

# STAYING DECISION MAKING PROCESS IN DISASTER PRONE AREA: A GROUNDED THEORY METHOD STUDY ON FISHERMEN COMMUNITY IN SEMARANG COAST, INDONESIA

Choirul Amin<sup>1\*</sup>, Sukamdi<sup>2</sup>, Rijanta<sup>3</sup>

<sup>1</sup>Faculty of Geography, Universitas Muhammadiyah Surakarta, Indonesia

<sup>2,3</sup>Faculty of Geography, Universitas Gadjah Mada, Indonesia

\*ca122@ums.ac.id

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## Abstract

**Purpose of the Study:** In an increasing migration driven by climate change disaster, there are people who remain to stay in disaster-prone areas. Even though there is little research on migration to understand non-migrant people, this study seeks to understand the staying decision making process and understand how and why people stay in disaster-prone areas.

**Methodology:** Grounded Theory Method (GTM) is used in this research. The qualitative approach in this study is intended to gain individual insights to reveal the process and steps of staying decision-making in disaster prone-areas.

**Applications:** This study was conducted in the Semarang coastal area, which is simultaneously prone to three disasters, i.e., sea level rise, land subsidence, and tidal inundation. The study shows that staying decision-making was taken in household units. The staying decision-making process consists of interactions between four components: availability of options, motives, expectations, and incentives.

**Results:** Exploring the decision to stay is an opportunity to understand migration processes in a new way. This research adds a conceptual study to the migration literature on the basis of existing theories to explain immobility in disaster-prone areas.

**Keywords:** Migration, Immobility, Decision-Making Process, Tidal Inundation, Climate Change, Fishermen Community, Tambak Lorok

## INTRODUCTION

Disasters triggered by climate change are expected to bring significant changes in migration patterns throughout the world. Increased frequency and severity of chronic environmental hazards and disasters of sudden attacks are projected to change the typical migration patterns of the community (Raleigh, Jordan & Salehyan, 2008).

Climate change is expected to trigger increased population movements due to factors, such as increased intensity of extreme weather events, a rise in sea level, and accelerated environmental degradation. Climate change has adverse consequences for livelihoods, public health, food, security, and water availability. This in turn will have an impact on human mobility, possibly leading to a substantial increase in the scale of migration and displacement.

Marfai et al. (2008) and Amin et al. (2018) shows that residents living in the coastal areas of Semarang have experienced the threat of almost constant tides with various depths of sea water. Even the tidal inundation gradually increases. The residents realized that the areas in which they lived were affected by tidal flooding, but they did not migrate and stayed.

Migration theories ignore structural and personal forces that balance or limit the drivers of migration and lead to different results of immobility. Systematic neglect of the causes and consequences of immobility hinders the efforts to explain why, when, and how people migrate (Schewel, 2019).

Schewel (2019) defines immobility as continuity in an individual's residential place over a period of time. Immobility is never absolute because everyone moves a bit in their daily lives, but always relative to the spatial and temporal framework. "Spatial framework" defines the boundaries in which an individual can be considered "immobile".

Many examples support the claim that aspirations and the ability to migrate (or to stay) often depend on immobility (or mobility) of others. The theory of new economic labor migration, for example, arises from the observation that mobility and immobility are often part of the same household livelihood strategy to diversify income and reduce risk. An individual migration may be an integral part of their "left behind" livelihood strategies at the household level (Stark & Bloom, 1985).

The decisions to migrate (or to stay) involve economic and non-economic considerations. Therefore, migration is a complicated decision that may involve many objectives and conflicts. Prospective migrants collect and assess information about various criteria or objective attributes and these are assessed and considered before the decisions are made ([Baláz, Williams & Fifeková, 2016](#)).

In an increasing migration driven by climate change disaster, there are people who remained to stay in disaster-prone areas. Even though there is little research on migration to understand non-migrant people. This study seeks to understand staying decision process and understand how and why people stay in disaster-prone areas.

## LITERATURE REVIEW

Migration is an intrinsic attribute of mankind and represents a response to danger (war, natural disasters, limited food, and economic crisis). People migrate to survive and migrations are caused by gaps between regions. Conversely, non-migration can cause individuals not to move and take advantage of opportunities that might be found elsewhere ([Ureta, 2008](#)).

The existing migration theory mostly speaks in the context of migration and development. Migration and development studies focus on answering the question of why people migrate. Explanation of why people migrate can be obtained from a series of theories about migration starting from the Laws of Migration by [Ravenstein \(1885\)](#), Push-Pull Theory by [Lee \(1996\)](#), Migration Transition by [Zelinsky \(1971\)](#), Model of Expected Income by [Todaro \(1969\)](#), Spatial Interaction by [Norris \(1972\)](#), General System of Migration by [Mabogunje \(1970\)](#), and Value Expectancy Model by [De Jong and Fawcett \(1981\)](#). However, there are very few migration theories that understand why people do not migrate and remain to stay in the affected area, in spite of them being affected by the disaster.

Discussions on the theory of migration and development see migration as a product of inequality of two regions, whose factors are predicted as economic factors. Thus, migration can also be rationally called as a rational economic decision-making process. The purpose of migration is maximizing profits and utilities so that people migrate to more beneficial areas. According to [De Jong and Fawcett \(1981\)](#), profit calculation is not only economic but can also be in the form of social and psychological benefits. However, the problem is that if there are people who do not move from the disaster area (as in the case of residents on the coast of Semarang), then the rationale cannot be explained by using the theory of migration and development.

Some frameworks of classical migration theory have indeed included environmental conditions as one of the trigger factors for migration, for example, [Wolpert \(1966\)](#), [Lee \(1996\)](#), [Speare \(1971\)](#), and [De Jong and Fawcett \(1981\)](#). [Wolpert \(1966\)](#) stated in the Stress-Threshold Model theory that migration is a response to the pressure experienced in the area of origin. This pressure can be in the form of inhospitable environmental conditions, such as pollution, congestion, and crime. While [Lee \(1996\)](#) stated in the Push-Pull Model that natural disasters that hit the area of origin are one of the driving factors (push factor) for people to migrate. Furthermore, [Speare \(1971\)](#) specifically stated that individual's dissatisfaction with the environment in which they live can affect the mobility of a residence. While another theory that links migration with environmental conditions is the Value-Expectancy (VE) model. [De Jong and Fawcett \(1981\)](#) explained the influence of the comfort value of the living environment on migration decisions in the VE model.

However, this theory of migration and disaster too cannot explain the phenomenon of people who remain to stay in disaster-prone areas. People must migrate from disaster-affected areas, as the area of origin is not beneficial physically, economically, and socially. However, in reality, there are people who do not move from the affected area. Thus, it is appropriate if [King \(2012\)](#) states that one of the future challenges for theorizing migration is the importance of an explanation of people who do not migrate.

Research on migration has only looked at the reality of migration from the point of view of individuals who migrate, so that the data sources of the research mostly originate from migrants. Not surprisingly, [Gomez \(2013\)](#) stated that one of the limitations of migration and disaster research is the amount and quality of existing data that requires careful compilation in places where migration takes place. The main criticism is that although it seems to be generally accepted, the views of classical and contemporary migration ignore the fundamental aspect of people who do not migrate.

The literature review shows a gap in the theory of migration and development where an explanation on why people do not migrate is rarely found. The theory of migration and development does not describe non-migratory people from the perspective of migratory people. Moreover, [Gray and Mueller \(2012\)](#) mentioned a serious problem that most of the knowledge about migration and climate change disaster does not come from the affected place. This situation inflicts data quality problem and the lack of data also. Migration and development theories and migration and disaster theories

tend to ignore immobile people's perspective, as they cannot express their experience. As a result, the perspectives of immobile people are not involved in the knowledge construction and are forgotten in the dynamics of migration theory discussion. Therefore, this research contributes both in the empirical data taken directly from the location threatened by disaster and the contribution in the explanation regarding non-migratory people, even though they are threatened by disaster by exploring the decision to stay. The study aids in understanding the migration process in a new way.

## METHODOLOGY

Staying in a place is challenging from a methodological perspective. Existing census or other longitudinal datasets are often not detailed enough to track the staying behavior across the life course, and surveys of migration aspirations rarely treat the desire to stay ([Carling & Schewel, 2018](#)). Therefore, the decision to stay is not clearly understood.

This research employs the Grounded Theory Method (GTM). Strauss and Corbin in [Creswell \(2007\)](#) defined GTM as a research method with a qualitative approach that uses a set of systematic procedures to inductively construct a theory or concept or abstract analytic scheme of phenomena. The qualitative approach in this study is intended to gain individual insights and reveal the process of deciding to stay in disaster-prone areas.

This study took place in a fishermen community in the Semarang coastal area, Indonesia. The researcher conducted initial observations to identify the main issues related to the purpose of the research, namely, the phenomenon of not moving from the affected area. Observations were mainly carried out to determine the extent to which the tidal flood (rob) affects the physical conditions of the environment and residential areas.

The results of the initial observations supplemented by interviews with several informants showed that Kampong Tambak Lorok was most severely affected by tidal flooding. The location of this Kampong is at the northernmost part of the Semarang Coast and is directly adjacent to the Java Sea. The main issues found from the results of preliminary observations and interviews with informants were: (1) rob is common, (2) Tambak Lorok is a safe village from crime, (3) finding employment is easy in Tambak Lorok, (4) there are residents with middle-upper economic levels who continue to choose to live in disaster-prone areas. These main issues were deepened by in-depth interviews with the next key informants.

The selection of key informants used a purposive technique based on the principle of a subject that has long lived (more than 30 years) in the research area, so that it is assumed to have deep knowledge and experience about the challenges and threats in Kampong Tambak Lorok.

The research informants were the heads of households. The informants were categorized into four groups on the basis of their areas of origin and types of work, namely, (1) working at sea - native people (INF1, INF2, and INF3), (2) working at sea - migrants (INF4, INF5, and INF6), (3) working on land - native people (INF7, INF8, and INF9), and (4) working on land - migrants (INF10, INF11, and INF12). In each category, there were three informants resulting in the total number of informants being 12.

During this research, the researchers lived in the boarding house of the Sumber Wungu family located in Kampong Tambak Lorok with the hope that the relationship between researchers and resource persons will form a rapport, get closer, get more open, and trust each other, so that the information can be deeply explored.

Data collection was carried out through participatory observations and in-depth interviews. The information taken is detailed, in-depth, and explorative, so that the development of related information is possible. The in-depth interview was completed until no new information, which could clarify and deepen the phenomenon, was found.

The data was processed by using several techniques, namely, writing transcripts, writing memos, and analytical archives. This study organized systemic analytical data by using four types of analysis, namely, transcript analysis (coding process), individual life history, diachronic analysis, and visual displays. Transcript analysis is done along with the coding process. The coding process includes three coding stages, namely, open coding, axial coding, and selective coding.

## DISCUSSION / ANALYSIS

Global migration reveals the complex process of decision-making influenced by the continuous interaction between individuals and structures. Moreover, the structures and human agency relationship are mutually reinforcing in the migration process. Therefore, the process of making the decision to migrate can be explained by neither structures nor individuals alone ([Chang, Jackson & Sam, 2017](#)). This research explains the process of making the decision to stay in disaster-prone areas on individuals who have lived most of their lives in the same place in Kampong Tambak Lorok.

### Staying Decision-Making Context: Kampong Tambak Loroks

Kampong Tambak Lorok is the largest fishermen community in Semarang. Tambak Lorok is the ancient name of the largest fishing village in the Semarang coastal area. At present, the village area is divided into two regions with new names; Tambak Mulyo and Tambak Rejo. Even though it has a new name, the surrounding residents and the people of Semarang still refer to the area as Tambak Lorok.

Natural hazards are more serious in the Semarang coastal area. These regions are vulnerable to climate change-related disasters, such as tidal inundation and floods, during the rainy season ([Suhelmi & Prihatno, 2014](#); [Marfai, Almohammad, Dey, Susanto & King, 2008](#)). Most of the coastal areas of Semarang have high levels of risk, vulnerability, and a threat to tidal inundation ([Arief, Purnama & Aditya, 2012](#)). The causes of tidal inundation are the rise of sea level due to climate change and land subsidence ([Marfai & King, 2008](#); [Marfai et al., 2008](#)). Tidal inundation in the Semarang coast is estimated to be higher with the assumption of sea level rise, which constantly increases to 15 cm/year ([Abidin et al., 2010](#)). There are many types of natural disasters related to climate change in the Semarang coast; however, tidal inundation is the most prevalent one, which often floods the Semarang coastal area.

Although vulnerable to disaster, the location of this Kampong is very strategic as per the economic aspect, as it is surrounded by three industrial estates (Tanjung Emas Port Industrial Area, Terboyo Industrial Area, and Kaligawe Industrial Environment), which are located not far from the village. In addition, Kampong Tambak Lorok also has a comprehensive and convenient facility because it is close to the center of Semarang city. This village is only 4.6 kilometers from Simpang Lima, which is the central business district (CBD) of Semarang city. The location of this Kampong is close to the Tawang railway station and Terboyo bus terminal, which are the main infrastructure of transportation that connect cities and provinces in the Java island. In addition, this Kampong is also not far from the Kobong market (another name for the Rejomulyo market), which is the center of fish trade in the city of Semarang and the northern coastal area of Java Island. Tambak Lorok fishermen can easily market their catches.

The location of this Kampong is close to the activity center (market, industry, trade, and port), the center of Semarang city, and the transportation center (the main highway of North Java, Tawang railway station, Terboyo bus terminal). One of the most influential aspects is the location of this village, which is directly adjacent to the Tanjung Emas Port industrial area (500 meters from the Kampong, 5 minutes walking distance). The industries are located in the Tanjung Emas Port area, which is called Tanjung Emas Processing Zone (TEPZ). These industrial estates and ports provide economic opportunities and employment for the residents of Tambak Lorok. In addition to the Tanjung Emas Port area, various industries, namely, the Kaligawe Industrial Environment and Terboyo Industrial Environment, grow in Semarang (not far from Tambak Lorok) and provide economic opportunities to the residents of Tambak Lorok.

Although Kampong Tambak Lorok has a high economic potential, it also has high disaster vulnerability as faced by other regions located in the coastal region. The strategic position is threatened because of its location in the coastal area, which is a transitional area between processes and activities on land and sea, such as marine processes, Aeolian processes, fluvial processes, and intensive human activities. The topography of the Kampong area is a lowland coastal plain with a slope of 0-2%. Such a slope makes the area unlikely for the landslides to occur. However, most of this area is almost the same as sea level even in some places below sea level, and thus it is vulnerable to tidal floods (rob). [Marfai et al. \(2008\)](#) mention some of the potential hazards like tidal flooding and land subsidence that threaten the Semarang coast. The destructive power of naturally occurring threats can increase both in frequency and magnitude if there is a driving aspect in the form of human activity.

### The Staying Decision

The discussion about staying decision-making process is divided into four parts, namely, staying decisions, staying decision-making units, staying decision-making stages, and staying decision-making processes.

Decision making is the process of selecting certain actions from various alternatives to solve problems or difficulties faced. Tambak Lorok residents face a serious problem in the form of periodic robs that increase every year, resulting in the settlements facing the danger of being inundated by robs. Therefore, the decision to stay in disaster-prone areas is a important for the survival of the lives of individuals and families of Tambak Lorok. The following information shows the staying decisions taken by the informant.

"I never thought of moving to another place." [INF1]

"I didn't want to move at all, but for my children, it's up to them where they want to stay." [INF3]

"Even when I was hit by a flash flood, I didn't think of moving from this Kampong." [INF8]

"I am getting older; my strength to go to work in the sea is not as strong as before. I can't stay long at sea and stay more at home. My income has diminished. But I don't know what will be my fate tomorrow, but I will still stay here." [INF5]

Although the Tambak Lorok residents were under pressure due to the lives becoming increasingly difficult, their decision to stay never changed time and again. The residents of Tambak Lorok, who lived in the Kampong for more than four decades, experienced important events that act as the push factors and influence the migration decisions. In 1995, the village faced high tidal inundation (rob - in Javanese) resulting in water entering houses. The height of the inundation increases rapidly as the land decreases in area. The area is like a ship that leaks in the middle of the sea and sinks slowly. However, such pressures did not cause residents to immediately move from Tambak Lorok and they were actually trying to adapt to tidal inundation by elevating the building of their houses, which requires a large amount of money. Residents have proved to be able to finance themselves, build new homes over old houses that have sunk, and adjust to a puddle of rob for more than two decades.

The residents of Tambak Lorok resisted leaving a rob area, even though there were some who felt uncomfortable and decided to move immediately. The question is why are the Tambak Lorok residents remaining calm even after being flooded for days? One argument that can explain this phenomenon is due to the residents being forced to face the rob. This is different from the upper-middle class people, who are wealthy and can move to any place they want, while the lower class people try to adapt to the threat.

"For me, Rob is not a problem anymore. Since a long time ago, I am used to being inundated." [INF4]

"Being hit by rob is normal. If the water has receded, the house will be cleaned. The floor is ceramic, so it's easy to mop and clean it. If the rob is gone, it's dry, it's forgotten." [INF5]

### Staying Decision Making Unit

One important question that will be answered in this section is whether the individual's decision to stay is based on what is "best for the individual's own future" or whether the decision is based on "overall household welfare". In this case, neoclassical microeconomic theory considers that migration decision making is an individual choice, where people are rationally motivated to migrate for maximizing one's personal benefits, both in material and non-material terms (Todaro, 1980; Massey et al., 1993). However, the results of this study show facts that contrast with neoclassical microeconomic theories about the decision making of migration.

The data of this study revealed that it was households, not individuals, who were the center of the non-migration decision making. The information from the following informants is a strong evidence of the statement.

"In 1996, we were hit by a big rob at knee height, then I negotiated with my wife to move from this village, but my wife didn't want to because her job was here." [INF10]

"My second child once said: Father, how if we sold our house, because it is often hit by rob. I replied: How come, son! Rob came from God. We cannot reject it. Moreover, the work of your father and mother is also here. Then, my child kept telling his mother: Mother, how if we sold our house, so we buy a house in an area that is not inundated by rob and more comfortable. Then, my wife said: Your father and your mother are getting old, so we will stay here. Later, when you have a family, you can find a place to live in another area. Your father and your mother will come to your house to look at their grandchildren. After this, my child never told us to move again." [INF4]

The decision to stay in the INF4 family was taken through dialogue between family members. As the head of the family, INF4 does not necessarily make its own decisions, but asks for opinions from his wife. Meanwhile, his son seems to have been able to compare between living in the dry area, which is free of rob, and in the Tambak Lorok that is affected by rob. His son felt uncomfortable living in Tambak Lorok and so he again advised his parents to move. However, INF4 and his wife refused the proposal by stating the reasons for being tied to work and getting older.

The following information also shows that the role of the spouse (wife/husband) is significant in making decisions whether to move or stay in Tambak Lorok.



"I still have plans to move from this village, but indeed, I have no desire to move. On the other hand, my wife actually follows my will. It's just that my wife sometimes wants to move and she sometimes doesn't want to move." [INF9]

"I think about the future, if I get older, I will not be able to make money. While being here, I am charged for raising the building. Thus, sometimes I want to move, but sometimes I don't. But clearly, my wife did not want to move because she was born in Tambak Lorok." [INF11]

"I once wanted to move from here, but my wife didn't want to move because her parents and all siblings lived here." [INF12]

The information above shows that staying decision-making is taken by household units, and not by individuals. Wives, husbands, and children are involved together in the decision-making process. The husband wants to move, but if the wife does not agree, then the family stays in Tambak Lorok.

The results of this study are in line with the results of [Clark, Duque-Calvache, and Palomares-Linares \(2017\)](#) in Spain that families play an important role in the decision whether to stay or move. In addition, [Stark and Bloom \(1985\)](#) and [Fischer and Malmberg \(2001\)](#) state that migration decisions are rarely made by an individual, and more often such decisions are made by family members and households. The household theory of labor migration contends that decisions to migrate are rarely reached by individual actors without the consideration of household needs. Such a framework suggests that the individual's decision to move or stay is not based on maximized expected income, but on interests and benefits of family members.

This can be seen in the INF4 family, whose child wants to move because he is not comfortable with rob, but the family accommodates the interests of other family members, namely, INF4 as a father who works as a fisherman and his wife sells fish and they are not profitable enough to move from Tambak Lorok. In addition to economic interests, the wife of INF4 also felt that they were getting older and she would be unable to pay because it would be far from her workplace, if she moved from Tambak Lorok. For example, the INF5, INF10, INF11, and INF12 families actually want to move from Tambak Lorok because they feel that they are getting older and increasingly unable to work hard to meet the renovation needs of houses, which are increasingly sinking by rob. However, one of the wives was originally from Tambak Lorok and did not want to move because all her extended family members were living in Tambak Lorok. The decision of the family staying in Tambak Lorok was taken because of the interests of other family members, especially the spouse.

Hence, it is clear that staying decision-making units in areas prone to rob and land degradation in Kampong Tambak Lorok occurs at the household level. This shows the perspective of decisions is not individualistic, but collective. This means that the staying decision is not taken individually by an individual, but is the result of collective decisions in the household that involve the components of the nuclear family, namely, husband, wife, and children.

### **Staying Decision Making Process**

The staying decision-making process in disaster-prone areas by residents of Tambak Lorok will be discussed using the Motivation theory of decision from Atkinson. [Sell and Dejong \(1978\)](#) state that research on migration decision making has been evaluated from the perspective of a motivational theory of decision making adapted from John Atkinson and his colleagues. The motivational approach to the migration decision-making process consists of interactions between four components, namely, availability of options, motives, expectations, and incentives.

Availability concept considers the availability of choices for migration decision makers both cognitively and physically. Two possible behaviors arise from such a concept. First, there are people who do not move because the informant never evaluates the advantages and disadvantages seriously, resulting in the absence of cognitive migration choice. Therefore, although objective considerations can support the occurrence of migration, this possibility is not considered by individual decision makers. This can be seen from the statements of informants, who indicated that they never thought they would move from Tambak Lorok.

The second possibility is that there are people who live in places where the informant is currently at a risk of being lost, and the informant is therefore forced to move. Thus, the informants do not make the migration decisions by themselves. This is a condition faced by forced migrants due to natural disasters or displacement of settlements due to government interests. Tambak Lorok residents experience environmental pressures stemming from inundation and land subsidence as well as policy pressures from port managers who need land for development, requiring the informants to move from the

area. Therefore, the informants have no choice but to move from their residence. However, some informants managed to face the environmental pressure for decades and remained in the area until now.

The concept of motive is an impulse that moves a person to behave on the basis of individual needs. Thus, the motive for migration is the driving force within a person to migrate. [Sell and Dejong \(1978\)](#) suggest that the motives of migrants can be economic, family ties, social ties, or a combination of these three motives. In a case under study, the underlying motives of the Tambak Lorok population to stay behind were a combination of economic motives, family ties, and social ties in their communities.

The concept of expectancy refers to subjective evaluation of the decision maker on the possibility of achieving goals. The value expectancy model proposed by [De Jong and Fawcett \(1981\)](#) explains that the decision to move is based on a specification of personally assessed goals, which can be achieved either by moving or by staying. This model emphasizes that migration decisions are the result of a comparison of benefits between staying in the place of origin and at the destination. If the benefits of staying in the place of origin are more than at the destination, there will be no migration. If the benefits of staying at the destination are greater than in the original place, then migration will occur. The residents of Tambak Lorok say that they get more benefits when they live in Tambak Lorok when compared to other places. This explains the informants' high expectations of the village where they live.

The value expectancy model defines the desire to migrate is the sum of the expected value of benefits, which includes dimensions of well-being, social status, comfort, autonomy, affiliation, and morality ([De Jong & Fawcett, 1981](#)). The residents of Tambak Lorok obtained all dimensions of the value of benefits and hence decided to stay in the village.

One of the most important things from the value expectancy model is the expectation of obtaining affiliation, namely, the benefits obtained by living near family members or being part of a group or a community ([De Jong and Gardner, 1981](#)). The close and harmonious social relations in the village provide strong affiliations that significantly influence the decision to stay in Tambak Lorok.

Furthermore, the concept of incentives in the motivational theory of decision making refers to the factors associated with the results that can be achieved by encouraging (incentives) or holding (disincentives) the intended change in behavior. [Speare \(1971\)](#) suggest economy as one of the forms of incentive for migration. These economic incentives are in the form of high-paying employment opportunities or the availability of jobs with more numbers than elsewhere.

[Fischer and Malmberg \(2001\)](#) reported that work and family ties are the main determinants of immobility. The Tambak Lorok area offers enormous economic opportunities in the form of job availability both in the sea (fishermen) and on land (industries around the port). In addition to the abundant amount of work available, it also provides a high level of income, especially in jobs related to marine resources, such as fishermen and fish traders. The big economic opportunity is an incentive to encourage residents of Tambak Lorok to stay. In other words, the biggest economic opportunity is a disincentive that holds the population to stay in Tambak Lorok.

Another form of incentive or disincentive is what is generally referred to as sociological factors. [Sell and Dejong \(1978\)](#) posit that social attachment and family attachment can prevent migration. In this study, the population of Tambak Lorok has close social relations among residents.

The intimacy between residents of Tambak Lorok arises due to the existence of mutual affection like the experience of environmental stress, such as rob, and the threat of eviction. The same experience causes the similarity of mindset, ideas, and behavior of individuals in groups. These equations formed the culture of the community of Kampong Tambak Lorok, which gave birth to social attachments for surviving the existing pressure and preventing migration. In addition, residents of Tambak Lorok have strong kinship ties because the informants, starting from great-grandparents, grandparents, father-mother, uncle-aunts, to children and grandchildren, still live in the village. These socio-cultural factors make the residents comfortable in living in Tambak Lorok and detain informants from migrating out of the Kampong.

[Amin, Sukamdi and Rijanta \(2019\)](#) surveyed Tambak Lorok residents and found them lazy to move away from their current place because they did not want to lose the social environment, which was considered as the most valuable by them.

The adaptation of the informants was in dealing with the rob disaster and being able to overcome the disaster. If people are able to survive it, then it means that the person can adapt to deal with environmental conditions. In the case of Kampong Tambak Lorok, the community remained to stay in the rob areas, which means that the informants succeeded in the adaptation process and did not need to move from the affected area.

## CONCLUSION

Exploring the decision to stay is an opportunity to understand migration processes in a new way. The study shows that staying decision-making takes in household units. The decision is the result of collective decisions in the household. The decision of staying consists of interactions between four components, namely, availability of options, motives, expectations, and incentives. It was found that the decision to stay is a reasonably conscious process.

Researchers should turn their attention to immobility decision-making to get a better understanding of contemporary mobility dynamics. Future research on immobile population could ask what kinds of factor are emerging in the process of staying decision-making and how those factors affect population adaptation and resilience to disaster. In addition, future studies could use a mixed method to explore immobility phenomena in different contexts. Eventually, in an increasing migration driven by climate change disaster, it will be important to understand how and why people remain to stay in disaster-prone areas and how this has an influence on their cultures and livelihood.

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## REFERENCES

- Abidin, H. Z., Andreas, H., Gumilar, I., Sidiq, T. P., Gamal, M., & Murdohardono, D. (2010). Studying Land Subsidence in Semarang (Indonesia) using Geodetic Methods. In *FIG Congress. Facing the Challenges – Building the Capacity Sydney, Australia, 11-16 April 2010* (pp. 1–15).
- Amin, C., Sukamdi, & Rijanta. (2019). Modeling (Im) mobility: the decision to stay in disaster prone area amongs fishermen community in Semarang. *E3S Web of Conferences*, 76, 03012.
- Amin, C., Sukamdi, S., & Rijanta, R. (2018). Exploring Typology of Residents Staying in Disaster-Prone Areas: A Case Study in Tambak Lorok, Semarang, Indonesia. *Forum Geografi*, 32(1).
- Arief, L. N., Purnama, B. S., & Aditya, T. (2012). Pemetaan Risiko Bencana Banjir Rob. *The 1st Conference on Geospatial Information Science and Engineering*, 1–12.
- Baláz, V., Williams, A. M., & Fifeková, E. (2016). Migration Decision Making as Complex Choice: Eliciting Decision Weights Under Conditions of Imperfect and Complex Information Through Experimental Methods. *Population, Space and Place*, 22(1), 36–53.
- Carling, J., & Schewel, K. (2018). Revisiting aspiration and ability in international migration. *Journal of Ethnic and Migration Studies*, 44(6), 945–963.
- Chang, I. Y., Jackson, S. J., & Sam, M. P. (2017). Risk society, anxiety and exit: A case study of South Korean migration decision-making. *Asian and Pacific Migration Journal*, 26(3), 328–351.
- Clark, W. A. V., Duque-Calvache, R., & Palomares-Linares, I. (2017). Place Attachment and the Decision to Stay in the Neighbourhood. *Population, Space and Place*, 23(2), e2001.
- Creswell, J. W. (2007). *Qualitative inquiry and research design: choosing among five approaches* (2nd ed.). California: Sage Publications, Inc.
- De Jong, G. F., & Fawcett, J. T. (1981). Motivations for Migration: An Assessment and a Value-Expectancy Research Model. In *Migration Decision Making* (pp. 13–58). Elsevier.
- De Jong, G., & Gardner, R. (1981). *Migration Decision Making. Multidisciplinary Approaches to Microlevel Studies in Developed and Developing Countries*. New York: Pergamon Press.
- Fischer, P. A., & Malmberg, G. (2001). Settled People Don't Move: On Life Course and (Im-)Mobility in Sweden. *International Journal of Population Geography*, 7(5), 357–371.
- Gomez, O. (2013). *Working Paper: Climate change and migration. A review of the literature*.
- Gray, C., & Mueller, V. (2012). DROUGHT AND POPULATION MOBILITY IN RURAL ETHIOPIA. *World Development*, 40(1), 134–145.
- Ifan R Suhelmi, & Hari Prihatno. (2014). Spatial Dynamic Model of Inundated area due to Sea Level rise at Semarang coastal Area. *Jurnal Manusia Dan Lingkungan*, 21(1), 15–20.
- King, R. (2012). *Theories and typologies of migration: An overview and a primer. Willy Brandt Series of Working Papers in International Migration and Ethnic Relations* (Vol. 3/12). Sweden.



- Lee, E. S. (1996). A Theory of Migration. *Demography*, 3(1), 47–57.
- Mabogunje, A. L. (1970). Systems Approach to a Theory of Rural-Urban Migration. *Geographical Analysis*, 2(1), 1–18.
- Marfai, M. A., & King, L. (2008). Coastal flood management in Semarang, Indonesia. *Environmental Geology*, 55(7), 1507–1518.
- Marfai, M. A., Almohammad, H., Dey, S., Susanto, B., & King, L. (2008). Coastal dynamic and shoreline mapping: Multi-sources spatial data analysis in Semarang Indonesia. *Environmental Monitoring and Assessment*, 142(1–3), 297–308.
- Marfai, M. A., King, L., Sartohadi, J., Sudrajat, S., Budiani, S. R., & Yulianto, F. (2008). The impact of tidal flooding on a coastal community in Semarang, Indonesia. *Environmentalist*, 28(3), 237–248.
- Massey, D. S., Arango, J., Hugo, G., Kouaouci, A., Pellegrino, A., & Taylor, J. E. (1993). Theories of International Migration: A Review and Appraisal. *Source: Population and Development Review*, 19(3), 431–466.
- Norris, R. E. (1972). Migration as Spatial Interaction. *Journal of Geography*, 71(5), 294–301.
- Raleigh, C., Jordan, L., & Salehyan, I. (2008). *Assessing the Impact of Climate Change on Migration and Conflict. The Social Development Department, The World Bank Group*. Washington DC: The World Bank.
- Ravenstein E. G. (1885). The Laws of Migration. *Journal of the Statistical Society of London*, 48(2), 167–235.
- Schewel, K. (2019). Understanding Immobility: Moving Beyond the Mobility Bias in Migration Studies. *International Migration Review*, 1(28), 019791831983195.
- Sell, R. R., & Dejong, G. F. (1978). Toward a Motivational Theory of Migration Decision Making. *Journal of Population*, 1(4), 313–335.
- Speare, A. (1971). A cost-benefit model of rural to urban migration in Taiwan. *Population Studies*, 25(1), 117–130.
- Stark, O., & Bloom, D. E. (1985). The New Economics of Labor Migration. *The American Economic Review*, 75(2), 173–178.
- Todaro, M. P. (1969). A Model of Labor Migration and Urban Unemployment in Less Developed Countries. *The American Economic Review*. American Economic Association.
- Todaro, M. P. (1980). Internal Migration in Developing Countries: A Survey. In Richard A. Easterlin (Ed.), *Population and Economic Change in Developing Countries* (pp. 361–402). Chicago: University of Chicago Press.
- Ureta, S. (2008). To Move or Not to Move? Social Exclusion, Accessibility and Daily Mobility among the Low-income Population in Santiago, Chile. *Mobilities*, 3(2), 269–289.
- Wolpert, J. (1966). Migration as an Adjustment to Environmental Stress. *Journal of Social Issues*, 22(4), 92–102.
- Zelinsky, W. (1971). The Hypothesis of the Mobility Transition. *Geographical Review*, 61(2), 219–249.