homes, include working while caring for children or filling their free time. The difference in work locations between husbands and wives is consistent with the results of Rachmawati & Kurniawan (2006) research. This is also consistent with Pontoh & Maryati (2003)findings that women's travel patterns for both work and shopping are generally local, with shorter journey lengths than men's because their destinations are closer.

B. Population Movement Patterns for Shopping Activities

Shopping activities in this study consist of daily, monthly, annual, and luxury goods shopping. The results of the study indicate that there are differences in spatial movement patterns between daily, monthly, annual, and luxury goods shopping. The movement patterns of residents of Alalak District in daily shopping activities show that the majority of residents (62.7%) shop in Batola Regency, especially in Alalak District. Residents shop at traditional markets and roadside grocery stores. Residents who carry out daily shopping activities in Banjarmasin City (37.3%) are generally those who live around the Banjarmasin-Batola border so that the distance to Banjarmasin is close. Some of them shop in Banjarmasin City because they also work and they usually already have a regular shopping place.

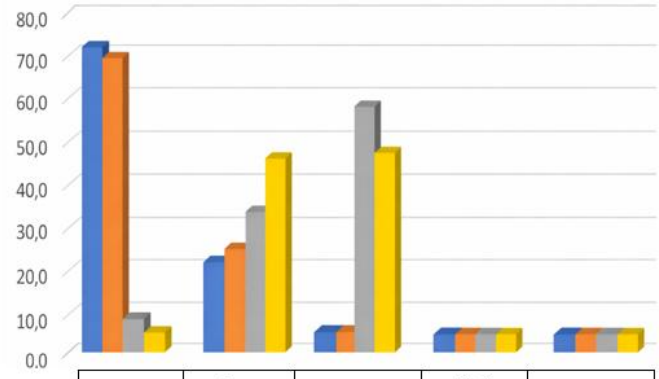
The majority of respondents (70%) shop in Batola Regency to meet their monthly needs. Thirty percent of residents shop in Banjarmasin City, primarily because of the greater variety of products

and relatively lower prices. They typically do their monthly shopping on their way home from work.



	Batola District	Banjarmasin City
Daily Spending	62,7	37,3
Monthly Spending	70,0	30,0
Yearly Spending	14,7	85,3
Luxury Goods Spending	10,0	90,0

Figure 3. Shopping Locations of Alalak Residents



	Nearby	Item Variety	Cheap	While Work	Refreshing
Daily Spending	72,6	18,7	4,7	2,7	1,3
Monthly Spending	70	21,3	4,7	2,7	1,3
Yearly Spending	8	30,7	57,3	2,7	1,3
Luxury Goods spending	4,6	44,7	46,7	2,7	1,3

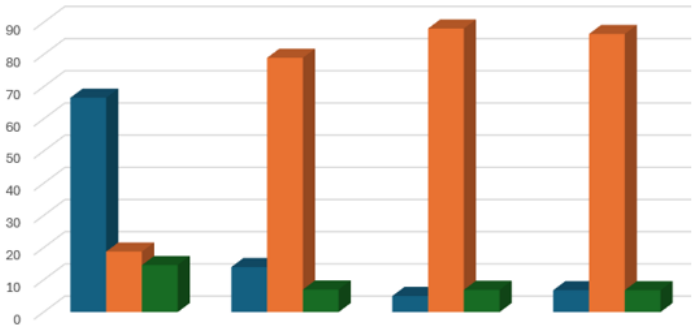
Figure 4. Reasons for Choosing a Shopping Location

C. Population Movement Patterns in School/College Activities

The spatial mobility patterns of residents of Alalak District based on education level show significant differences. At the tertiary level, the majority of residents move to Banjarmasin City (66.6%), while at the secondary and primary education levels (SMA < SMP < SD) mobility is dominated by activities in Barito Kuala (79%, 88.1%, 86.4%, respectively). These findings indicate that education level is a determinant in determining the direction of spatial mobility of residents, especially in the context of the interaction between suburban areas and the core city.

The dominance of mobility to Banjarmasin among the highly educated indicates that the core city serves as a center for further education and the modern economy. Universities are generally concentrated in urban areas, encouraging outward mobility from the suburbs to the city. This situation has implications for Banjarmasin as a magnet for educational mobility, resulting in a concentration of knowledge-based activities in Banjarmasin, the core city.

For those with high school and elementary school education, the majority of activities take place in Barito Kuala Regency. The results of the study indicate that mobility in secondary and primary education activities is short-distance. The spatial mobility patterns of residents of Alalak District related to school activities are also influenced by policies in the new student admission system through the school zoning system. The school zoning system is a new student admission policy that prioritizes prospective students based on the distance of their closest residence (domicile) to the school. This school zoning system applies to public schools. This condition has implications for spatial differentiation based on education. These differences in mobility patterns indicate the existence of socio-spatial segmentation, namely: the highly educated group carries out mobility towards the city (urban-oriented mobility) and the low-educated group carries out local mobility (local-oriented mobility). This phenomenon shows that mobility is not homogeneous, but is influenced by the social structure of society. The spatial mobility that occurs is a reflection of unequal access to urban resources, but cities do not attract all groups equally.



	Higher Education	High School	Junior High School	Elementary School
Banjarmasin	66,6	14	5	6,8
Barito Kuala	18,8	79	88,1	86,4
Others	14,6	7	6,9	6,8

Figure 5. Population Mobility Patterns in Education

The spatial mobility patterns of the population of Alalak District are formed through a complex interaction between social structure (education), economic structure (occupation), and spatial structure (city-suburb). The dominance of occupations in Barito Kuala Regency (52%), combined with the mobility tendencies of the highly educated (66.6%), indicates that the mobility that occurs no longer follows the classic distance-based pattern. The mobility that occurs reflects the differentiation of mobility based on socio-economic capacity (Socio-spatial differentiation of mobility).

Urban mobility in modern literature is understood as a direct reflection of a city's spatial structure and the distribution of economic activity. Empirical studies show that commuting patterns are largely determined by land use configuration and the location of activity centers, where travel flows follow the distribution of job opportunities and facilities (Acheampong, 2020). Thus, the dominance of local mobility in Barito Kuala Regency indicates that this region is not simply a

"residential suburb," but has its own distinct economic activity nodes. Furthermore, research by Zhao et al. (2024)shows that in cities with a less monocentric structure, the distribution of job opportunities tends to be more dispersed, resulting in a mobility pattern that is not singularly centralized. This is consistent with conditions in Alalak District, where the majority of residents do not commute to the city center (Banjarmasin).

The development of mid-sized cities currently shows a tendency toward a polycentric structure, namely the distribution of activities across several centers (sub-centers). A polycentric structure can reduce commuting distances, increase mobility efficiency, and create a balanced distribution of activities (Li et al., 2018). In the context of Banjarmasin as a mid-sized city, this structure is not yet fully mature. Banjarmasin is in a transitional phase (emergent polycentricity). This is demonstrated by Banjarmasin's continued strong role as a center for higher education and formal employment, while local activity centers have emerged in Barito Kuala Regency. This phenomenon is further reinforced by a recent study showing that mid-sized cities often experience a "proximity paradox," where geographic proximity to the city center is not always accompanied by high mobility to the city center due to social, economic, and local preferences (Cáceres-Merino et al., 2025).

D. Concentration of Spatial Utilization in Banjarmasin City as an Implication of Population Movement

Cities play a role as providers of facilities and services, as stated by Freeman. Meanwhile, the suburbs (the peri-urban region) are the areas surrounding the city, indicated by the presence of daily commuters heading to the city center (McGee 1991 in Rachmawati & Kurniawan, 2006)). The close proximity between the city and the suburbs allows for the movement of residents from the suburbs to the city to take advantage of existing facilities in the city, including: shopping centers with better facilities and quality goods, school facilities that are considered to be of better quality, and greater job opportunities in the city.

The tendency for population movement from Alalak District to Banjarmasin City can be minimized if the district and its surrounding areas have facilities that stimulate activity and serve as destinations. Population movement to the city can be minimized if good-quality educational and shopping services are available, thus creating new job opportunities in the suburbs.

One of the contributions of this research is that it demonstrates that education is a key variable in determining the direction of mobility. Highly educated groups tend to have access to formal employment, are able to cover mobility costs, and are connected to the city's economic networks. Conversely, low-educated groups are more dependent on the local economy, have limited mobility, and tend to choose jobs located close to them. From the perspective of contemporary mobility theory, this suggests selective mobility, where not all individuals have the same capacity to participate in the urban mobility system. Recent studies have also shown that mobility is influenced not only by spatial factors but also by individual characteristics such as education, income, and type of employment (Tung et al., 2024).

The integration of employment and education variables in this study leads to the understanding that population mobility in Alalak District is multidirectional (not one-way to the city) and fragmented (socioeconomically segmented). This aligns with the latest mobility theory, which suggests that in modern urban systems, mobility is no longer radial (periphery to core) but has evolved into a complex network between regions (networked mobility system). Recent studies have shown that technological developments and changes in work patterns (e.g., flexible and local work) increasingly strengthen local mobility compared to long-distance commuting (Krasilnikova, 2024).

The findings of this study provide an important reinterpretation of the concept of urban activity

concentration. Cities are classically viewed as primary centers of concentration (urban concentration), but the results of this study indicate that the concentration of activity in Banjarmasin City is selective (only certain groups), partial (not comprehensive), and segmented (based on education and employment). Meanwhile, the Alalak District area demonstrates characteristics as a local production space, a secondary activity center, and a buffer as well as a regional economic actor. Thus, urban activity concentration can no longer be understood as a process of complete centralization, but as the result of dynamic interactions between the center and the periphery in an increasingly distributed spatial system.

The spatial mobility of residents of Alalak District cannot be explained solely through distance or accessibility, but must be understood as the result of the interaction between spatial structure (city-suburb), economic structure (job distribution), and social structure (education level). This condition results in a mobility pattern that is non-linear, non-homogeneous, and not completely centralized. Banjarmasin City functions as a strong center of activity, but is not absolutely dominant in the regional mobility system.

4. Conclusion

The Banjarmasin-Alalak urban system is not entirely monocentric, but tends towards a semi-polycentric structure in which Banjarmasin, as the core city, remains dominant in certain sectors, and Alalak District, as a peripheral area, maintains an independent economic role. The concentration of activity in Banjarmasin City is selective and partial. Higher education and formal employment activities are concentrated in Banjarmasin City. Locally-based economic activities continue to thrive in the peripheral areas. Thus, the concentration of urban activity is not absolute, but rather segmented based on education level and activity. Banjarmasin functions as a magnet for skilled labor mobility. Some Alalak residents work in Banjarmasin City. Alalak residents who work in Banjarmasin are generally men as husbands, and women with higher education backgrounds who work in the formal sector. Meanwhile, women with lower education as wives tend to work in the informal sector close to home. Annual shopping activities and luxury goods are carried out in Banjarmasin City as a centre of modern economic services. This research contributes to the study of spatial mobility, showing that mobility is not only influenced by distance and accessibility; education is a key variable in shaping the direction of mobility. Highly educated groups tend to be integrated into Banjarmasin's urban economic system. Low-educated groups are more tied to local economic structures. This results in a selective and heterogeneous pattern of urban activity concentration.

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