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Dominant Forms of Livelihood Adaptation and Key Constraints in Mantuil Village, Banjarmasin City

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ABSTRACT: Livelihood analysis involves perceptions and complexities, as it encompasses a bottom-up approach and is context-dependent, focusing on individuals, households, communities, and social groups. Furthermore, livelihood adaptation is crucial to cope with various risks and shocks, which pose a greater threat for vulnerable residents living in a slum area. This analysis attempts to understand the forms of livelihood adaptation and constraints within the area. This understanding also contributes to a valuable discussion on livelihood and better interventions. The Garrett's ranking is employed to identify and analyze these forms and constraints. The dominant adaptation forms involve job seeking, land and tools utilization, counting on family support, and increasing societal concern for others. The key constraints comprise limited job opportunities, inequality, damaged infrastructure, inappropriate social assistance, and uncertain natural disruption. Both adaptation forms and constraints are interconnected, and resolving constraints is needed to facilitate effective adaptation.

Keywords: Livelihood, Adaptation, Constraint, Slum, Garrett's Ranking.

***ABSTRAK**: Analisis mata pencaharian melibatkan persepsi, kompleksitas, konteks, dan pendekatan dari bawah ke atas. Analisis ini menekankan fokus terhadap individu, rumah tangga, komunitas, dan kelompok sosial. Selain itu, adaptasi mata pencaharian ini sangat penting untuk mengatasi berbagai risiko yang dapat memberikan dampak yang lebih buruk bagi penduduk rentan yang tinggal di kawasan kumuh. Analisis ini menemukan dan memahami beragam bentuk adaptasi mata pencaharian dan hambatan di kawasan tersebut. Pemahaman ini juga dapat berkontribusi pada diskusi mengenai mata pencaharian dan kebijakan yang diperlukan. Garrett's ranking digunakan untuk mengidentifikasi dan menganalisis bentuk adaptasi dan hambatannya. Bentuk adaptasi yang dominan seperti pencarian pekerjaan, pemanfaatan lahan dan alat, mengandalkan dukungan keluarga, dan meningkatkan kepedulian terhadap masyarakat sekitar. Sedangkan hambatan utama seperti keterbatasan peluang kerja, ketidaksetaraan, infrastruktur yang rusak, bantuan sosial yang tidak sesuai, dan ketidakpastian dari keadaan alam. Bentuk adaptasi dan hambatan ini saling terhubung, karena dengan mengatasi hambatan, adaptasi yang dilakukan menjadi lebih efektif.*

***Kata Kunci:** Mata Pencaharian, Adaptasi, Hambatan, Kawasan Kumuh, Garrett's Ranking.*

INTRODUCTION

The livelihood approach is still relevant to the present and so on because it modestly acknowledges the multidimensional nature of a problem (De Haan, 2012). Among the important elements bringing this livelihood approach and research forward are perceptions and complexity (Kaag et al., 2004). Both perception and complexity are very dynamic and useful. Perceptions derived from people as main actors who directly experience and face many situations and problems in real life (De Haan & Zoomers, 2005). While complexity brainstorms interesting ideas and views to continuously delve into and solve the problems (De Haan & Zoomers, 2006). The discourse on livelihood persists as long as people strive to overcome challenges and sustain their lives through various activities and processes (Hebinck & Bourdillon, 2001). However, this livelihood approach has its criticism, where it does not generate so-called generalization and trend that can be considered as key assumptions of a problem (De Haan, 2012). Each research area generates its own insight and outcome. Indeed, such criticism can be answered by scaling up research on livelihood from different areas or localities, but it will be difficult and costly (De Haan, 2012). Moreover, in practice, it is difficult for livelihood research to cover all necessary information. For instance, it might not include and inform about persistent structural constraints when researching people in poverty (Banks, 2016; Kaag et al., 2004).

The livelihood approach has core principles to be complied with, and this should be understood before delving further. Obviously, the term livelihood is the main observation. Livelihood can be defined as an activity that utilizes resources (material and non-material) and capabilities to make a living and improve quality of life (De Haan, 2012; Hebinck & Bourdillon, 2001; Murray, 2001). These resources comprise human capital, natural capital, physical capital, financial capital, and social capital. In a simpler explanation, the examples of these capitals can be identified respectively as knowledge and skill, land and water, tools and machinery, money, trust, and relationship (Banks, 2016; Hebinck & Bourdillon, 2001). Furthermore, the livelihood approach is a bottom-up approach that involves micro-level observation, focusing on individuals, households, communities, and social groups as the primary sources of information (Banks, 2016; Hebinck & Bourdillon, 2001).

As explained previously, livelihood discourse emphasizes people's participation and perception, including their activities (Yang et al., 2021). These activities consist of both strategies and adaptations people use to thrive in life, and both are heavily developed and shaped by people's perceptions of risk, disruption, and their surrounding condition (Rakodi & Lloyd-Jones, 2002). Some risk such as climate change, water scarcity, and even natural disasters require varied coping mechanism (Funk et al., 2020; Liwenga, 2008; McDowell & Hess, 2012; Musinguzi et al., 2016; Pagnani et al., 2021). While Rakodi & Lloyd-Jones (2002) illustrate these risks as livelihood pressure and can be categorized into natural, economic, social, and health pressure. Each pressure can determine adaptations and strategies employed, while also considering availability of five capitals (human, natural, physical, financial, and social capital) within each individual and household. For instance, a farmer with advanced machinery and tools (indicative of higher physical capital), has a better opportunity to increase production and address livelihood pressure. A farmer with lower physical capital might choose another action or strategy outside of agriculture and may also seek support from relatives.

Moreover, context is an essential component in the livelihood approach, encompassing the existing local physical and social conditions (Hebinck & Bourdillon, 2001; Purnomo et al., 2023). This research attempts to analyze the problem in a specific context, which is urban slum. Urban slum is overpopulated and deprived areas that are not ideal or conducive to living (Pandey et al., 2018). Poverty, insecurity, and vulnerability are commonly observed in slum areas, intensifying the existing and upcoming negative pressures within (Farrington et al., 2002; Pandey et al., 2018; Wood & Salway, 2000). Residents in these areas reside in inadequate housing and have limited access to essential

services (Soma et al., 2022). There will be no inclusive city and sustainable community without upgrading slum areas comprehensively (Wicaksono et al., 2023). Further, the conditions in slum areas also make it difficult for their residents to pursue suitable and ideal livelihoods (Ayeb-Karlsson et al., 2016; Chatterjee, 2010; Garrett, 2004; Gopal & Nagendra, 2014; Hossain, 2005; Saharan et al., 2018). In other words, residents' ability to cope and adapt is reduced and very limited (Pandey et al., 2018).

This research was conducted in Mantuil village, situated in the South Banjarmasin sub-district, known for being one of the less developed slum areas in Banjarmasin city, located far from the city center. The focus of the research was on Bromo Island (Pulau Bromo) within Mantuil village, which serves as a representative example of the original and traditional settlements of Banjarmasin city residents (Nugroho et al., 2020). The inhabitants of this area live in floating houses above the river, rely on river transportation, and engage in various activities centered around the river (Afdholy et al., 2019). As a result, this investigation offers valuable insights into the adaptive strategies employed by traditional and local communities for their livelihoods. Additionally, the research addresses certain gaps in the existing literature. Livelihood is a dynamic process and discourse that need constant observation, as the varied observations contribute valuable insight and develop a better-designed intervention (Davies & Bennett, 2007; Kura et al., 2017; Yang et al., 2021). Osbahr et al. (2010) also observe that each location has different and even specific nature of livelihood adaptation. These differences exist because each location and its population possess diverse livelihood capital (Abu-Salia et al., 2015). Moreover, conducting a study in a slum area becomes more significant when there is a direct analysis and engagement with the varied characteristics within it (Arabindoo, 2011). Thus, the main objective of this research is to address the problems and gaps outlined earlier, specifically by understanding livelihood adaptations and key constraints in a slum area. This understanding contributes to a valuable discussion on livelihood and can inform better policies and interventions. The ability to adapt is crucial for overcoming challenges and thriving in life.

METHODS

The research uses Garrett's ranking technique to analyze various forms and constraints in the context of livelihood adaptation (Garrett & Woodworth, 1966). This method explores these forms and constraints descriptively, including explaining the most implemented forms of adaptation or the dominant forms, and the most concerning constraints in livelihood adaptation or the key constraints. This provides additional insight into residents' dominant preferences and complaints that can be considered important to delve into and solve. These forms and constraints are outlined and explained within the five categories of livelihood capital: human capital, social capital, physical capital, financial capital, and natural capital.

The research takes place in an area with slum characteristics called Bromo Island, situated in Mantuil village, within the South Banjarmasin sub-district. Bromo Island is positioned along the Martapura and Barito Rivers. The research involved households residing in riverbank homes. Most of the inhabitants are middle-aged families, typically aged between 46 and 50 years. The community's education level is predominantly composed of individuals who have completed elementary school to junior high school or its equivalent. The sole means of road access to Bromo Island is the Bromo Island Pedestrian Bridge. This 100-meter-long bridge was inaugurated in 2021 with the aim of providing transportation convenience for Bromo Island's residents, who formerly lacked road access to reach the central area of Banjarmasin City, particularly the opposite side of the island. Residents of Bromo Island continue to face inadequate housing conditions, as evidenced by the insufficient availability of basic residential facilities and the prevalent damage to the small wooden bridges connecting houses in the surrounding area.

The research process involves several stages of data collection and analysis: 1) In-depth discussions; 2) Questionnaire interviews; 3) Descriptive analysis; 4) Utilization of Garrett's ranking technique. In-depth discussions with key informants and village members are crucial to gaining initial insights into the forms and constraints surrounding livelihood adaptation in Bromo Island. These insights inform the development of questionnaires for the next step, which involves interviewing 164 participants. The outcomes of these interviews reveal information related to the context of livelihood adaptation, including the validation of issues, available employment opportunities, and encountered challenges. Furthermore, Garrett's ranking technique is employed to identify the dominant forms of livelihood adaptation and key constraints. Based on Garrett & Woodworth (1966), the respondents' data were calculated as a factor of the percent position using the following equation:

$$\text{Percent position} = \frac{100\ (R_{ij} - 0.5)}{N_j}$$

Where R_{ij} = Rank given for i^{th} by j^{th} individual and N_j = Number of items ranked by j^{th} individual. The percent positions obtained from the results are converted into Garrett score using the Garrett's ranking conversion table. To calculate scores for each item, the Garrett score is multiplied by the frequencies corresponding to each rank. The total Garrett scores are obtained by summing up the scores for each ranked item, and the mean score is then used to determine the final rank for each adaptation form and constraint. The Garrett ranking converts preferences regarding adaptation forms and key constraints into numerical numbers or scores (Asegie et al., 2022). A higher preference or rank indicates a higher order of merit, reflecting higher scores. According to the conversion table, Garrett's score spans from 0 to 99, where 0 represents the lowest score or least preferred option. However, the focus in Garrett's score is on the relative differences between ranks or order of merit, validating the respondents' preferences.

RESULTS AND DISCUSSIONS

This study begins with an in-depth discussion with the community and key informants within Bromo Island, followed by questionnaire interviews. The initial questions asked attempt to validate the problem of livelihood in the area. The answers from these questions confirm the problem, as illustrated in Figure 1.

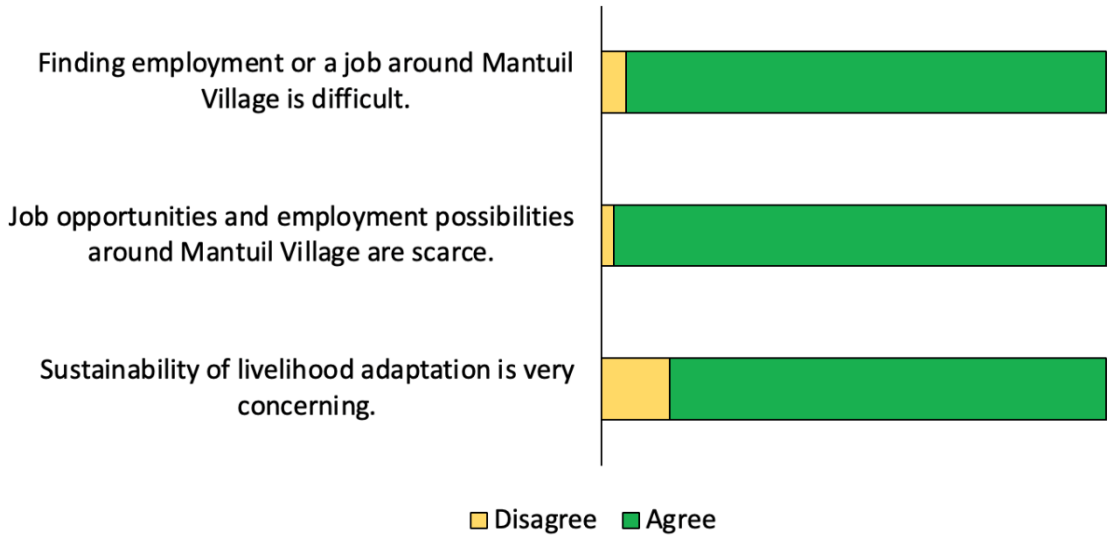


Figure 1. Initial observation on agreement regarding the issues (n = 164).
Source: Processed by author.

Figure 1 shows that most respondents in Mantuil village express agreement with the existence of these issues. Finding employment is challenging, and adapting livelihoods is also not an easy task. Respondents share information about common job options in Mantuil village and highlight factors that hinder job opportunities. Figure 2 and Figure 3 below illustrate the percentage frequencies of these job options and factors in respondents' perceptions.

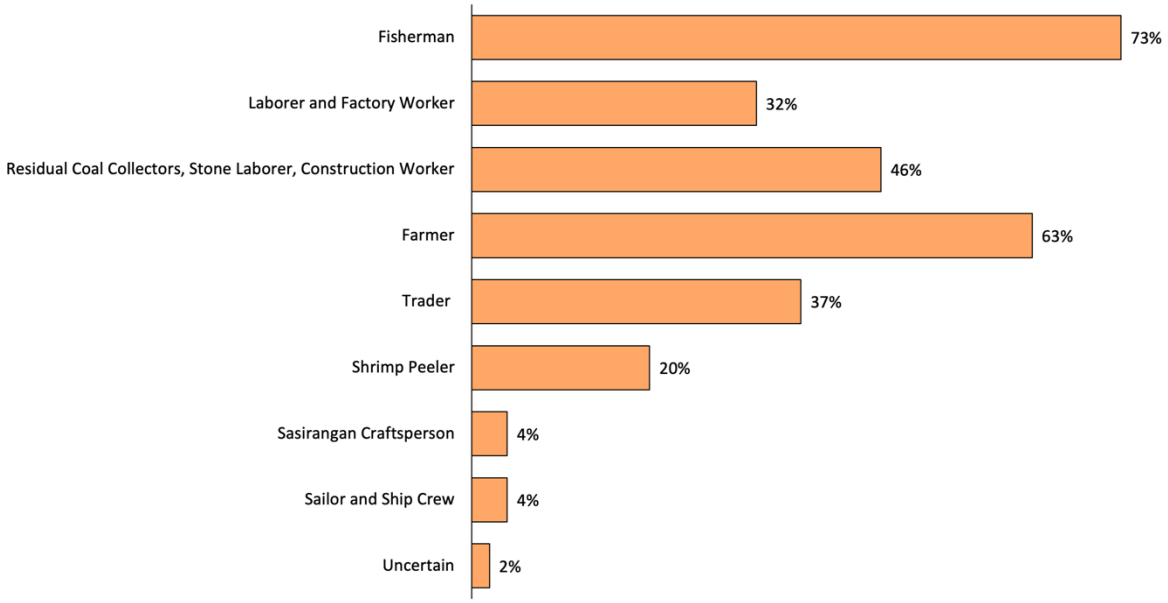


Figure 2. Frequency of job options crossing respondents' perceptions.
Source: Processed by author.

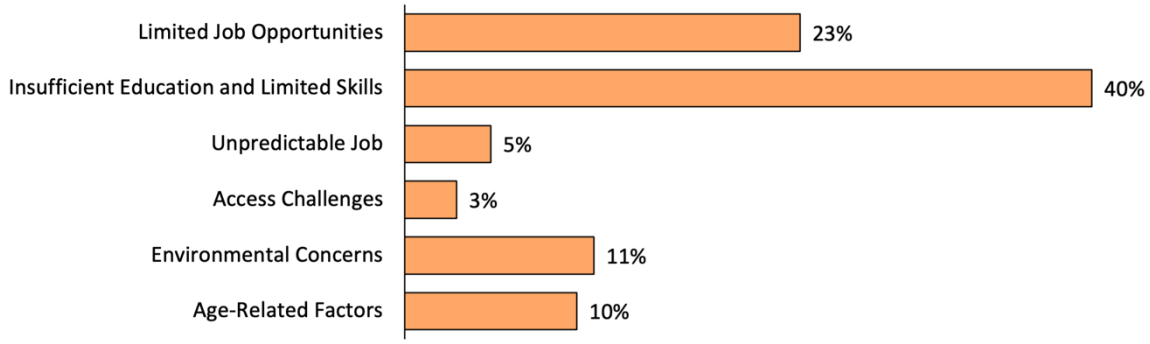


Figure 3. Frequency of factors crossing respondents' perceptions.
Source: Processed by author.

Following that, respondents discuss the forms and constraints of adapting their livelihoods in each livelihood capital (human, natural, physical, financial, and social capital). Both forms and constraints are narrated based on the respondents' knowledge and experiences, supplemented by relevant theories and assumptions. These are summarized and explained in Table 1 and Table 2 below.

Table 1. Description of livelihood adaptation forms.

Forms of Livelihood Adaptation	
Human Capital Approach	Physical Capital Approach

Forms of Livelihood Adaptation	
1. Searching for and applying to diverse job. 2. Optimizing the existing job. 3. Pursuing education to a higher level. 4. Becoming a factory worker.	1. Utilizing traditional tools or techniques. 2. Employing boats collaboratively. 3. Purchasing a personal motorbike. 4. Selling personal assets to support family needs. 5. Setting up a shop or stall in front of the house.
Social Capital Approach	Financial Capital Approach
1. Increasing societal concern. 2. Cooperating with others.	1. In debt to neighbours. 2. Receiving social aid from the local government. 3. Counting on financial support from family.
Natural Capital Approach	
1. Renting and working on farmland owned by others. 2. Utilizing cultivated land or family-owned land. 3. Collecting residual coal.	

Source: Processed by author.

Table 2. Description of livelihood adaptation constraints.

Constraints on Livelihood Adaptation	
Human Capital	Physical Capital
1. Age limitations in job applications. 2. Absence of motivation to pursue higher-level education. 3. Insufficient general education information. 4. Absence of work experience. 5. Limited job opportunities.	1. Damaged roads and bridges. 2. Limited internet access. 3. Limited housing facilities. 4. Lack of environmental awareness among residents. 5. Limited or no space for setting up a stall in front of the house.
Social Capital	Financial Capital
1. Inappropriate behaviour from neighbours. 2. Social inequality. 3. Jealousy in social interactions.	1. Inappropriate social assistance. 2. Misuse of authority by village officials. 3. Absence of financial aid from family.
Natural Capital	
1. Insufficient funds for renting farmland. 2. Farmland infested by numerous pests. 3. Uncertain collection of residual coals. 4. Private-owned land poses an obstacle to the development of roads and public facilities.	

Source: Processed by author.

These forms and constraints are analyzed using Garrett's ranking technique. This method begins by calculating percent position using the formula: 100 (R_{ij} – 0.5) / N_j. The number of items ranked (N_j) is the main differentiator in indicating percent position. In each category of capital (in terms of both forms and constraints), there is a varied number of items ranked, between 2 to 5 items. Table 3 illustrates the percent position according to the Nj in each category. Each percentage is converted into scores, based on Garrett's ranking conversion table (Garrett & Woodworth, 1966).

Table 3. Percent position according to number of items ranked (Nj) and rank given (Rij).

Number of Items Ranked (N_j)	Rank Given (R_{ij})	Formula	Percent Position in Conversion Table	Garrett Score
$N_j = 2$	Rank 1	100 (1 - 0.5) / 2	25	63
	Rank 2	100 (2 - 0.5) / 2	75	37
$N_j = 3$	Rank 1	100 (1 - 0.5) / 3	16.7	69
	Rank 2	100 (2 - 0.5) / 3	50	50
	Rank 3	100 (3 - 0.5) / 3	83.3	31
$N_j = 4$	Rank 1	100 (1 - 0.5) / 4	12.5	73
	Rank 2	100 (2 - 0.5) / 4	37.5	56
	Rank 3	100 (3 - 0.5) / 4	62.5	44
	Rank 4	100 (4 - 0.5) / 4	87.5	27
$N_j = 5$	Rank 1	100 (1 - 0.5) / 5	10	75
	Rank 2	100 (2 - 0.5) / 5	30	60
	Rank 3	100 (3 - 0.5) / 5	50	50
	Rank 4	100 (4 - 0.5) / 5	70	40
	Rank 5	100 (5 - 0.5) / 5	90	25

Source: Processed by author.

Subsequently, this Garrett score is multiplied by the frequencies corresponding to each rank within each category of capital. The total Garrett score and its mean score are presented in Tables 4-13 below.

Table 4. Summary of Garrett mean scores and ranks for human capital-driven livelihood adaptation.

No	Forms of Livelihood Adaptation (Human Capital)	Score of Ranks				Total Score	Mean Score	Rank (R)
		1	2	3	4			
1.	Searching for and applying to diverse job.	2336	4592	1188	621	8737	53.27	2
2.	Optimizing the existing job.	7811	1680	880	189	10560	64.39	1
3.	Pursuing education to a higher level.	365	560	2640	2403	5968	36.39	4
4.	Becoming a factory worker.	1971	3360	2156	756	8243	50.26	3

Source: Processed by author.

Table 5. Summary of Garrett mean scores and ranks for social capital-driven livelihood adaptation.

No	Forms of Livelihood Adaptation (Social Capital)	Score of Ranks		Total Score	Mean Score	Rank (R)
		1	2			
1.	Increasing societal concern.	7623	1591	9214	56.18	1
2.	Cooperating with others.	4095	3663	7758	47.30	2

Source: Processed by author.

Table 6. Summary of Garrett mean scores and ranks for physical capital-driven livelihood adaptation.

No	Forms of Livelihood Adaptation (Physical Capital)	Score of Ranks					Total Score	Mean Score	Rank (R)
		1	2	3	4	5			
1.	Utilizing traditional tools or techniques.	3600	2940	1100	800	625	9065	55.27	2
2.	Employing boats collaboratively.	2550	3420	900	1200	625	8695	53.02	3

No	Forms of Livelihood Adaptation (Physical Capital)	Score of Ranks					Total Score	Mean Score	Rank (R)
		1	2	3	4	5			
3.	Purchasing a personal motorbike.	4125	1680	3100	440	200	9545	58.20	1
4.	Selling personal assets to support family needs.	1875	1380	1600	1840	950	7645	46.62	5
5.	Setting up a shop or stall in front of the house.	2550	2040	1400	1240	925	8155	49.73	4

Source: Processed by author.

Table 7. Summary of Garrett mean scores and ranks for financial capital-driven livelihood adaptation.

No	Forms of Livelihood Adaptation (Financial Capital)	Score of Ranks			Total Score	Mean Score	Rank (R)
		1	2	3			
1.	In debt to neighbours.	552	1650	3813	6015	36.68	3
2.	Receiving social aid from the local government.	3243	4250	992	8485	51.74	2
3.	Counting on financial support from family.	7452	2150	403	10005	61.01	1

Source: Processed by author

Table 8. Summary of Garrett mean scores and ranks for natural capital-driven livelihood adaptation.

No	Forms of Livelihood Adaptation (Natural Capital)	Score of Ranks			Total Score	Mean Score	Rank (R)
		1	2	3			
1.	Renting and working on farmland owned by others.	3795	4750	700	9245	56.37	2
2.	Utilizing cultivated land or family-owned land.	6900	2650	550	10100	61.59	1
3.	Private-owned land poses an obstacle to the development of roads and public facilities.	966	550	6950	8466	51.62	3

Source: Processed by author.

Table 9. Summary of Garrett mean scores and ranks for constraints on human capital-driven livelihood adaptation.

No	Constraints on Livelihood Adaptation (Human Capital)	Score of Ranks					Total Score	Mean Score	Rank (R)
		1	2	3	4	5			
1.	Age limitations in job applications.	2325	1680	1550	280	1675	7510	45.79	5
2.	Absence of motivation to pursue higher-level education.	1950	1680	1400	1840	900	7770	47.38	4
3.	Insufficient general education information.	750	2220	2750	1880	375	7975	48.63	3
4.	Absence of work experience.	2400	3960	1800	920	175	9255	56.43	2
5.	Limited job opportunities.	8025	1260	700	680	125	10790	65.79	1

Source: Processed by author.

Table 10. Summary of Garrett mean scores and ranks for constraints on social capital-driven livelihood adaptation.

No	Constraints on Livelihood Adaptation (Social Capital)	Score of Ranks			Total Score	Mean Score	Rank (R)
		1	2	3			
1.	Inappropriate behaviour from neighbours.	966	950	4061	5977	36.45	3
2.	Social inequality.	6969	2800	217	9986	60.89	1
3.	Jealousy in social interactions.	2967	4700	837	8504	51.85	2

Source: Processed by author.

Table 11. Summary of Garrett mean scores and ranks for constraints on physical capital-driven livelihood adaptation.

No	Constraints on Livelihood Adaptation (Physical Capital)	Score of Ranks					Total Score	Mean Score	Rank (R)
		1	2	3	4	5			
1.	Damaged roads and bridges.	8700	780	700	240	375	10795	65.82	1
2.	Limited internet access.	225	2460	750	1040	1975	6450	39.33	5
3.	Limited housing facilities.	2325	3660	2150	1040	75	9250	56.40	2
4.	Lack of environmental awareness among residents.	2175	1920	2550	1400	425	8470	51.65	4
5.	Limited or no space for setting up a stall in front of the house.	2625	2340	1450	1800	400	8615	52.53	3

Source: Processed by author.

Table 12. Summary of Garrett mean scores and ranks for constraints on financial capital-driven livelihood adaptation.

No	Constraints on Livelihood Adaptation (Financial Capital)	Score of Ranks			Total Score	Mean Score	Rank (R)
		1	2	3			
1.	Inappropriate social assistance.	7797	1800	465	10062	61.35	1
2.	Misuse of authority by village officials.	1035	3800	2263	7098	43.28	3
3.	Absence of financial aid from family.	2898	2500	2232	7630	46.52	2

Source: Processed by author.

Table 13. Summary of Garrett mean scores and ranks for constraints on natural capital-driven livelihood adaptation.

No	Constraints on Livelihood Adaptation (Natural Capital)	Score of Ranks				Total Score	Mean Score	Rank (R)
		1	2	3	4			
1.	Insufficient funds for renting farmland.	4234	2408	1936	513	9091	55.43	2
2.	Farmland infested by numerous pests.	1825	3416	2464	594	8299	50.60	3
3.	Uncertain collection of residual coals.	5548	1568	1628	621	9365	57.10	1
4.	Private-owned land poses an obstacle to the development of roads and public facilities.	1533	2632	1012	1971	7148	43.59	4

Source: Processed by author.

For better clarity, these tables are also represented with diagrams in the next discussion. The diagrams illustrate the Garrett mean score and rank associated with each item related to the forms of livelihood adaptation and the associated constraints. A higher score indicates a superior rank, providing insights into the most widely adopted form or dominant preference among respondents. Further, diagrams indicate the key constraints faced by respondents. The subsequent discussion will delve into the forms of livelihood adaptation and the constraints associated with them, respectively.

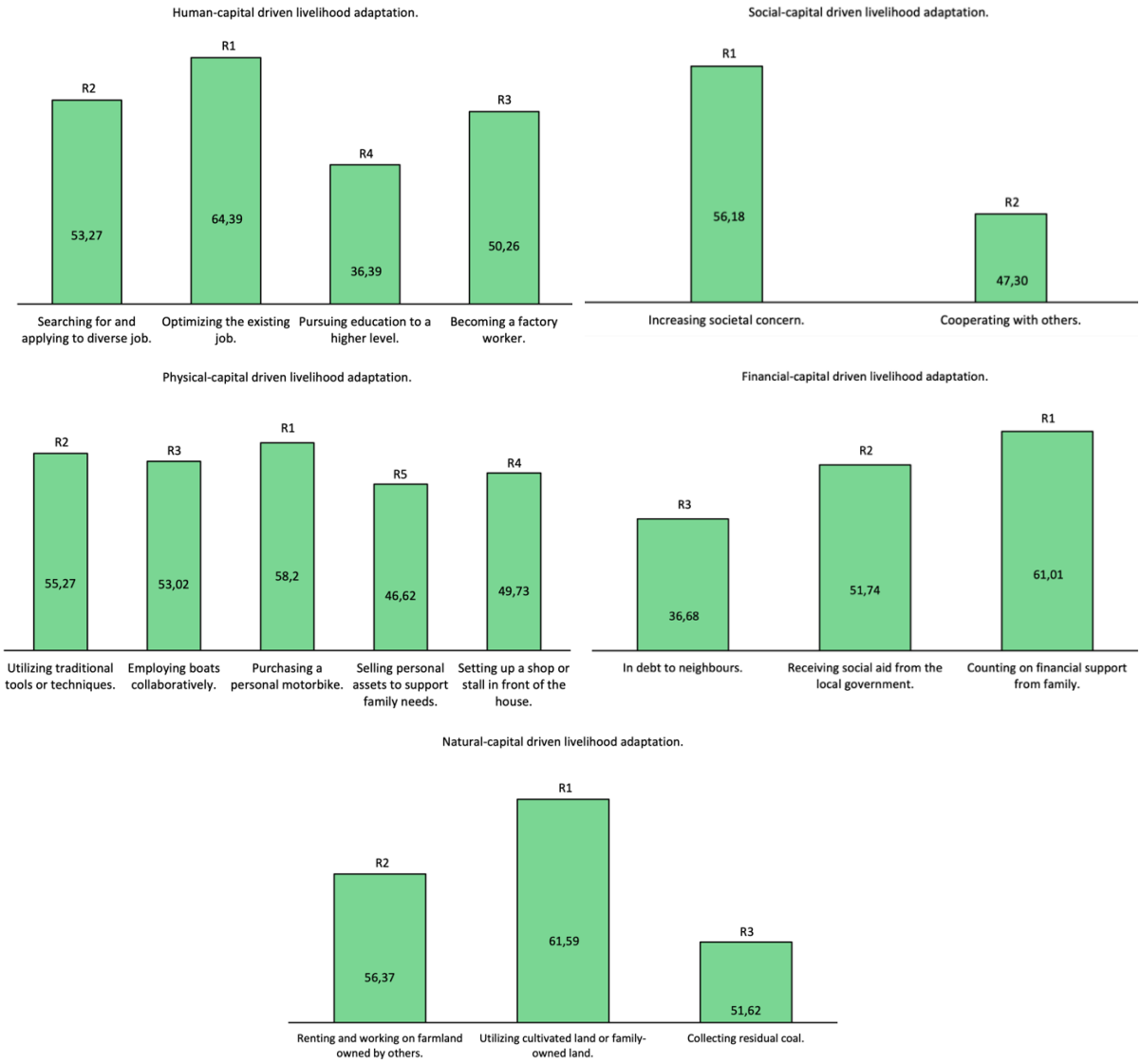


Figure 4. Key evidence and summary of findings in livelihood adaptation forms.
Source: Processed by author.

Human capital-driven livelihood adaptation

The most preferred human capital-driven livelihood adaptation among residents is 'Optimizing the existing job' (R1), followed by 'Searching for and applying to diverse job' (R2), 'Becoming a factory worker' (R3), and 'Pursuing education to a higher level' (R4). It is worth noting that the scores of three adaptation forms (R1-R3) are not significantly different from each other, but they significantly exceed the scores of the form in R4.

Residents can engage in various jobs such as dry-land rice farming, two-wheeled motorbike taxi driving, traditional motorboat taxi services, construction work, employment in the plywood

industry, collecting residual coal, trading, piloting ships, peeling shrimp, and fishing. Unfortunately, the monthly income from these jobs ranges from Rp1,000,000 to Rp1,500,000 ($65 to $100), falling below the Regional Minimum Wage (UMR). Moreover, their expenses exceed 90% of their income (Shofwan et al., 2021). This information confirms that job and employment in a slum area tend to be impermanent, precarious, and associated with unpredictable income (Akter et al., 2021). To fulfill their daily needs, the community adapts by actively searching for and applying to varied jobs. Opportunities to work as fishermen (mentioned by 73% of respondents), as well as farmers (mentioned by 63% of respondents), are alternative job options that can be pursued by residents. Meanwhile, it is also important to observe that pursuing higher education is not a popular preference. Research reveals that parents and family members with limited and low educational backgrounds tend not to place a high value on education. This is also often due to limited financial resources and time available to support education (Cameron, 2011). This evidence aligns with the situation in Mantuil village, where most residents have not enrolled in higher-level education.

Social capital-driven livelihood adaptation

The most preferred social capital-driven livelihood adaptation among residents is 'Increasing societal concern' (R1), followed by 'Cooperating with others' (R2). Both adaptations are interconnected. This societal concern can facilitate effective cooperation or collaboration and improve engagement between residents.

Both forms of adaptation develop and evolve in the village through social interactions. A neighbourhood or a community in a slum area shares a similar economic level and status, while close interaction flourishes due to the proximity of residency. This proximity also fosters togetherness or a sense of unity as the means to improve the overall quality of life. Evidence indicates that social capital plays a role in strengthening a community's resilience, as residents share important information and support each other, even during their own difficulties (Akter et al., 2021; Domínguez & Watkins, 2003; Prasadini et al., 2019). This social capital becomes even more critical during times of crisis and hardship. Moreover, trust and networks serve as the foundational norms and values guiding social interactions in the community. Mantuil village is dominated by the Banjar tribe whose community's characteristics recognize the existence of a cooperation system and have a strong kinship called "bubuhan" in the local language. This means their socio-cultural life is still strongly attached to their lives (Nugroho et al., 2020).

Physical capital-driven livelihood adaptation

The most preferred physical capital-driven livelihood adaptation among residents is 'Purchasing a personal motorbike' (R1), followed by 'Utilizing traditional tools or techniques' (R2), 'Employing boats collectively' (R3), 'Setting up a shop or stall in front of the house' (R4), and 'Selling a personal asset to support family needs' (R5). However, it is notable that there is no significant difference observed in the Garrett mean score for each form of physical capital-driven adaptation. This indicates that the adaptations are selected and implemented fairly by the residents.

Purchasing a motorbike is preferred and implemented frequently by residents due to limited access to roads and public transport reaching their neighborhood. As mentioned before, the only access to the research location is through the Pulau Bromo Pedestrian Bridge, which can only be traversed by motorbike or on foot. Further, purchasing a motorbike is the right adaptation form to choose because the neighborhood is solely connected by a small wooden bridge. A motorbike is an effective choice for their mobility. Better mobility can capture varied opportunities. For instance, motorbike ownership may increase people's income through opportunities such as becoming motorbike-taxi drivers. A motorbike also functions as a mode of transporting goods, and its operating

expenses remain within an affordable range (Evans et al., 2018). Moreover, residents tend to utilize the available physical capital to maintain their livelihood, such as tools, boats, and lands, and even sell these assets. This physical capital generates income and helps residents deal with risks and uncertainties (Yang et al., 2021).

Financial capital-driven livelihood adaptation

The most preferred financial capital-driven livelihood adaptation among residents is 'Counting on financial support from family' (R1), followed by 'Receiving social aid from the local government' (R2) and 'In debt to neighbors' (R3)**.** The rankings and scores presented here also suggest that adaptations in R2 and R3 are more likely to be pursued and expected when residents lack family support.

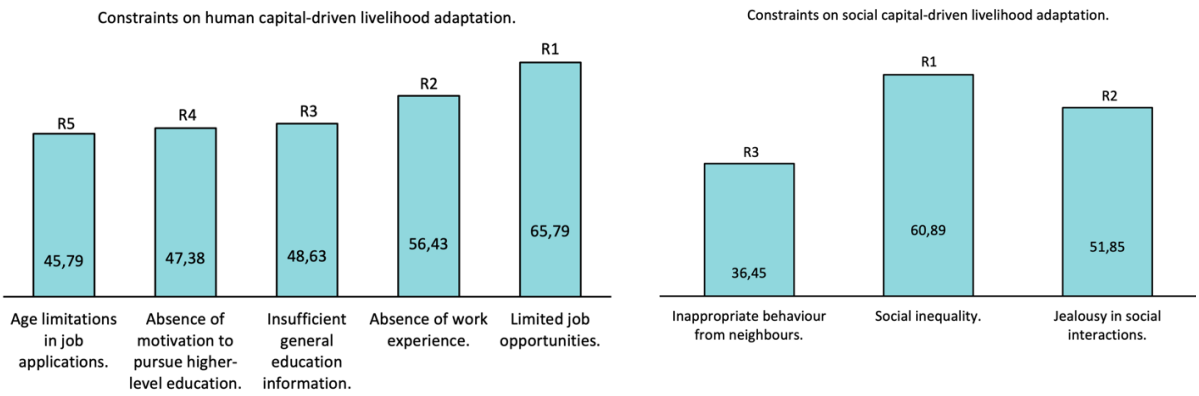
Family remains important for many residents, providing financial support through transfers or direct visits. Even those who are financially well-off may regularly visit their families. Research suggests that having a family member as the wage earner increases the likelihood of accessing basic service (Ferguson & Navarrete, 2003). Besides, slum residents may face challenges in obtaining financial assistance from formal institutions like banks. Therefore, there is a strong reliance on informal credit within the community and social support from local government authorities (Farrington et al., 2002; Krishna et al., 2014; Rakodi & Lloyd-Jones, 2002).

Natural capital-driven livelihood adaptation

The most preferred natural capital-driven livelihood adaptation among residents is 'Utilizing cultivated land or family-owned land' (R1), followed by 'Renting and working on farmland owned by others' (R2) and 'Collecting residual coal' (R3).

The adaptation of cultivating agricultural land is facilitated by the substantial potential of available agricultural space in the South Banjarmasin sub-district, spanning an area of 1,416 hectares (DKP3, 2020). Further, the practice of farming has become a longstanding tradition passed down through generations, particularly during the rainy season (Nugroho et al., 2020). The presence of the Barito River, traversed by coal-carrying barges, offers an opportunity for residents to increase their income by engaging in the collection of residual coal (Wisnuaji & Fauzi, 2022). The utilization of collective boats within the community facilitates this collection process.

Next, the discussion will focus on the key constraints faced in adapting livelihoods. The Figure 5 highlights the key evidence of this discussion.



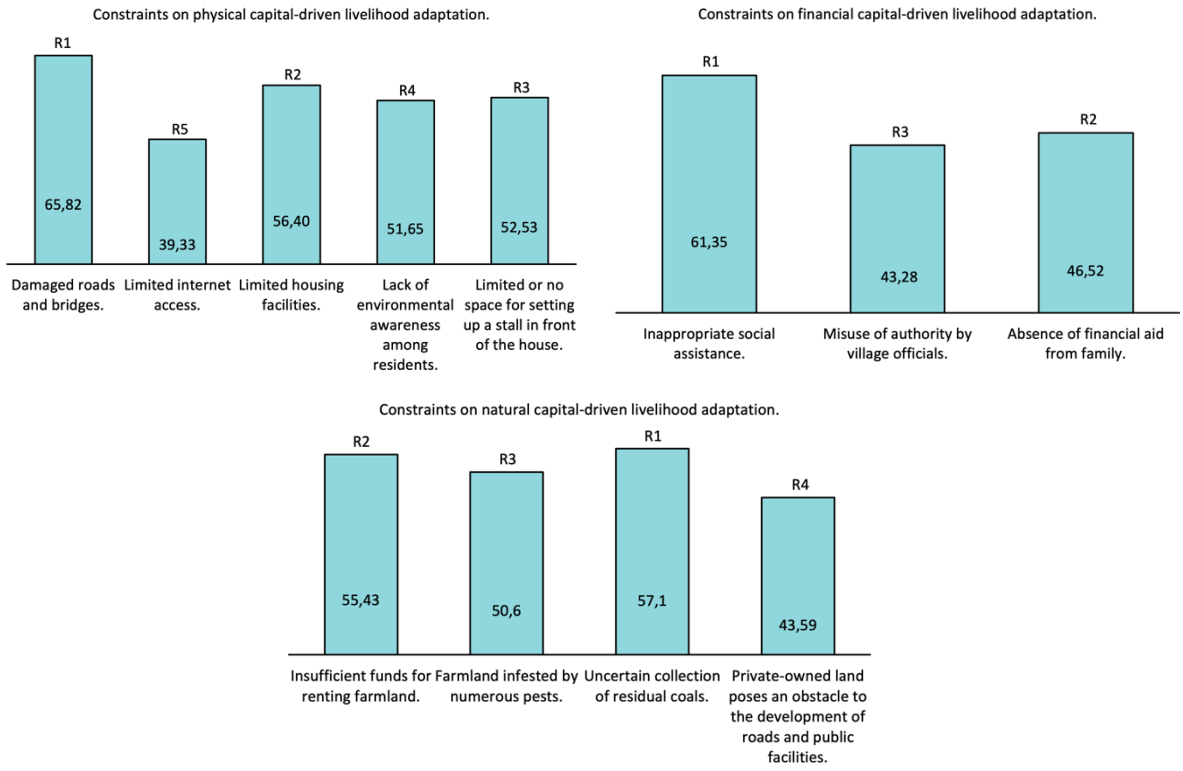


Figure 5. Key evidence and summary of findings on constraints in livelihood adaptation forms. Source: Processed by author.

Constraints on human capital-driven livelihood adaptation

The key constraint is 'Limited job opportunities' (R1). It is followed by 'Absence of work experience' (R2), 'Insufficient general education information' (R3), 'Absence of motivation to pursue higher-level education' (R4), and 'Age limitations in job applications' (R5). However, if more job opportunities are created and become available, residents will have a greater chance to work, regardless of their varied backgrounds.

Over 95% of respondents recognize the challenges in finding employment around Mantuil village due to limited job opportunities in the area. The first ranked constraint here is interconnected with other constraints (R2-R5). As mentioned previously, about 40% of participants mention constraints such as lack of work experience and education. Inadequate information about education for youth in Mantuil village contributes to the low education levels, further exacerbated by the absence of educational facilities for higher-level education in the surroundings. These constraints form a vicious cycle where few job opportunities can cause poverty and low-income living situations, leading to lower education levels and a reduction in human capital (Adaman et al., 2006; Ernst et al., 2013; Jones, 2017; Kurnia & Septiani, 2021; Rifai et al., 2021; Saifuloh et al., 2019).

Constraints on social capital-driven livelihood adaptation

The key constraint is 'Social inequality' (R1). It is followed by 'Jealousy in social interaction' (R2) and 'Inappropriate behaviour from neighbours' (R3). If these constraints persist and cannot be reduced, residents are least willing to engage or even cooperate with each other.

Overall, the constraints outlined in this section have the potential to foster division and tension within society, thereby reducing the unity and interaction among residents (Scheffer et al., 2017; Stiglitz, 2012). Such tensions indeed change people's behavior, and the form of social capital-driven adaptation will ultimately be changed (Farrington et al., 2002). Moreover, Domínguez & Watkins

(2003) explain that unemployed people or people with low wages can hardly participate in traditional exchange networks and cooperation. This is due to these people's inability to reciprocate the received support and help.

Constraints on physical capital-driven livelihood adaptation

The key constraint is 'Damaged road and bridges' (R1). It is followed by 'Limited housing facilities' (R2), 'Limited or no space for setting up a stall in front of the house' (R3), 'Lack of environmental awareness among residents' (R4), and 'Limited internet access' (R5). For years, this physical limitation or damage has been a complaint of the residents, and thus they have been expressing their aspirations to the local government to resolve these constraints.

It is obvious that a low level of infrastructure will hinder any implementation of activities and forms of adaptation. In other words, without good infrastructure, there will be an absence of many accesses for residents to expand and boost their livelihoods (Hidayati & Permana, 2021; Naufal et al., 2023; Olsson et al., 2014; Yang et al., 2021). Damaged roads and wooden bridges are the main issues reported by most residents in Mantuil village. Residents expect that these damaged roads and wooden bridges can be fixed and developed as soon as possible by the local government. Other constraints include a lack of awareness about the environment, which can decrease residents' sense of responsibility in protecting their area and its shared facilities (Chen et al., 2013; Wang et al., 2021). Moreover, some residents still complain about the limited internet access.

Constraints on financial capital-driven livelihood adaptation

The key constraint is 'Inappropriate social assistance' (R1). It is followed by 'Absence of financial aid from family' (R2), and 'Misuse of authority by village officials' (R3). This indicates the significant issues and complexity of the financial aid scheme and its distribution.

Slum residents can receive external assistance, which may come in the form of monetary or non-monetary support from either the community or local government (Yang et al., 2021). Unfortunately, residents report that many social assistance programs are inappropriate and not suitable. For instance, funds intended for children's educational support may be diverted by parents for other purposes. Also, social assistance is not delivered to the right persons who genuinely require it. The main cause is usually derived from the misuse of authority by officials and organizations, resulting in fund misallocation for private interests (De Wit & Berner, 2009).

Constraints on natural capital-driven livelihood adaptation

The key constraint is 'Uncertain collection of residual coals' (R1). It is followed by 'Insufficient funds for renting farmland' (R2), 'Farmland infested by numerous pests' (R3), and 'Private-owned land poses an obstacle to the development of roads and public facilities' (R4). Indeed, these nature-related risks are uncontrollable and can only be mitigated by sufficient preparation and support from both society and government.

The reliance on collecting residual coal from the barges' transporting coal is inevitable for some residents. However, in this form of informal collection, the amount of residual coal collected is uncertain. This uncertainty is also due to extreme weather variations that cause floods and storms. This extreme weather not only becomes a barrier for residents to collect residual coal but also increases pest attacks, affecting the agricultural output of residents. Besides, residents have limited capital to increase inputs for agriculture and limited possibilities for land extension. Further, a constraint here involves obstacles arising from privately owned land areas. Proper planning, maintenance, and discussions with relevant stakeholders are necessary to prevent potential land dispute issues (Obianyo et al., 2021). All the mentioned constraints in the context of nature are difficult

to prevent and control (Yang et al., 2021). Thus, in this case, residents' resilience must be strengthened (Marschke & Berkes, 2006). This resilience can be developed with livelihood diversification and an understanding of conflict and crisis management.

CONCLUSIONS

In conclusion, livelihood adaptation analysis using Garrett's ranking technique provides an insight into residents' forms of adaptation and the constraints they face in a slum area. Residents become the main source in the analysis, as they directly discuss and inform about the actual situation in the area. The analytical procedure originates from the input of residents and subsequently returns to them for further discussion and validation. This analysis also complements the assumptions and theories regarding slums and their residents.

Based on the results and discussions, each livelihood capital (human, social, physical, financial, and natural capital) generates numerous forms of adaptation. Each capital also comprises different constraints. The dominant livelihood adaptation can be highlighted and supported, with the key constraints serving as valuable inputs to be addressed. The dominant adaptation forms involve 1) Searching for and applying to diverse job; 2) Increasing societal concern; 3) Purchasing a personal motorbike; 4) Counting on financial support from family; 5) Utilizing cultivated land or family-owned land. Meanwhile, the key constraints comprise 1) Limited job opportunities; 2) Social inequality; 3) Damaged roads and bridges; 4) Inappropriate social assistance; 5) Uncertain collection of residual coals. Both adaptation forms and constraints are interconnected, with resolving constraints being essential for facilitating effective adaptation.

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