

Sustainable Gastronomy and Disaster Vulnerability in Majalengka District

*Dias Pratami Putri*¹, *Risya Ladiva Bridha*¹, *Hurry Mega Insani*¹, *Purna Hindayani*¹,
*Woro Priatini*¹, *Ilmiati Tsaniah*¹

¹Universitas Pendidikan Indonesia

Abstract. The study addressed sustainability and vulnerability in hazards in Majalengka District, focusing on the gastronomic sector. Sustainable gastronomy emphasizes environmental responsibility, social equity, and economic viability in food production until consumption. Sustainable gastronomic tourism is a crucial component of sustainable tourism development, but its durability may be compromised by a natural hazards. This study analyze the relationship between sustainable gastronomy and vulnerability to hazards in Majalengka District. The research involved mapping the distribution of culinary tourism places, vulnerability analysis, and stakeholder interviews. The method used is the Geographic Information System (GIS) method, assisted by the Global Positioning System (GPS), determine locations, with hazard data from INARISK. The results showed that the distribution of culinary tourism in Majalengka Regency is not always related to the level of vulnerability to natural hazards. The analysis revealed that gastronomic location is related to vulnerability to extreme weather disasters. Additionally, factors such as accessibility, risk planning and management, and community participation, play an important role in the sustainability of the gastronomic sector. This research is crucial for formulating sustainable tourism development strategies that consider hazard vulnerability, enhancing our understanding of sustainable gastronomic tourism's potential to mitigate and adapt to natural hazards in Majalengka Regency.

1 Introduction

Indonesia, with its rich cultural diversity and abundant geographical landscape, has strengthened its position as one of the top tourism destinations worldwide. However, what makes it even more stunning is how Indonesian cuisine has become an invaluable reflection of the country's cultural richness. Throughout the country, Indonesia offers a million mouthwatering flavours, creating a culinary heritage like no other.

As we explore Indonesia, we quickly realize that culinary is more than just food; it reflects the history, traditions, and identity of the community [1-2]. In Indonesian dishes, we find traces of past civilizations, with each spice and spice giving it a unique feel. In addition, the

natural ingredients that are abundant throughout the country enrich local dishes, creating an infinite palette of flavors.

However, Indonesian cuisine is also a reflection of a beautiful blend of past and present. With adaptation and innovation, traditional cuisine evolves alongside contemporary culinary trends, making Indonesia one of the important players in the global culinary scene. On this journey, Indonesian cuisine not only steals the hearts of travelers, but also touches the soul, embraces history, and celebrates priceless cultural diversity. So that typical food becomes gastronomic tourism that lives the culture in a region.

Indonesian gastronomy has long been recognized as one of the best in the world. The diversity of cuisine in each province and island makes Indonesia a paradise for food lovers. From spice-rich rendang [3-4] to delicious satay, from Balinese grilled fish to spicy Minang goulash soak, Indonesian dishes have captured the attention and hearts of international tourists.

Majalengka is one of the regencies in West Java. The ease of traveling to Majalengka Regency has been supported by access to the Cisumdawu TOLL Road which connects Majalengka Regency with major cities around it such as Bandung and Jakarta. Currently, Majalengka Regency is just starting to develop natural tourism and cultural tourism. So that makes tourists not too aware of the typical food of this district. So there is a need for gastronomic inventories which can support these natural and cultural tourism activities [5].

Sustainable tourism development requires disaster mitigation as an important component. The tourism sector is often vulnerable to various types of natural disasters such as earthquakes, floods, tsunamis, tropical storms, volcanic eruptions, and so on [6]. Disaster mitigation is a series of actions aimed at reducing the impact and risk of disasters and preparing tourism destinations to face disasters that may occur [7]. Gastronomic tourism is often the backbone of the local economy [8]. Effective disaster mitigation can more easily restore the local economy after a disaster, so that the livelihoods of local residents are not disrupted in a sustainable manner [9].

Achieving sustainable tourism development requires cooperation between the government, the private sector and local communities in planning, implementing and monitoring disaster mitigation strategies [10]. This includes the development of disaster-resistant infrastructure, training for emergency response, early warning, and an in-depth understanding of the characteristics of disasters in specific areas [11]. This approach, tourism can remain an important economic resource while protecting the natural environment and the safety of all parties involved [12].

Majalengka has various potential disaster hazards, so it needs to be mapped in the gastronomic tourism area. Geospatial information needs to be created for planning capital in disaster mitigation. Maps can provide interactive information regarding disaster-prone locations and areas [13], as well as related to gastronomic locations. Multi-hazard is a complex disaster study, but can provide information related to disasters and disaster mitigation efforts. Used to identify areas that are vulnerable to various types of disasters, such as earthquakes, floods, tropical storms, landslides, and so on. This helps in disaster planning and mitigation if geospatial information is provided [14].

The aim of this research is to map disaster vulnerability in gastronomic areas and locations in Majalengka, especially in gastronomy tourism, for sustainable development. Gastronomy is very Gastronomy and disaster are two concepts that can be related in several important ways. Geospatial information in the form of maps needs to be presented, as a planning effort for disaster mitigation in affected areas at gastronomic tourism development locations. Sustainable development certainly pays attention to disaster aspects such as gastronomic tourism. This research will be useful for studying gastronomic tourism in the disaster aspect.

2 Method

The research method used is a qualitative descriptive method with an observation and survey approach. The data used in this study is mapping the potential of gastronomic tourism in Majalengka Regency. With observation and survey methods, mapping of gastronomic tourism sites will be collected and analyzed according to system needs using QGIS or Arc GIS 10.4 software. As for location data: 1) Data related to the potential of gastronomic tourism in Majalengka Regency, 2) Data on coordinate points of gastronomic tourism locations in Majalengka Regency, 3) Address data for gastronomic tourism locations in Majalengka Regency. The disaster studied is multi-hazard which is available on INARISK BNPB which can be freely accessed via <https://inarisk.bnpb.go.id/>. Disaster parameters are visualized and analyzed based on gastronomic availability in the study area. The research location is in Majalengka Regency covering several sub-districts, namely Majalengka District, Cigasong District, and Maja District (Figure 1).

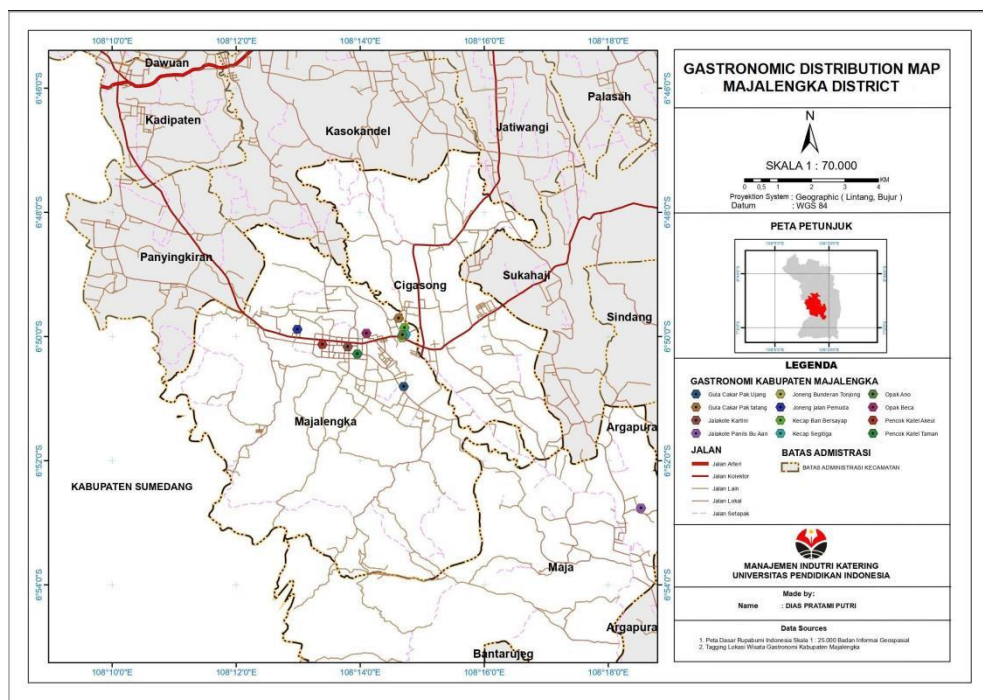


Fig. 1. Research Location

3 Result and Discussion

3.1. Gastronomic Development Location

Based on research, it was found that Majalengka has 11 gastronomic locations that can be developed in the tourism aspect. The gastronomy that covers Majalengka Regency is Gula Claws Pak Tatang, Jalakote Kartini, Jalakote Paniis Bu Aan, Joneng Bunderan Tonjong, Joneng Jalan Pemuda, Kecap Ban Bewing, Kecap Triangle, Opak Ano, Opak Beca, Pencok Katel Ateul, and Pencok Katel Taman. Locations for gastronomic tourism development are located in Majalengka District, Cigasong District, and Maja District.

3.1.1. Soy Sauce

Soy sauce has become a much-loved condiment in Indonesia, and Majalengka Regency in West Java is known as one of the main centers of soy sauce production. In Majalengka, there are several well-known soy sauce brands, including Kecap Segitiga and Kecap Ban Bersayap. The uniqueness of taste and high viscosity are the characteristics inherent in soy sauce from Majalengka. Even so, these local soy sauce products still face stiff competition from big brands such as Bango, ABC, and others in the market.

Although Majalengka's soy sauce has an unparalleled distinctive taste and appreciated viscosity, they still face fierce competition with big widely known brands such as Bango and ABC. Nevertheless, the existence of soy sauce from Majalengka still holds an important place in Indonesia's culinary heritage, reflecting culinary diversity and the richness of domestic culture that values and maintains local culinary traditions.

Established in 1958, kecap segitiga is so named because it was originally founded by three people, namely Mr. H. Lukman and his two brothers. However, until now only Mr. Lukman has continued the business. At first, this soy sauce was produced independently and offered door to door to neighbors around. As it turned out, many people liked it so much that demand increased. Initially, kecap segitiga soy sauce only had salty variations, but later medium sweet and sweet variations were added. Now, kecap segitiga comes in various packaging, both plastic and glass.

3.1.2. Gula Cakar

Gula cakar is a traditional square-shaped sweetener originating from Majalengka. The appearance of this claw sugar can be traced to around the 1960s. Usually, people in this region use gula cakar as a sweetness enhancer in drinks such as tea or coffee. Gula cakar has a characteristic red, hollow, and rectangular shape, like a cube. The name "gula cakar" was given because it has a rough surface, similar to a torn or scratched object, with clearly visible pores. Therefore, gula cakar also has excellent solubility in water, giving a unique sweet touch to traditional drinks in Majalengka. Making gula cakar is fairly easy with raw materials for granulated sugar, food coloring, baking soda and water. When boiling sugar should be constantly stirred until thick. When lifted, it will be put into a mold and cut into pieces after hardening. Currently, gula cakar in majalengka is still produced modestly and distributed to surrounding markets.

3.1.3. Pencok Katel

Pencok katel, one of the Sundanese specialties, is similar in some ways to karedok. This food is made from the shoots of soybean plants mixed with chili paste. Especially interesting, this Katel can only be found in Majalengka, because soybean shoots are specially planted in the region. Although there is no clarity about exactly when the katel cracker appeared, it is thought that its appearance occurred when people began to recognize soy sauce and began the cultivation of soybeans as raw material for making soy sauce. Since then, pencok katel has become one of the unique culinary that illustrates the creativity and richness of Majalengka's culinary culture.

3.1.4. Tumis Ampas Kecap

Majalengka's typical gastronomy has strong roots in the utilization of soy sauce production waste. Ampas kecap left over from the juice extraction process, namely soybean pulp, is processed into a nutrient-rich dish. One example of the resulting dish is stir-fried soy pulp.

The process of making *tumis ampas kecap* is very simple and can be done easily. In this way, the people of Majalengka have shown their creativity in reducing waste while creating delicious and nutritious dishes.

3.1.5. *Opak*

Opak, a type of snack that has become an integral part of Majalengka culinary, is estimated to have begun production in the 1970s. In Majalengka, there are two popular variations of *opak*, namely salted *opak* and sweet *opak*. Salted *opak* is made from ingredients such as cassava, starch, coriander, cayenne pepper, and sugar. This food is printed in banana leaves, then steamed and dried in the sun before finally fried until cooked. Meanwhile, sweet *opak* has different taste characteristics and is usually favored because of the distinctive sweetness produced. The main ingredients of sweet *opak* are sticky rice and coconut.

Opak production in Majalengka reflects local craftsmanship and tradition in processing simple ingredients into delicious dishes passed down from generation to generation. This food is also an important part of Majalengka's culinary history, and has become a favorite snack choice for locals as well as visitors who come to this area.

3.1.6. *Joneng*

Joneng is an abbreviation of "kejo Koneng" or in Indonesian means yellow rice. *Joneng* is a culinary that can be found at night. What distinguishes *joneng* from yellow rice in general is the side dishes that accompany eating *joneng*. Offal satay and potato satay complete with fried food and *bajigur*. *Joneng* is wrapped in banana leaves and topped with *serundeng* or fried onions. It is believed that *joneng* began to exist in the 1960s. First sold in the red light intersection area of Tonjong.

3.1.7. *Jalakote*

Jalakotek is a play on *jalangkote*, because it feels a bit uncomfortable with the words "jalangkote" sellers call it with the words *jalakote*. This snack began to be widely sold since the 2003s. The difference between *jalakote* and *jalangkote* in the filling. The filling of *Jalakote* is massed tofu.

3.2. Gastronomic Disaster Mitigation

3.2.1 *Multi-hazard Mapping*

Based on analysis and representation of INARISK data, Majalengka Regency has four types of disasters, namely landslides, floods, volcanic hazards and extreme weather. The gastronomic location is not completely in the disaster danger area (Figure 2). The danger of landslides spreads in the southern and eastern areas of Majalengka. This area is an area close to Mount Cermi, so it has steep slopes and has the potential for landslides. The danger of flooding is widespread in the northern area of Majalengka Regency. The condition of the northern area is a flat area where several locations are alluvial plains, so there is potential for flooding. The danger of volcanoes is in the eastern area of Majalengka Regency. This area is a volcanic landform, namely Mount Cermi, which is an active volcano. The majority of extreme weather hazards are in the northern and central areas of Majalengka Regency. Extreme weather is related to climatological factors, and mostly occurs in flat areas.

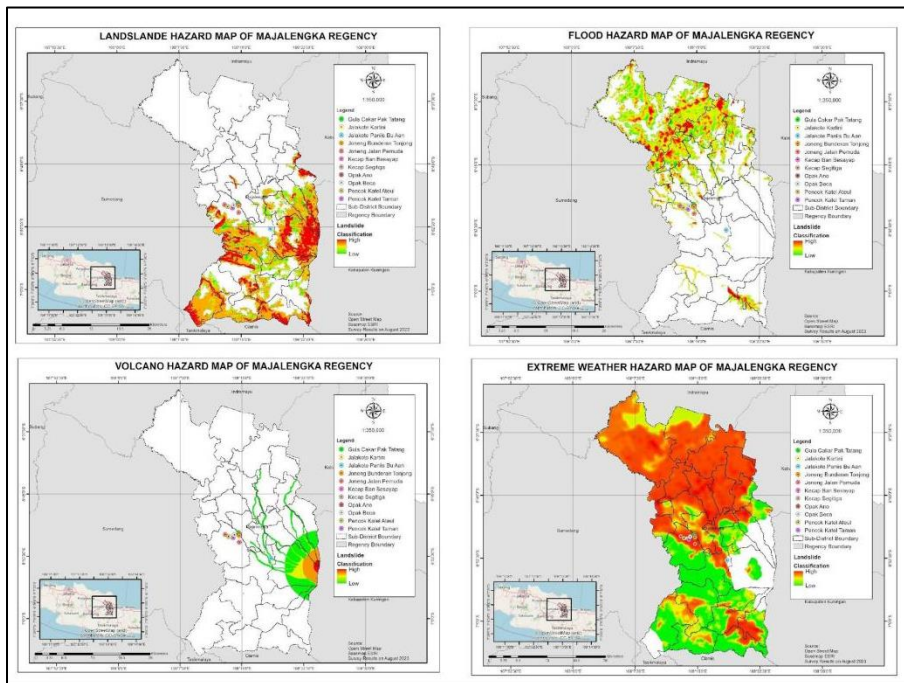


Fig. 2. Disaster Map in The Research Area

3.2.2. Gastronomic Location Disaster Mitigation

Spatial analysis shows that the majority of gastronomic locations are at risk of extreme weather disasters. The majority of the dangers of landslides, floods and volcanoes do not have an impact on gastronomic locations. Some locations, such as Jalakote Paniis Bu Aan, are almost in the volcano and landslide danger area, while the rest are almost near flood disasters, but not in the affected areas. Gastronomic locations in Majalengka Regency require extreme weather disaster mitigation. This condition is reflected in almost all locations that are at high risk of extreme weather.

Extreme weather disaster mitigation is an effort to reduce the negative impacts that can be caused by extreme weather. Extreme weather disaster mitigation involves a series of actions aimed at reducing risks, protecting people, property and the environment, and strengthening resilience to extreme weather. Some things that need to be considered in mitigating extreme disasters are as follows:

- **Risk Planning and Assessment:** Identify areas that are vulnerable to extreme weather, such as flood areas, earthquake zones, or areas at risk of tropical storms. Evaluate the potential vulnerability of people, property and the environment to extreme weather. Disaster risk analysis to understand the potential impacts and losses that may occur.
- **Weather Mapping and Information:** Building a reliable weather monitoring system to detect extreme weather and provide early warning to residents. Ensure that weather information is widely available and accessible to the public, including through social media and weather applications.
- **Disaster-Resistant Infrastructure:** Improving building construction to better withstand extreme weather, such as hurricanes and earthquakes.

- **Ecosystem Restoration:** Preserving and restoring natural ecosystems, such as forests can serve as a natural tool for mitigation during storms.
- **Emergency Planning:** Develop an emergency plan that details the action steps to be taken in the face of extreme weather, including evacuation, humanitarian assistance, and resource management.
- **Community Education and Awareness:** Provide training to communities on how to respond to extreme weather and follow early warnings. Increase awareness about the risks of extreme weather and the importance of disaster mitigation.
- **Appropriate Zoning and Spatial Planning:** Establish safe zones and avoid development in areas that are highly vulnerable to extreme weather. Develop spatial regulations that consider the risk of extreme weather.
- **Continuous Evaluation and Monitoring:** Continuously monitor and evaluate extreme weather disaster mitigation efforts to adapt and improve plans and actions according to changing conditions and extreme weather threats.
- **Risk Identification:** Conduct risk assessments to identify potential disasters that could affect gastronomic tourism areas, such as earthquakes, floods, fires and climate change.
- **Contingency Plan:** Develop a contingency plan that includes evacuation procedures, emergency communications, and post-disaster recovery.
- **Partnership with Government:** Work with government agencies to obtain the latest information and support during a disaster.
- **Collaboration with Local Communities:** Building relationships with local communities to improve disaster preparedness and response.

Mitigation of extreme weather disasters is an ongoing process and requires cooperation between the government, community and humanitarian organizations to minimize the negative impacts that can occur due to extreme weather.

4 Conclusion

Based on research, it was found that Majalengka has 11 gastronomic locations that can be developed in the tourism aspect. The gastronomy that covers Majalengka Regency is Gula Cakar Pak Tatang, Jalakote Kartini, Jalakote Paniis Bu Aan, Joneng Bunderan Tonjong, Joneng Jalan Pemuda, Kecap Ban Besayap, Kecap Triangle, Opak Ano, Opak Beca, Pencok Katel Ateul, and Pencok Katel Taman. The distribution of culinary tourism in Majalengka Regency is not always related to the level of vulnerability to natural hazards. The results of the analysis show that gastronomic location is related to the danger of vulnerability to extreme weather disasters. Spatial analysis shows that the majority of gastronomic locations are at risk of extreme weather disasters. The majority of the dangers of landslides, floods and volcanoes do not have an impact on gastronomic locations. Some locations, such as Jalakote Paniis Bu Aan, are almost in the volcano and landslide danger area, while the rest are almost near flood disasters, but not in the affected areas. Gastronomic locations in Majalengka Regency require extreme weather disaster mitigation. Other factors, such as accessibility, risk planning and management, and community participation, also play an important role in determining the sustainability of the gastronomic sector. This study has particularly significant implications for the formulation of sustainable tourism development strategies that take into account vulnerability to hazards. Furthermore, this research enhances our understanding of the potential of sustainable gastronomic tourism in mitigating and adapting to natural hazards in the Majalengka Regency region.

Reference

1. F. Sgroi, "Sustainability and culinary traditions? Understand the role of historical markets in the development of agri-food and local gastronomy from the perspective of behavioral economics," *International Journal of Gastronomy and Food Science*, vol. **34**, art. no. 100809, (2023).
2. B. S. Iskandar, B. Irawan, D. Mulyanto, J. Iskandar, A. Afinanda, B. Rajab, "Gastronomic ethnobotany of traditional vegetables among the Sundanese in rural West Java, Indonesia," *Biodiversitas*, vol. **24**, no. 7, pp. 3932-3950, (2023).
3. S. Fatimah, D. Syafrini, Wasino, R. Zainul, "Rendang lokan: history, symbol of cultural identity, and food adaptation of Minangkabau tribe in West Sumatra, Indonesia," *Journal of Ethnic Food*, vol. **8**, no. 1, art. no. 12, (2021).
4. F. Rahman, "Tracing the origins of rending and its development," *Journal of Ethnic Food*, vol. **7**, no. 1, art. no. 28, (2020).
5. D. P. Putri and Yulianto, "Gastronomy tourism of palm cabbage as a supporting tourism attraction in surrounding Tambing Lake," *Jurnal Kepariwisata*, vol. **21**, no. 2, pp. 187-196, (2022).
6. N. Wahyuningtyas, A. Tanjung, A. Kodir, H. Wijanarko, "Management of tourism areas based on disaster mitigation (case study of Senggigi Beach)," in *IOP Conference Series: Earth and Environmental Science*, vol. **412**, no. 1, art. no. 012015, (2020).
7. J. K. Newport and G. G. Jawahar, "Community participation and public awareness in disaster mitigation," *Disaster Prevention and Management: An International Journal*, vol. **12**, no. 1, pp. 33-36, (2003).
8. S. Ramadhan, E. Sukma, V. Indriyani, "Environmental education and disaster mitigation through language learning," in *IOP Conference Series: Earth and Environmental Science*, vol. **314**, no. 1, art. no. 012054, (2019).
9. M. Sosa, S. Aulet, L. Mundet, "Community-based tourism through food: A proposal of sustainable tourism indicators for isolated and rural destinations in Mexico," *Sustainability*, vol. **13**, no. 12, art. no. 6693, (2021).
10. Izharisyah, "Community social phenomenon as a preventive action and disaster mitigation of landslide disasters in Simalungun District," in *Proceeding International Conference On Language, Literature And Culture*, vol. **1**, p. 397, Feb. (2022).
11. A. Agustan and D. R. Kausar, "Towards a framework for disaster risk reduction in Indonesia's urban tourism industry based on spatial information," *Geographia Technica*, vol. **14**, (2019).
12. S. El Masri and G. Tipple, "Natural disaster, mitigation and sustainability: the case of developing countries," *International Planning Studies*, vol. **7**, no. 2, pp. 157-175, (2002).
13. L. A. Manfré, E. Hirata, J. B. Silva, E. J. Shinohara, M. A. Giannotti, A. P. C. Larocca, J. A. Quintanilha, "An analysis of geospatial technologies for risk and natural disaster management," *ISPRS International Journal of Geo-Information*, vol. **1**, no. 2, pp. 166-185, (2012).
14. A. Kawasaki, M. L. Berman, W. Guan, "The growing role of web-based geospatial technology in disaster response and support," *Disasters*, vol. **37**, no. 2, pp. 201-221, (2013).