Regional Case Study

WEB GIS: The Promotion Model of Ngerangan Tourist Village in Klaten Regency through The Sustainable Rural Tourism Context During The Covid-19 Pandemic

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Abstract

The application of large-scale social restrictions (LSSR) during the Covid 19 pandemic in Indonesia significantly impacted the tourism sector. A Sustainable Rural Tourism model is expected to develop tourist village development during the Covid 19 pandemic through the WEB GIS (Website Geographical Information Systems) approach. It creates smart tourism through tourist information systems integrated with tourist websites. Ngerangan Tourist Village in Klaten Regency is a village where most of the population's economy is dependent on MSME (Micro, Small, and Medium enterprises) and farming activities. The research aims to formulate a tourism promotion model in Ngerangan tourism village through WEB GIS. The method used is quantitative. First, identifying the data needs such as spatial data (tourist attractions, tourist safety routes types, and infrastructure for implementing health protocols) and non-spatial data (information on MSME and virtual tours). Second, designing the tourism promotion system through WEB GIS and third, testing to see the output of the WEB GIS produced. The research output is Web GIS using story maps application contains two spatial information about the Ngerangan tourist village. First, spatial information about tourist attractions includes locations, photos, and descriptions of tourist attractions. Second, spatial information regarding health protocols facilities during the Covid-19 pandemic includes locations, photos, and descriptions of health protocol facilities.

Keywords: Web GIS; pandemic covid-19; tourism

1.   Introduction

The COVID-19 pandemic sweeping the entire world, including Indonesia, has become a disaster and has changed people's lives (Mahardhini, 2020). Restricting community activities is a way to break the COVID-19 chain, impacting economic activity, including the tourism sector (Respatiningsih et al., 2020). Tourist attractions are considered spaces that can bring crowds and are prone to COVID-19 transmission (Yudhiantoro and Pujiastuti, 2015). The tourism sector has been most affected by the Covid-19 pandemic. It is due to social restrictions, reduced transportation for tourists, and tourist demand in the context of tourism. By 2020, international tourism will fall by 80%. Tourism is experiencing a massive crisis such as health, finance, and nature, which threatens the existence of the demand side of tourism. In addition, it also affects social and economic changes in the tourism sector. Tourism losses due to the Covid-19 pandemic affect all actors in the tourism chain. It starts from the existence of a destination, providing tourist services (such as airlines) (Utkarsh and Sigala, 2021; Henseler, Maisonnave and Maskaeva, 2022; Li et al., 2022; Park, Kim and Kim, 2022). The reduction in the number of local and foreign tourists is very significant. According to the "World Travel and Tourism Council," the losses experienced by Indonesia since January from the tourism industry are approximately 1.5 billion US dollars (Phillipson et al., 2020; Ferdiansyah et al., 2020).

The COVID-19 pandemic has tremendously impacted the international and local tourism industry with travel restrictions, especially long-distance travel, social restrictions, and quarantines, which have led to a continued decline in the number of tourist arrivals resulting in huge losses. The impact of the lockdown imposed in several countries has had a socio-cultural, psychological, and economic impact on the stakeholders in the tourism world. Many tourists cancel their trips due to fear of contracting the COVID-19 disease that may occur during their travels. The impacts are the behaviour and psychology of tourists, greatly influencing the recovery of tourism and the perspective of market demand for tourism. Therefore, there is the concept of tourism resilience during the Covid 19 pandemic. Tourism needs a resilience approach because it provides a systemic perception to overcome the difficulties during the Covid 19 pandemic. Tourism sustainability can facilitate to adapt, response, and process evolution gradually. It is hoped that tourism will have tourist destinations that can absorb the shocks of the pandemic and continue to operate so that it can survive without reducing activity and adjusting the flow of tourism. This tourism survival has the essential ability to maintain tourist demand during the Covid-19 pandemic (Abbas et al., 2021; Huang et al., 2021; Lakshmi Singh et al., 2021; Santos and Oliveira Moreira, 2021; Tsui et al., 2021; Duro et al., 2022). Including the impact on the existence of tourist villages, where they can improve their economy and community capacity such as household businesses, homestays, culinary arts, and become tour guides (An and Alarcón, 2020). A survey conducted by the Tourism Village Institute on the impact of the COVID-19 outbreak on the condition of the community in tourist villages showed that all tourist villages as respondents had closed their tourism business activities (Dwina, 2020).

Therefore, tourism during the Covid 19 pandemic through the concept of Sustainable Rural Tourism is expected to manage tourism in a sustainable manner such as the local economy, maintaining cultural values, and environmental conservation (Bramwell, 1994; Anggraheni, Hermawan and Sujarwoto, 2018; Carr, 2020; Polukhina et al., 2021). The sustainable rural tourism approach during the COVID-19 pandemic through smart tourism (Mugauina et al., 2020; Moreno-Luna et al., 2021). The challenge in creating tourism resilience is about sustainable tourism. In sustainable tourism, it is necessary to develop tourism products that must continue to improvise and adapt to changes in tourism market demand. It impacts the sustainability of local products as tourism commodities (Goh, 2021; Mach and Ponting, 2021). The context of tourism sustainability is realized in the form of a Smart Tourism Destination (STD). STD can restore tourism quickly while ensuring the health of tourists and residents. This STD idea is related to

implementing information technology in tourist destinations such as entrepreneurial innovation, collaborative social capital, availability and allocation of resources, quality of life, and movement of human resources. STD can communicate tourism actors with tourists to create adaptive governance. STD is a modern technology infrastructure that provides functions related to universally promoting destinations, facilitating interaction with tourists, enhancing the travel experience, and improving residents' quality of life. The scope of this STD is in the form of governance, innovation, technology, sustainability, and accessibility (Casado et al., 2021; Bulchand-Gidumal, 2022). The implementation of STD in village tourism is through Smart Rural Tourism. Smart Rural Tourism aims to improve the socio-economic welfare of villagers through a sustainable tourism industry by applying appropriate technology. In Smart Rural Tourism, the role of the internet is vast because it is an essential factor in accelerating the economic growth of rural tourism through e-commerce. The role of internet technology can help businesses integrate the development of tourist demand trends (Zhu and Shang, 2021a). Internet technology has implications for the tourism industry that uses technology such as web 2.0 and virtual reality tours (Qiu et al., 2021). Internet technology through social media is considered very efficient in reducing the impact of the COVID-19 pandemic on the tourism sector. The hope is that social media can serve as an efficient and affordable tourism marketing tool. Digital and social media represent platforms to engage tourists as consumers offering freedom of time and location, actuality, and broad reach in tourism marketing (Pachucki et al., 2022).

In e-tourism, the tourism web concept is the primary source of information for planning a tourism trip in obtaining information about tourist travel destinations using devices such as mobile phones, tablets, and so on (Noguera et al., 2012). One of the technological tools in the application of e-tourism is a Geographic Information System (GIS). GIS is a tool that helps provide tourism management by analyzing integrated spatial and non-spatial data. GIS also functions in the tourism decision-making process where tourists get an overview of attractions, service products, and marketing in tourism. GIS capacity in tourism is related to several things such as inventory of tourism resources, identification of tourism development sites, measurement of the impact of tourism existence, management of tourist visitors, and assessment of potential impacts of tourism development (Bíl, Bílová and Kubeček, 2012; Albuquerque, Costa and Martins, 2018). In integrating GIS technology in tourism development related to the internet of things. Web GIS through google maps, yahoo maps, and other applications helps to provide travel information spatially to tourists. Its existence greatly influences tourism development, especially during the Covid 19 pandemic. Web GIS integrating story maps and WWW interactions can produce an intrinsic interaction that is more attractive to tourists in finding information about tourist destinations (Chang and Caneday, 2011). Web GIS is a media for developing geographic information system technology, resource management applied, and environmental management of an area based on internet technology (Yan and Wang, 2011; Satoto et al., 2012; Hermawan and Iriani, 2013; Suwirmayanti, 2015; Kong, 2017; Mertha et al., 2019; Santynawan et al., 2019; Nugraha et al., 2020). The support of story maps and web builder applications can help manage tourist data to be informative by simultaneously presenting various kinds of media (Antoniou et al., 2018). It can help promote tourism by prioritizing interactive users using spatial data on the website (Patton, 2014; Fu Pinde, 2015; Mdleleni et al., 2020). The research aims to formulate intelligent tourism through the WEB GIS information system as a digital promotional media needed by the Ngerangan Tourism Village in Klaten Regency. Designing Web GIS with story maps and web builder applications can create Sustainable Rural Tourism in the Ngerangan Tourism Village that is responsive and adaptive to the COVID-19 Pandemic.

2.   Methods

The study area is the Ngerangan Tourist Village in Klaten Regency. It became an icon of the Angkringan development in Central Java, as seen in Figure 1. The history of the villagers as Angkringan sellers since the 1980s. Around 600 families out of 1,900 families depend their fortunes on selling Angkringan. The problems faced are sustainability of the tourism aspect. There is still no development of digitalization as a form of adaptation to the COVID-19 pandemic. The attractions displayed and infrastructure support are still very minimal, where they are still limited to relying on what the community has. There are still many potential tourist attractions, including the nature and social culture of the community.
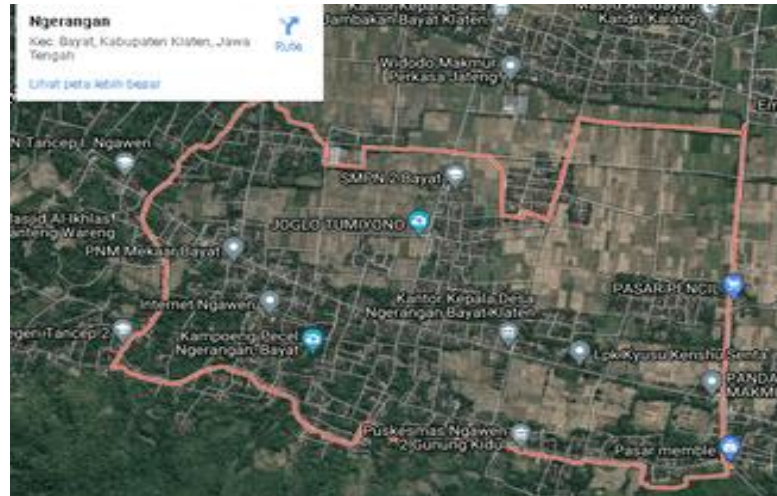

Figure 1. The study area of Ngerangan tourist village

The research method used is quantitative with an analytical tool in Web GIS. The software support used is a Web Builder (WordPress) and a GIS application (story maps). WordPress as a web builder is a plugin that features creating web GIS consisting of images, buttons, icons, grid, and video. While the story maps, a GIS application is Story Maps is an online-based application for storytelling with interactive maps. The following are the stages in how WordPress and story maps work in generating Web GIS. There are three stages of compiling a web GIS: input, process, and output. For more details on the process, see Figure 2.

In Figure 2, "Input" is the spatial data needed as a tourism database at the study location. The database is in the form of tourist attraction locations, health protocol facilities locations, and tourist attraction information. The database in the input process is then processed using story maps. In this stage of the story maps process, the database in the input process will be processed and presented in an integrated manner with the WWW. The stages of the process of compiling a GIS web there are three stages. They are first compiling the layout of the story maps design, followed by the mapping of attraction and health protocol facilities location so that a web GIS is produced in the form of attraction and health protocol facilities. They were second, connecting with a link between a web GIS in the form of attraction and health protocol facilities with a website design framework to produce output in the form of a website of Ngerangan tourist village. The last stage is to do the domain and hosting of the web GIS generated to produce output in the form of www.desangerangan.wordpress.com.
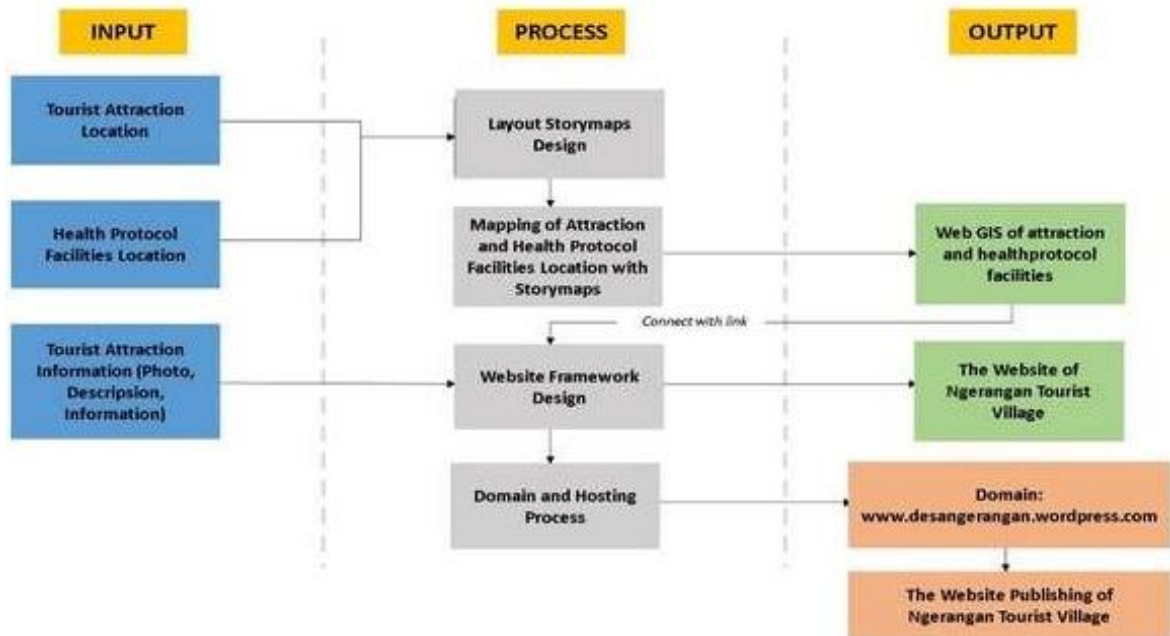
Figure 2. Analysis stages of research

The data form is tables, maps, and statistics. The data requirements are documentation data, tourist attraction locations, tourist attraction entrance tickets, tourist operating hours, road network maps, types of health protocol facilities, distribution locations of health protocol facilities, tourist demographics, number of tourists, and tourist locations. There is a Data Flow Direction (DFD) in compiling the Ngerangan Tourism Village Web GIS with a GIS application in the form of Story Maps and a Web Builder application in WordPress. DFD explains the operational flow process on the Ngerangan Tourism Village GIS web. There are several stages in operating the web GIS. Administrators from stakeholders managing the Ngerangan Tourism Village will provide display information on the web in the form of tourist attraction information, tourist route information, and health protocol facilities integrated with the GIS system as a promotional medium for Ngerangan Tourism Village. Then users in the form of tourists will access the tourist information by providing testimonials, origin location, and age gender to provide feedback on the tourist information they have obtained. In accessing the GIS web between administrators and tourists at the Ngerangan Tourism Village, tourist information data will be collected into a tourism database. The database includes location documentation, tourism attraction location, tourism admission ticket, tour operating hours, road infrastructure, health protocol facilities, distribution location of health protocol facilities, tourist demographics, number of tourists, and tourist origin location. For more details regarding DFD in compiling the Ngerangan Tourism Village GIS Web, see Figure 3.
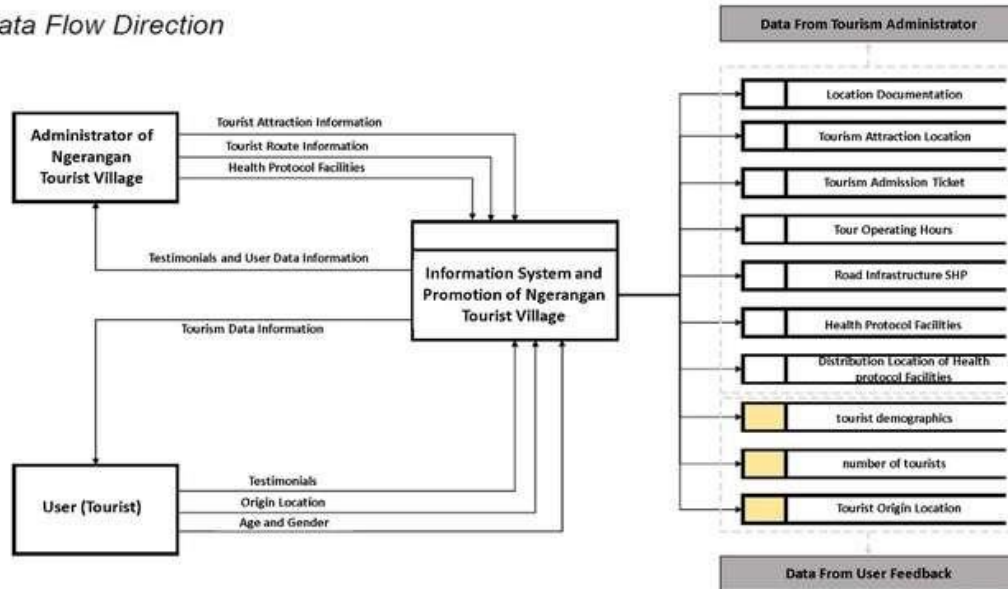
Figure 3. Data Flow Direction (DFD) of Ngerangan Tourist Village Web GIS

3. Result and Discussion

Web GIS development as a digital media for promoting Ngerangan Tourism Village provides essential information and can interact with users through spatial data. Web GIS application is the geographic information system that works with the internet (Chang and Caneday, 2011; Yang, 2016; Albuquerque, Costa and Martins, 2018; Zhu and Shang, 2021b). Web GIS is also working with WWW (World Wide Web) as client applications. The aim is to provide more detailed information to users as potential visitors. The following is a Web GIS framework for developing digital media for the promotion of the Ngerangan Tourist Village in figure 4:
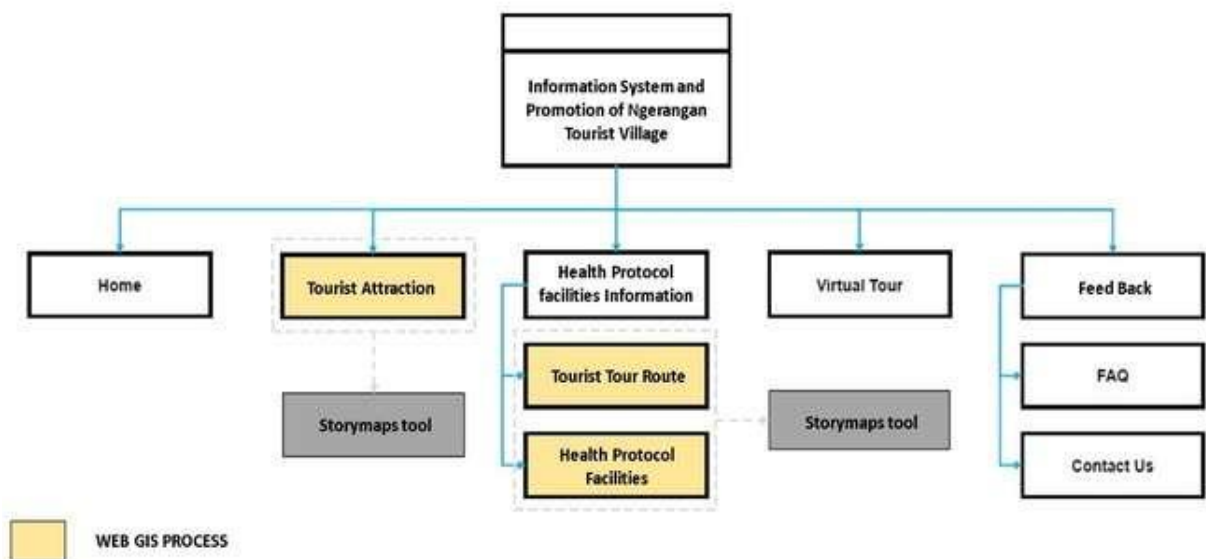

Figure 4. The Web GIS framework of the Ngerangan tourist village promotion model

In preparing Ngerangan Tourist Village Web GIS, a user interface design is needed as a basic pattern for making the system design. This input-output design helps know the basis for displaying a web-based geographic information system on digital promotion media for the Ngerangan Tourism Village. Here is how the home page looks on a web builder with WordPress in figure 5:

Figure 5. The homepage display of the website Ngerangan tourist village

The story maps application used to prepare the Web GIS of the Ngerangan Tourist Village provides essential information related to the tourist attractions. The story maps provide information about tourist attractions in the Ngerangan Tourist Village. A Tour Map layout provides information on the location of tourist attractions and an overview of tourist attraction documentation, complete with a description of the information. Users can find out the physical orientation of tourist attraction locations, get detailed information on tourist attractions, and provide documentation to provide a visual picture. The following is a display of story maps with information about tourist attractions in the Ngerangan Tourist Village can be seen in figures 6, 7, 8 and 9:

Figure 6. The homepage displays tourist attractions on the Ngerangan website (source: https://storymaps.arcgis.com/stories/5e4a3cdac75744038fb3d2ebc89e9f90).

Figure 7. The homepage display of tourist attraction "Museum Sejarah Angkringan" in Ngerangan village using Story Maps application - describes information about the attractions served in A*ngkringan* business education in history, A*ngkringan* tools, types of tea used, and culinary A*ngkringan*

Figure 8. The homepage display of the tourist attraction "Kampoeng Seni Budaya" in Ngerangan village using Story Maps application - Describe information about the attractions presented in art and culture education that carries elements of local wisdom in Ngerangan Village

Figure 9. The homepage display of tourist attraction "Kampoeng Loempang" in Ngerangan village using Story Maps application - Describe information about the attractions served in traditional culinary thematic villages in the form of *Sego Tiwul.*

Based on the results of processing tourist attraction data with the application of story maps and word press in the Ngerangan Tourism Village, it can be seen that the location of tourist attractions, information about tourist attractions, and some documentation of tourist attractions can be displayed in spatial to provide a complete picture for tourists in exploring the website. It is very effective during the COVID-19 pandemic, inviting tourists to identify the existing tourism potential to become an attraction in tourism promotion. Story maps and word press as digital promotional media can provide accurate spatial information and details that are expected to invite tourists to explore with a virtual tour menu. In providing information related to health protocol facilities, the function of the Story maps application with a cascade layout can provide information spatially to tourist users. The information is documentation of health protocol facilities and a benefit description of the function of health protocol facilities in preventing the transmission of Covid 19 in public spaces such as tourist attractions. Users can find out the physical orientation of the location of the health protocol facilities in the Ngerangan Tourist Village and get detailed information and documentation to provide a visual picture. In addition, information on how to use it is also informed in the story maps that have been made. The following is a display of story maps on information regarding health protocol facilities in the Ngerangan Tourism Village can be seen in Figures 10, 11, and 12:

Figure 10. The homepage displays health protocol facilities in Ngerangan village using the Story Maps application (source: https://storymaps.arcgis.com/stories/5e4a3cdac75744038fb3d2ebc89e9f90).
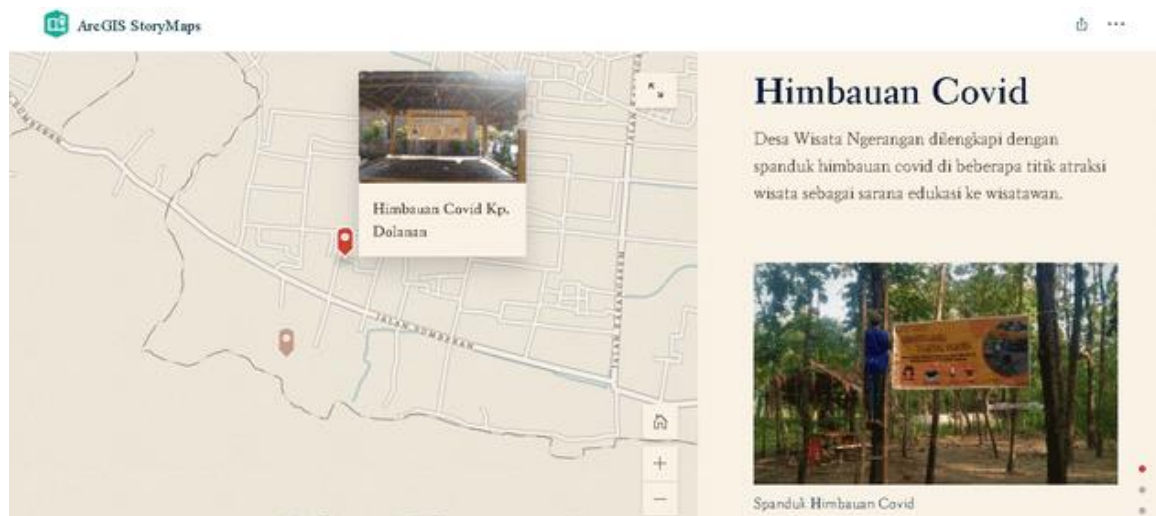

Figure 11. The homepage display of health protocol facilities "Himbauan Covid" in Ngerangan village using Story Maps - Describe information about the means of providing covid appeals in the form of banners installed at every point of the location of tourist attractions.
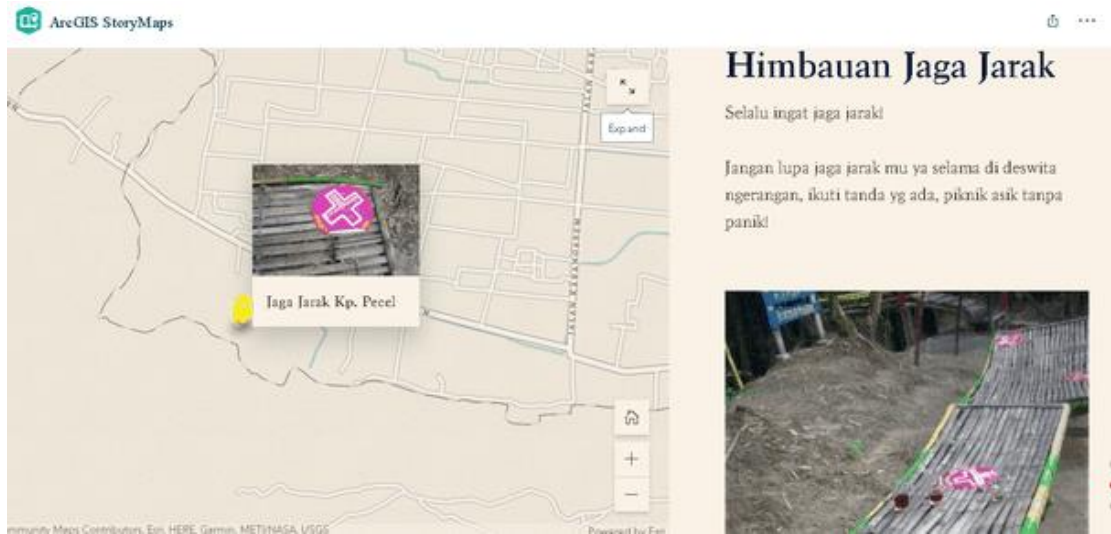
Figure 12. The homepage display of health protocol facilities "Himbauan Jaga Jarak" in Ngerangan village using Story Maps - Describe information about providing social distancing advice in the form of banners and signage installed at each point of the location of tourist attractions.
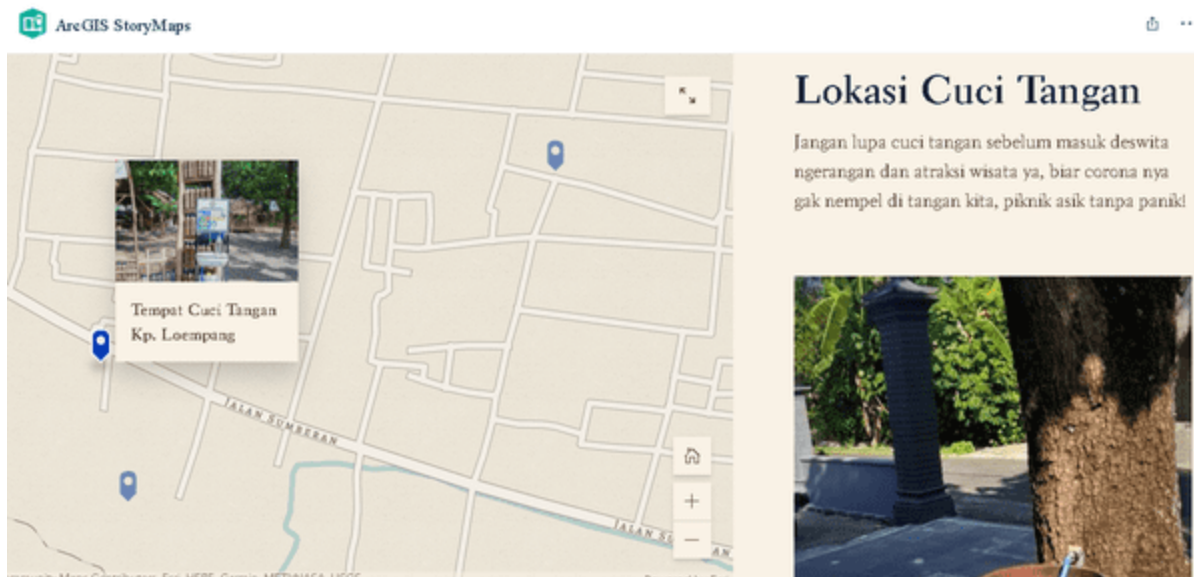

Figure 13. The homepage display of health protocol facilities "Lokasi Cuci Tangan" in Ngerangan village using Story Maps - Describe information about facilities for providing handwashing advice in a portable sink and a 60-second handwashing information banner installed at every tourist attraction location.

Based on the results of Web GIS analysis on information on health protocol facilities, story maps and word press can provide location orientation in the form of placement points for health protocol facilities in the Ngerangan Tourism Village. It will make it more accessible for tourists to find the health protocol facilities. In addition, tourists, when visiting this website, can read important information about health protocol facilities, including how to use them to prevent the transmission of covid 19 in the Ngerangan Tourism Village. Therefore, spatially it can provide good information about the health protocol facilities owned by the Ngerangan Tourism Village to attract tourists and make them feel safe travelling.

4. Conclusion

Web GIS through Story maps as a GIS application and Word press as a web builder can create smart tourism in the context of sustainable rural tourism during the Covid 19 pandemic. Web GIS compiled for Ngerangan Tourism Village is expected to be a digital promotion media in the Covid 19 pandemic era so that existence as a Tourism Village can be responsive and adaptive. In compiling the Web GIS, Word Press functions as a website domain, and Story maps functions as a GIS application in displaying information visually and spatially from tourist attraction data and the distribution of health protocol facilities in Ngerangan Tourism Village. It shows that the role of technology in the concept of tourism survival during the Covid-19 pandemic is very much needed. Through web GIS, the spatial information data needed by tourists in accessing tourist destinations can be conveyed to increase tourism promotion during the Covid 19 pandemic. In Ngerangan Tourism Village, the GIS web provides a function in tourism promotion in the form of an inventory of tourism resources owned and identification of tourism development locations presented spatially and visually that can provide an overview for tourists who will visit.

Acknowledgement

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