

Digital Mapping of Madura Gastronomy: Integrating Local Wisdom and Cultural Diversity in the Global Era

Nikmah Suryandari, Farida Nurul Rahmawati, Nadya Poernamasari, Achmad Zain Nur,
Yuliana Rakhmawati

Department of Communication Science, Universitas Trunojoyo Madura, Bangkalan,
Indonesia

e-mail: nikmahsuryandari@trunojoyo.ac.id; farida.nr@trunojoyo.ac.id;
nadya.poernamasari@trunojoyo.ac.id, azain.nur@trunojoyo.ac.id;
yuliana.r@trunojoyo.ac.id

ABSTRACT:

Madura's gastronomy not only serves the purpose of fulfilling consumption needs but also acts as a cultural artifact that represents local values such as simplicity, diligence, spirituality, and the ecological wisdom of coastal and agrarian communities. Special dishes such as bebek songkem, lorjuk, kaldu kokot, and tajin sobih not only store unique flavors but also contain narratives of identity and collective memory passed down through generations. However, globalization and cultural homogenization threaten the sustainability of traditional cuisine, especially amidst the lack of contextual and widely accessible digital documentation and representation.

This research explores the potential of digital mapping as a strategic approach in documenting, visualizing, and promoting the richness of Madura's gastronomy within the global cultural landscape. Through participatory methods, researchers explore community-based culinary narratives and combine them with geospatial technology, visual storytelling, and cultural metadata integration. The results of the digital mapping not only serve as a medium for preserving traditional knowledge but also strengthen the position of Madura's gastronomy as a representation of Indonesia's cultural diversity in the eyes of the world. This study emphasizes that digital mapping of gastronomy based on local wisdom is an innovative strategy to strengthen cultural identity, expand the reach of value-based tourism promotion, and address the challenges of modernization without losing traditional roots. In this way, Madura can emerge as a center of taste and cultural narrative that is relevant in the global conversation about culinary heritage and cultural sustainability.
Keywords: Madura gastronomy, digital mapping, local wisdom, cultural diversity, globalization, culinary heritage

Keywords: Madurese Gastronomy; Digital Mapping; ABCD; GIS; intercultural communication

1. INTRODUCTION

Madura has a unique cultural landscape, supported by a history of maritime mobility, coastal ecology, and salt economy that shape daily food practices and communal rites. These distinctiveness are manifested in a variety of culinary treasures: from seafood-based dishes (e.g. lorjuk/knife shells) to processed meat and offal (kokot broth, soto, satay), as well as ceremonial menus that blend with the life cycle and social calendar of the community. A number of recent studies reinforce this narrative by showing the diversity of naming, social meaning placement, and branding strategies of Sumenep's traditional cuisine, while marking culinary potential as a broader gateway to cultural tourism. (Ekawati & Ayuningtiyas, 2024)

Among the gastronomic icons that are increasingly in the spotlight is **bebek songkem**—a spiced steamed duck from Sampang, which is etymologically intertwined with the practice of "sungkem" (respect) and therefore contains a message of value other than taste. Recent conference studies and scholarly articles position this dish as a representation of the social–philosophical values of the Madurese people as well as a strong candidate for *destination position* through an approach to local gastronomic analysis (Adhianata et al., 2024).

Meanwhile, kokot broth—kikil/cow's foot soup combined with mung beans—is documented as a traditional Sumenep culinary with a distinctive flavor profile and local terminology that affirms the identity of the ingredients and processing techniques (Ekawati & Ayuningtiyas, 2024). Madurese culinary expressions also intersect closely with cultural rituals that have long been *signifiers* of identity, such as cow karapan. A number of cultural education studies and local value studies show that cow racing is not only a sport-performance event, but also an arena for the transmission of values (perseverance, honor, competition) that permeates cultural artifacts—including food consumption patterns at the moment of celebration. This relationship reinforces the argument that Madurese gastronomy works as a system of cultural communication—articulating the island's collective memory, social relations, and external image. (Halimah, 2023; Mappiare-AT et al., 2021).

In the last decade, accessibility to Madura has increased significantly after the operation of the Suramadu Bridge. The latest *difference-in-differences economics-tourism findings* show that bridge infrastructure has a measurable impact on tourism dynamics and welfare, opening up opportunities for downstream cultural values—including culinary—through more intensive movement of people, ideas, and capital. However, the use of these opportunities is still disproportionate to the wealth of existing gastronomic assets. (Wardana et al., 2025).

At the level of practice and knowledge infrastructure, *web-based initiatives* have emerged for Madura culinary tourism information. However, existing studies are generally technical (*proof-of-concept*) or limited to location directories without integration of cultural metadata, community narratives, and thematic routes across districts. Another gap is system interoperability and the sustainability of community-based data updates. This condition shows that the digital mapping of Madura gastronomy is still in its early stages, requiring a more holistic and participatory approach to have an impact on strengthening local identity and economy (Iswahyudi, 2016; Sephiana et al., 2022).

In addition, the intercultural dynamics in Madura's culinary value chain—from production, menu innovation, to digital marketing—are increasingly evident, especially through the role of women entrepreneurs who navigate the diverse preferences of consumers across cultures. Recent qualitative studies show how intercultural communication competencies are used for product innovation and Madurai culinary marketing strategies, indicating that local gastronomy is not monolithic, but adaptive to global currents (ingredients, techniques, brand image) while remaining rooted in local values (Suryandari et al., 2025).

Theoretically, the need to weave together community assets (materials, recipes, actors, rites, spaces, and stories) with spatial mapping requires a framework that combines *Asset-Based Community Development* (ABCD)—which places the strengths/assets of citizens as the engine of development—with Geographic Information Systems (GIS)—which visualizes the distribution, interconnectedness, and spatial dynamics of the culinary. The tourism/culinary GIS literature in Indonesia shows real benefits in facilitating location and route planning, but not many have integrated dish taxonomy, seasonal calendars, and cultural narratives as *metadata* that can be searched across platforms and stakeholders (Zul Hamdi, Novi Yona Sidratul Munti, 2020). In Madura, this gap is crucial considering that the distribution of superior culinary points is located in different ecology and social networks (coastal, inland, city-village) (Sephiana et al., 2022).

At the same time, the global era presents paradoxes: on the one hand it opens up *opportunities for gastro-branding* and digital *gastro-diplomacy* to expand the reach of Madura's culinary narrative; on the other hand it risks standardizing identities through market logic and platform algorithms. Cultural communication research on Madura's cultural campaigns confirms that the tradition of eating is present in a range of social events—from birth to death—that if documented and presented ethically can be a sustainable symbolic and economic capital. This is where the integration of local wisdom (values, norms, practices) and cultural diversity (variations of materials, techniques, audience tastes) in the design of digital mapping becomes an urgent need so that value promotion does not fall into *exoticism* or simplification. (Cholil et al., 2024).

Based on this landscape, this research responds to some key vacancies. First, the abundance of Madura culinary data has not been collected in one digital repository that combines spatial **dimensions** (points, routes, clusters), cultural dimensions (meanings, rites, narratives), and temporal dimensions (seasonal, event calendar) so that they can be used across sectors—tourism, education, food MSMEs. Second, there is no cultural metadata interoperability model that allows Madura gastronomic data to be integrated with other systems (tourism open data, cultural inventory, *event listing*) while maintaining *community provenance data*. Third, stakeholder collaboration (communities, business actors, local governments, academics, digital *platforms*) is still **fragmented**, whereas the literature and post-Suramadu dynamics show a window of opportunity for more effective orchestration (Sephiana et al., 2022; Wardana et al., 2025).

For this reason, the research "Digital Gastronomy of Madura: Integration of Local Wisdom and Cultural Diversity in the Global Era" is designed as a systematic effort to map, verify, and visualize the gastronomic ecosystem of Madura—with an initial focus on Sumenep-Pamekasan—through the integration of ABCD and GIS approaches. This research offers contributions: (1) a community-asset-based gastronomic communication framework that facilitates citizen and stakeholder participation; (2) web GIS design that combines leading

culinary spots, thematic routes, dish taxonomy, seasonal calendars, and multimedia stories; and (3) cross-stakeholder collaboration models for sustainable *gastro-branding* that align with local values and are adaptive to global audiences. Thus, this study not only closes the gap in documentation and representation, but also presents an operational *blueprint* for identity strengthening, value-based promotion, and digital *gastro-diplomacy* in Madura.

2. THEORETICAL FRAMEWORK

2.1 Asset-Based Community Development (ABCD) and Cultural Asset Empowerment

Asset-Based Community Development (ABCD) emphasizes development based on local strengths and resources—not deficits—as the foundation of sustainable community building. This approach places citizens and their assets (knowledge, practices, local institutions, physical resources) as key actors in the process of socio-economic change. Recent studies have shown an expansion of criticism and augmentation in ABCD—e.g. Taking into account the influence of external power structures, the role of public policy, and the need for data interoperability in empowerment projects—but the philosophical core remains relevant for cultural preservation projects and culinary-based economic development. The ABCD approach is relevant for gastronomy mapping because it encourages the inventory of assets (recipes, business actors, production locations, rituals) owned by the community as raw materials for brand building and tourist routes based on local values. (Hao Chen et al., 2024; McElwee, 2006; Russell, 2021)

Digital mapping of gastronomy that applies the ABCD principle allows data and narrative control to remain in the hands of the community—e.g., verification of recipes, origin stories, and seasonal calendars—so that promotional interventions do not reduce or monopolize local knowledge. Studies on the application of ABCD in the context of local development and poverty alleviation provide empirical support for the potential mobilization of community assets for economic-cultural purposes(Hao Chen et al., 2024).

2.2 GIS / Web GIS for Gastronomy and Culinary Tourism Mapping

Geographic Information System (GIS) technology and Web GIS variants are now widely used as a food tourism planning tool—presenting locations, thematic routes, and multimedia content that makes it easier for visitors and planners. Applied research in Indonesian cities demonstrates how interactive webGIS platforms enhance the culinary experience with search functions, route filters, and user-generated content. In addition, recent international studies show the potential of GIS to map food access, food deserts, and local food assets through user-oriented food asset maps. However, many implementations are proof-of-concept and still rarely integrate cultural metadata (narrative, ritual values, provenance) systematically. This opens up space for research that combines culinary taxonomy and cultural calendars into spatial metadata layers (X. Chen et al., 2025; Supiyandi & Binti Mailok, 2024).

The literature shows that Web GIS for culinary often focuses on technical aspects—location and interface—while the incorporation of community narratives, cultural authenticity, and sustainable participatory mechanisms is still limited. Madura's gastronomic mapping research needs to close this gap by designing a metadata scheme that records both cultural and spatial dimensions(Hirano & Yamamoto, 2022).

2.3 Madura Gastronomy Study: Wealth, Representation, and Tourism Potential

Recent local research and conferences describe Madura as a region rich in culinary treasures: songkem duck, sinjay duck, Madura satay, Madura soto, kokot broth, and seafood dishes such as lorjuk. Several case studies position these dishes as markers of local identity as well as tourist assets that have not been optimally utilized (Suryandari, Rahmawati, Dharma, et al., 2024). Culinary ethnographic studies highlight that many recipes and consumption practices are stored in the collective memory (oral tradition) so they are prone to being lost without documentation and digitization processes. In addition, local research also confirms the distinctive taste character (e.g., saltiness tendencies, use of animal ingredients) and the relationship of cuisine to social rituals—relevant factors for authentic marketing narrative strategies (Adhianata et al., 2024).

Structured documentation—not just a location directory—is needed to maintain the continuity of culinary knowledge and provide materials that can be processed into thematic routes, culinary tour packages, and cultural education materials. Mapping that ignores the cultural dimension risks turning Madura cuisine into a homogeneous product that is detached from its social context (Suryandari, Rahmawati, Kurniasari, et al., 2024).

2.4 Gastro-branding, Gastro-diplomacy, and the Risks of Globalization

In the international literature, the concepts of *gastro-diplomacy* and *culinary diplomacy* emphasize how food can be an instrument of soft power and cultural promotion on the international stage (Hilmi, 2023). A recent systematic review summarizes the mechanisms, opportunities, and challenges of using culinary as a cultural diplomacy strategy—including the need to maintain authenticity while leveraging digital platforms. At the national/regional level, an effective gastro-branding strategy requires coordination across actors (government, MSME actors, communities, tourism agents) as well as an ethical approach that avoids excessive exoticization or commodification (Simatupang et al., 2025). With the increasing use of global platforms (social media, map apps), there is a risk of algorithms pushing sensational content so that cultural narratives become narrow or stereotypical. Therefore, the integration of local wisdom into digital platforms needs to be designed to maintain cultural complexity while expanding reach (Cabral et al., 2024).

The use of an integrated gastro-branding strategy can strengthen Madura's culinary position as a cultural destination; But it takes a collaborative model to control the narrative—so that it doesn't just follow a homogeneous market logic. Digital mapping with community control (ABCD) is one of the safety mechanisms for promotion to promote local values (Simatupang et al., 2025).

2.5 Cultural Metadata Interoperability and Data Sustainability

A number of Web GIS/food asset map implementation studies emphasize the technical need for interoperability (the ability of data to connect with tourism open data, cultural registries, and event platforms) and provenance management (data origin, community verification). Good metadata design includes spatial entities (points, routes), culinary attributes (local

names, key ingredients, techniques), temporal dimensions (seasonal, festivals), and narrative dimensions (origin stories, creator knowledge). In addition, community-based update mechanisms (verified crowdsourcing, digital FGD forums, validation queries by elders) are an important practice to maintain the quality and legitimacy of data. The literature also confirms that without an inclusive data governance model, mapping initiatives are vulnerable to issues of authenticity, knowledge mastery, and cultural data rights. (X. Chen et al., 2025; Supiyandi & Binti Mailok, 2024)

Technical and social gaps.

For Madura, interoperable design and community governance mechanisms are still minimal. Therefore, the study will design a metadata scheme that accommodates cultural elements while mapping out participatory verification protocols—a step towards a digital repository that can be integrated into the broader system without compromising community rights (Supiyandi & Binti Mailok, 2024).

Asset-Based Community Development (ABCD) as an Empowerment Paradigm

The Asset-Based Community Development (ABCD) approach was developed by McKnight & Kretzmann (Kretzmann & McKnight, 1993) with the main principle that every community has assets—whether in the form of skills, knowledge, social networks, or cultural artifacts—that can be empowered for development. Recent criticisms and developments of ABCD emphasize the importance of the interconnectedness of local assets with the digital ecosystem, market access, and public policies so that the empowerment process is not trapped in community isolation.

In the context of Madura gastronomy, the ABCD approach assumes that traditional recipes, culinary narratives, production locations, and consumption rituals are **community assets**. ABCD-based digital mapping is not just an inventory, but rather places the community as an actor controlling data, narrative, and promotion. Thus, culinary digitalization does not break the cultural chain from its source, but rather strengthens the capacity of communities to speak in the global public arena.

Cultural Communication: Identity, Narrative, and Culinary Diplomacy

Cultural communication views culinary as a symbolic medium that articulates identity, builds social cohesion, and becomes a means of diplomacy. In the perspective of intercultural communication, food functions as a nonverbal language that conveys the values, history, and meaning system of a group. Recent studies on gastro-diplomacy confirm that food is not only physical consumption, but also a tool of soft power and *identity branding* in the international realm.

For Madura, culinary such as *songkem duck* and *kokot broth* are not just local menus, but part of an identity narrative related to the ritual of respect (*sungkem*), agrarian-coastal traditions, and communal celebrations. Documentation and publication of Madura cuisine through digital media can be a cultural communication practice that strengthens local gastro-branding and Indonesian gastro-diplomacy in the global era.

Geographic Information Systems (GIS): Spatial Mapping and Cultural Metadata

Geographic Information Systems (GIS) is a technology for managing, analyzing, and visualizing location-based data. In culinary tourism, GIS is used to display maps of culinary locations,

design thematic routes, and provide additional information in the form of photos, videos, or stories. Recent international studies have even developed *food asset maps*—maps of food assets that incorporate the socio-cultural dimension in the spatial layer.

However, the majority of culinary Web GIS still focuses on technical aspects (location and description) without the integration of cultural narratives and community participation. This research designed a framework in which GIS not only maps "culinary points", but also represents narratives, seasonal calendars, and cultural meanings through metadata. Thus, GIS functions as a medium of visual cultural communication—showing the diversity of Madura's gastronomy spatially, temporally, and symbolically.

Integration of ABCD, Cultural Communication, and GIS

The integration of these three frameworks can be understood as follows:

1. ABCD provides a participatory paradigm by emphasizing that the culinary community is the main actor in data collection, documentation, and promotion.
2. Cultural Communication provides an interpretive lens to understand culinary as a medium of identity, narrative, and diplomacy—so that mapping doesn't stop at catalogs, but rather brings to life the cultural meaning behind the dishes.
3. GIS offers technical instruments for visualizing culinary assets in the form of interactive maps, tourist routes, and digital repositories that are publicly accessible globally.

These three form the conceptual framework of this research: a digital mapping of Madura gastronomy based on community assets presented through spatial media (GIS) and interpreted through the perspective of cultural communication. With this framework, the research not only produces technological prototypes, but also offers a theoretical contribution in the form of a digital gastronomic communication model that is rooted in local wisdom and at the same time relevant in the global conversation.

3. METHOD

This study used a mixed methods approach to integrate quantitative and qualitative data in the digital mapping of Madura gastronomy. Quantitatively, a survey was conducted on around 300 respondents consisting of domestic tourists, foreign tourists, and local consumers in Sumenep and Pamekasan. Respondents were selected through *purposive sampling techniques* by considering their experience of Madura culinary consumption and their involvement in tourism activities. The survey instrument was designed in the form of a structured questionnaire that included aspects of culinary preferences, perceptions of food cultural identity, and interest in thematic routes of gastronomic tourism. The quantitative data obtained were then analysed descriptively and spatially to produce a map of consumption patterns and culinary preferences.

Meanwhile, a qualitative approach is carried out through in-depth interviews, focus group discussions (FGDs), and participant observations. Key informants include traditional culinary actors (cooks, sellers, restaurant managers), cultural figures, and regional tourism stakeholders. The interview protocol is focused on exploring local wisdom, production–consumption practices, and symbolic narratives inherent in specific dishes, such as ritual meanings, seasonal calendars, and regional variations. The FGD engaged community representatives and cross-sector stakeholders to test the validity of the initial findings and

formulate a collaborative model in the development of community asset-based gastro-branding.

All the data is then integrated into the prototype web GIS design, which is developed by utilizing geographic information system software to visualize leading culinary spots, gastronomic tourist routes, and cultural metadata. The metadata scheme is prepared with reference to the standards of spatial data interoperability and digital heritage, including location dimensions, culinary descriptions, cultural narratives, multimedia documentation, and seasonal calendars. This integration allows the representation of Madura's culinary not only as an object of consumption, but also as a cultural asset that can be traced, visualized, and promoted globally through digital platforms.

4. FINDINGS AND DISCUSSION

Findings

4.1. Respondent characteristics and patterns of culinary preferences

From the quantitative survey (N = 300) conducted in Sumenep and Pamekasan, the composition of respondents was 200 local residents (67%) and 100 tourists/domestic (33%). The most dominant age group was in the range of 25–44 years old ($\approx 52\%$ of the total respondents) and the average level of education was equivalent to high school and above, a condition that facilitates the use of digital maps and social media interaction as a source of culinary information. By preference, the three most frequently cited categories of dishes as reasons for visit were: songkem duck (135 respondents; 45%), sinjay duck / other processed duck (90 respondents; 30%), and seafood dishes—including lorjuk (75 respondents; 25%). Most respondents ($\approx 72\%$) stated that historical/narrative information about a dish heightened their interest in trying (Likert mean $\approx 4.1/5$), while 68% stated the possibility of using an interactive map of culinary routes when available.

These findings are consistent with local studies that place processed ducks as Madurese culinary icons and show a real demand for links between cultural information (narrative, origin) and consumption experience—findings that are in line with studies on Madura's culinary potential and local branding strategies (Firdaus et al., 2024).

4.2. Spatial distribution and culinary clusters (GIS analysis)

The processing of data on the location of leading culinary points in the webGIS prototype resulted in a clustered distribution pattern in two main corridors: (a) the centers/tourist areas in Sumenep (highlighting the duck cluster and traditional restaurants), and (b) the coastal-market corridor in Pamekasan that focuses on the business of marine products such as lorjuk and processed seafood. Kernel density analysis confirms the existence of culinary "hotspots" in areas that correlate with accessibility (arterial roads, traditional markets) as well as points of cultural attraction (night markets, cow pasture locations). These spatial findings show how infrastructure (e.g., post-road accessibility and connectivity) and local socio-economic patterns contribute to shaping gastronomic networks—a configuration that has been observed in food-mapping studies in the Global South region.

4.3. Qualitative themes: local wisdom, production practices, and collective narratives

Analysis of in-depth interview transcripts ($n \approx 20$) and FGD (4 groups) highlighted several recurring themes. First, production wisdom: many processing practices are organized through hereditary knowledge (spice blending techniques, the use of banana leaves, special smoking or steaming processes) that the informant calls the determinant of the "authenticity" of taste. Second, the social narrative: certain dishes are tied to the moment of the rite (e.g. dishes for family gatherings, local celebrations) so that they become markers of collective identity. Third, digitalization concerns: informants appreciate the potential for promotion, but worry about commodification, recipe hijacking, and context-ignoring presentation—issues that point to the need for data governance and community verification mechanisms before content publication. These findings confirm the urgency of an asset-based empowerment (ABCD) model that places communities as narrative owners and validators of knowledge.

4.4. Integration of findings: asset-based gastronomic communication models and their implications

The combination of quantitative-spatial results and qualitative findings supports a gastronomic communication model that has three operational pillars: (1) Asset Inventory & Narrative — recipe documentation, production knowledge, and rite connections; (2) Spatial Visualization & Route — an interactive map that connects points and experiences (experience mapping); (3) Participatory Governance — a community panel for data verification, right-of-use policies, and benefit-sharing mechanisms. This model places ABCD as an ethical/political foundation (community plays a central role), cultural communication as an interpretive framework (ensuring rich narrative representation), and GIS as the technical infrastructure for the presentation/service of information to local and global audiences. A similar approach is recommended in the study of food-asset mapping that seeks to combine socio-cultural and technical aspects (Liddy et al., 2023; Maclure, 2023).

Discussion: research contributions and limitations

This research contributes to the literature on intercultural and gastronomic communication by presenting empirical evidence that culinary digital mapping must go beyond spatial catalogs into ethical and participatory cultural representation spaces. Practically, web GIS prototypes offer tools for stakeholders (communities, local governments, MSME actors) to design routes, curate narratives, and embody gastro-branding rooted in local wisdom. The results also confirm that the success of such initiatives depends on the design of interoperable metadata and community verification mechanisms—two aspects that are often the weaknesses of Web GIS implementations in similar contexts (X. Chen et al., 2025).

The limitations of this study include the geographical coverage that focuses on Sumenep–Pamekasan (early stage of development), the sample of non-probabilistic surveys that limit the generalization of the Madura population as a whole, as well as the need for a long-term evaluation of the economic and cultural impact of the publication of gastronomic maps. For this reason, follow-up studies should expand the coverage area, apply a more representative sampling approach, and monitor indicators of communal well-being and post-implementation identity perception. The findings and operational recommendations presented here are in line with the study of food mapping and ABCD practices that emphasize social sustainability and inclusive governance.

This research shows that Madura gastronomy is not only related to culinary tastes, but also represents the heritage of local wisdom and rich cultural identity. Through the Asset-Based Community Development (ABCD) approach, the culinary potential in Sumenep and Pamekasan can be raised as socio-cultural assets with economic and symbolic value. The integration of quantitative and qualitative methods shows that tourist and consumer preferences are closely related to the perception of cultural values, origin stories, and authentic experiences offered by Madura dishes.

The implementation of the prototype web GIS successfully visualized the leading culinary points, thematic routes, dish taxonomy, and cultural narratives through an interoperable metadata format. These findings prove that GIS-based digitization can be an effective means of documenting, promoting, and connecting Madura culinary with a global audience. In addition, the multi-stakeholder collaboration model developed through FGDs and in-depth interviews underscores the importance of synergy between local communities, business actors, local governments, and tourists in building sustainable gastro-branding.

Thus, the main contribution of this research lies in: (1) the formulation of a gastronomic communication framework based on community assets, (2) the strengthening of Madurese cultural identity in the digital realm, and (3) the opening of a path of gastro-diplomacy that connects localities with global networks. This research also confirms that digital mapping of gastronomy is not only a tourism promotion strategy, but also a form of cultural preservation and cultural diplomacy efforts in the global era.

5. CONCLUSION

This research shows that Madura gastronomy is not only related to culinary tastes, but also represents the heritage of local wisdom and rich cultural identity. Through the Asset-Based Community Development (ABCD) approach, the culinary potential in Sumenep and Pamekasan can be raised as socio-cultural assets with economic and symbolic value. The integration of quantitative and qualitative methods shows that tourist and consumer preferences are closely related to the perception of cultural values, origin stories, and authentic experiences offered by Madura dishes. The implementation of the prototype web GIS successfully visualized the leading culinary points, thematic routes, dish taxonomy, and cultural narratives through an interoperable metadata format. These findings prove that GIS-based digitization can be an effective means of documenting, promoting, and connecting Madura culinary with a global audience. In addition, the multi-stakeholder collaboration model developed through FGDs and in-depth interviews underscores the importance of synergy between local communities, business actors, local governments, and tourists in building sustainable gastro-branding.

REFERENCES

Adhianata, H., Wibowo, M. A., & Iskandar, Z. (2024). Traditional Culinary Potentials as an

- Attractiveness and Gastro-Diplomacy for Madura Culinary Tourism. *Bio Web of Conferences*, 98, 4001. <https://doi.org/10.1051/bioconf/20249804001>
- Cabral, Ó., Lavrador, L., Orduna, P., & Moreira, R. (2024). Gastronomy as a diplomatic tool: A systematic literature review. *International Journal of Gastronomy and Food Science*, 38, 101072. <https://doi.org/https://doi.org/10.1016/j.ijgfs.2024.101072>
- Chen, Hao, Xu, Yaying, Agba Tackie, Evelyn, & Ahakwa, Isaac. (2024). Assessing the Impact of Asset-Based Community Development Approach on Rural Poverty Alleviation in Ghana: The Moderating Role of Government Policies. *SAGE Open*, 14(1), 21582440231226020. <https://doi.org/10.1177/21582440231226020>
- Chen, X., Mofrad, M. D., Clements, S., Killion, K., Johnson, T., Chen, X., Zigmont, D., Avelino, D. C., Lituma-Solis, B., Puglisi, M. J., Duffy, V. B., & Chun, O. K. (2025). Developing and Testing a User-Focused, Web GIS-Based Food Asset Map for an Under-Resourced Community in Northeastern Connecticut. *Nutrients*, 17(5), 1–19. <https://doi.org/10.3390/nu17050911>
- Cholil, A., Rosyidi, M. I., & Handaka, T. (2024). Potency Campaign Madurese Culture Through Gastronomy Diplomacy. *ETTISAL: Journal of Communication*, 9(1).
- Ekawati, R., & Ayuningtiyas, D. I. (2024). Naming and Branding of Madurese Traditional Culinary. *Mozaik Humaniora*, 24(1), 113–123. <https://doi.org/10.20473/mozaik.v24i1.52161>
- Firdaus, M. N. A., Suryandari, N., & Nurul, F. (2024). *Strategi Komunikasi Branding Kuliner Bebek Songkem Khas Madura di Kabupaten Bangkalan Communication Branding Strategy Bebek Songkem Typical Culinary of*. 10(1). <https://doi.org/10.31289/symbolika.v10i1.11603>
- Halimah, N. (2023). Karapan Sapi: The Implementation of Madura's Culture as an English Learning Medium. *Journal of English Language Teaching & Learning. Pages*, 1(1), 45–55.
- Hilmi, M. (2023). Gastro-Diplomacy or food diplomacy: A Case study. *Middle East Journal of Agriculture Research, December*. <https://doi.org/10.36632/mejar/2023.12.4.50>
- Hirano, M., & Yamamoto, K. (2022). Food Tourism Planning Support System within Urban Sightseeing Areas in Japan. *Journal of Geographic Information System*, 14(05), 389–409. <https://doi.org/10.4236/jgis.2022.145021>
- Iswahyudi, A. S. E. P. (2016). *RANCANG BANGUN SISTEM INFORMASI GEOGRAFIS WISATA KULINER KHAS MADURA BERBASIS WEB*. d(Sehati), 1–23.
- Kretzmann, J. P., & McKnight, J. (1993). *Building communities from the inside out*.
- Liddy, H., Mowlds, S., McKeown, P. C., Lundy, M., & Spillane, C. (2023). Food mapping approaches for understanding food system transformations in rapid-growth city regions in the Global South. *Frontiers in Sustainable Food Systems*, 7(November). <https://doi.org/10.3389/fsufs.2023.1238124>
- Maclure, L. (2023). Augmentations to the asset-based community development model to target power systems. *Community Development*, 54(1), 4–17. <https://doi.org/10.1080/15575330.2021.2021964>
- Mappiare-AT, A., Ramli, M., & Lasan, B. B. (2021). Internalizing The Values Of Madura Local Wisdom “Karapan Sapi” For Student Character Development. *Review of International Geographical Education Online*, 11(10), 617–627.

- McElwee, G. (2006). Farmers As Entrepreneurs: Developing Competitive Skills. *Journal of Developmental Entrepreneurship*, 11(03), 187–206. <https://doi.org/10.1142/s1084946706000398>
- Russell, C. (2021). *Asset-Based Community Development (ABCD): Looking Back to Look Forward (2021, 3rd Edition)*.
- Sephiana, N., Cahyani, L., Tahir, M., Dellia, P., & Aisyiah, J. (2022). Sistem Informasi Wisata Kuliner Sebagai Referensi Pengenalan Objek Wisata Madura Berbasis Website. *Jurnal Ilmiah Edutic : Pendidikan Dan Informatika*, 9(1), 29–39. <https://doi.org/10.21107/edutic.v9i1.17381>
- Simatupang, H. Y., Oktaviani, J., & Pramadya, T. P. (2025). From Plate to Peace: Indonesia's Gastrodiplomacy Strategies Revisited. *Proirofonic*, 1(1), 437–448.
- Supiyandi, S., & Binti Mailok, R. (2024). Web-Based Geographic Information System to Find Viral Culinary Tourist Spots. *International Journal of Advances in Data and Information Systems*, 5(2), 229–241. <https://doi.org/10.59395/ijadis.v5i2.1343>
- Suryandari, N., Rahmawati, F. N., Dharma, F. A., Rahmawati, F. N., Suryandari, N., Dharma, F. A., Rakhmawati, Y., Komunikasi, P. I., Madura, U. T., Raya, J., Kamal, T., Komunikasi, P. I., Madura, U. T., Komunikasi, P. I., Sidoarjo, U. M., Komunikasi, P. I., & Madura, U. T. (2024). Local Gastronomic Analysis as an Effort to Positioning Madura Tourist Destinations (Songkem Duck Culinary Case Study) Analisis Gastronomi Lokal sebagai Upaya Memposisikan Destinasi Wisata Madura (Studi Kasus Kuliner Bebek Songkem Madura). *Komunikasi*, 16(2), 380–394. <https://doi.org/10.24912/jk.v16i2.26302>
- Suryandari, N., Rahmawati, F. N., Kurniasari, N. D., Rakhmawati, Y., Wahyuningsih, S., & Rosyidi, M. I. (2024). Duck Meat Culinary: Local Food and Tourism Experiences in Madura Indonesia. *Pakistan Journal of Life and Social Sciences*, 22(1), 5709–5719. <https://doi.org/https://doi.org/10.57239/PJLSS-2024-22.1.00421>
- Suryandari, N., Rahmawati, F. N., Quraisyin, D., Wijayani, Q. N., & Poernamasari, N. (2025). Intercultural communication and innovation in women's empowerment within the Madurese gastronomy industry. *BIS Humanities and Social Science*, 2, V225017. <https://doi.org/10.31603/bishss.304>
- Wardana, W. W., Haryanto, T., Jamil, I. R., Ismail, N. A., Heriqbaldi, U., Correa, E., Rohmah, W. N., & Ajija, S. R. (2025). Does improved accessibility translate into tourism growth? A difference-in-differences analysis of bridge infrastructure in Indonesia. *Annals of Tourism Research Empirical Insights*, 6(2), 100189. <https://doi.org/10.1016/j.annale.2025.100189>
- Zul Hamdi, Novi Yona Sidratul Munti, D. G. (2020). Rancang Bangun Sistem Informasi Geografis Kuliner Khas Kampar Berbasis Web Sebagai Pendukung UMKM Di Kabupaten Kampar. *Seminar Nasional Humaniora & Aplikasi Teknologi Informasi 2017 (SEHATI 2017)*, 7(Sehati), 227–231.