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Digitalization and Designing a Medicinal Plants Web-based Information System for Supporting Herbal Tourism

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Abstract– Kima Bajo Village is one of the villages in North Minahasa Regency which has great herbal tourism potential. In particular, Kima Bajo Village is known for having a wealth of knowledge about traditional medicine, especially coastal medicinal plants. Apart from that, Kima Bajo Village is a buffer area for the Likupang tourist destination, which is one of the super priority destinations (DSP). A long with technological advances, digitalization has become a solution for optimizing tourism potential. Digitalization of medicinal plants can increase the attractiveness of herbal tourism in Kima Bajo Village and its surroundings. Digitalization in the form of creating a digital database, has an important role in developing herbal tourism in Kima Bajo Village, North Minahasa Regency. In this case, digitalization has a very important role in making it easier to access information and understanding about medicinal plants, both for local people and tourists. Our activity involved mapping the location and spatial distribution of these medicinal plants. The mapping was carried out based on the position of the coordinate point where the medicinal plant population was found in the Kimabajo area. The output of this activity was increasing public services regarding herbal tourism information in digital and web-based form. Apart from that, scientific publications, mass media publications and activity video publications were the output of the activity so that it can contribute optimally to partners and universities.

Keywords: herbal tourism; digitalization; information system; kima bajo

1. INTRODUCTION

Kima Bajo is a village located in Wori District, North Minahasa Regency, North Sulawesi Province, Indonesia. As well as the other Bajo community settlement, this village is very attached to sea ecosystem, which its majority society are fisherman as their profession(Anonimous, 2023). The image map of Kima Bajo village is shown in figure 1.

Figure 1. Image Map of Kima Bajo Village

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The supreme Bajo ethnic group in Kima Bajo village has quite many histories of traditional medicinal treatments (Suyuti & Aris, 2014; Syahrani et al., 2022; Tria Syahrani et al., 2020). Empirically, the Bajo ethnic group society utilizes medicinal plants from the seashore besides from mountains, such as mangrove (bangkau) that is used for dry cough, lamun (samo) for antidote caused by poisonous animal bites, and sea krokot (gaganga) for curing malnourished baby(Fakultas Pertanian et al., 2023; Utina & Katili, 2016). The intellectual property of this Bajo ethnic could be a potential opportunity for the development of culture tourism as well as herbal tourism that supports the main tourism sector in North Minahasa Regency which mostly influential with sea and beach tourism (Waruwu et al., 2020).

Until today, Kima Bajo village has not yet have good literature documentation about medicinal plants, and it is being concerned that their next generation will not have enough file or document related to medicinal plant treatments which generally has been applied for generations. With our research activity, the society can actively involve in mapping of medicinal plants that are often used by the community. The community also will be able to evoke their motivation to conserve the nature, culture, and potency of tourism in their village.

Our community service team is formed with professional people, i.e. public health workers who are accustomed to build community empowerment for improving the level of health, specifically through the use of medicinal plants (Kementerian Kesehatan RI, 2016). The other members are experts in digital and informatics media design to help documenting the data of traditional medicines digitally. This data can be further develop for virtual tourism design that could comprehend the tradition of traditional treatment in Kima Bajo village.

Those activities later on will be used to support our Government program (Merdeka Belajar - Kampus Merdeka) in learning activities for Student Community Service, because through this program Students can improve their soft skills and hard skills competencies in order to be better prepared for and relevant with the needs of generations of society, including village tourism development. This is also could facilitate Students to develop potencies according to their passions and talents.

The activity also gives contribution for the achievement of key performance indicator number 2: Students have off-campus experience, key performance indicator number 3: Lecturers create activities outside campus related to Tridharma written in lecturer workload rubric, and improve key performance indicator number 5: Lecturer works can be utilized by the community, or get international recognitions.

2. IMPLEMENTATION METHOD

The method used in community service activity implemented the following:

2.1 Field Observation

Field observation is a method where researchers directly collecting data from the location or the research main focus infrastructure. In digitalization context and web-based information system design for medicinal plants as a proponent for herbal tourism in Kima Bajo village, field observation covers types of medicinal plants direct observation, available infrastructure, environment condition, and tourists activities.

2.2In-depth Interview

Field observation is a method where researchers directly collecting data from the location or the research main focus infrastructure. In digitalization context and web-based information system design for medicinal plants as a proponent for herbal tourism in Kima Bajo village, field observation covers types of medicinal plants direct observation, available infrastructure, environment condition, and tourists activities.

2.3 Focus Group Discussion (FGD)

Focus Group Discussion (FGD) is a method that involved a group of people with specific purposes or experience related to the research topic. Our FGD included related parties such as medicinal

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plant farmer, tourism businessman, government representatives, and local community. The discussion was guided to discuss related issues about the implementation of web-based information system in supporting the herbal tourism, evaluating ideas, and planning future steps. This is described by figure 2.

Figure 2. Focus Group Discussion in progress

Through the combination of Field Observation, In-depth interview, and Focus Group Discussion, a comprehensive data was collected and represented for supporting effective web-based information system formulation and implementation for medicinal herbal tourism in Kima Bajo village, North Minahasa regency.

3. RESULTS AND DISCUSSION

3.1 Activity Explained

There are 6 (six) primary components as the result of our conducted activities:

3.1.1 Digital Database for Traditional Medicinal Plants

Traditional medicine is an ingredient or potion in the form of plant, animal, mineral, or pollen concentrate, or pollen (galenic), or those herb mixture that had already being conducted for hereditary treatment, and can be applied according to applicable norms in the society. In our database arrangement, it was focused on herbal plants but there were possibilities that animal, mineral and galenic concentrate also being identified. Database was created based on our field data .

3.1.2 Barcode/QR Code Website

QR code, RC code, fast response code, or quick response code is an evolution form of barcode from one dimension into two dimension. The use of QR code is very familiar in Japan and becomes mostly adopted in Indonesia (Luismar & Mukhaiyar, 2020). It is very simple to use the barcode by opening the google application in your smartphone and then click the camera logo and scan the barcode so the information inside it can be recorded and displayed on the smartphone screen directly. According Widya et al (2019), barcode has specific procedure in doing the identification, i.e. black pixel value total reading and then compared to the sample data and testing data.

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3.1.3 Geographic Information System (GIS)

Geographic Information System is an organized collection of computer hardware, software, geographic data, and personnel, which are efficiently designed to gain, store, update, manipulate, analyse, and display all the geographic-reference information (Hidayat & Tarmuji, 2013; Ilyas & Budijanto, 2017). Our Geographic Information System was a complex system integrated with system environment and other computer environment in a functional and network level. Few of them are Hardware, Software, Data, and Management and Geographic Information.

3.1.4 Website

In this era of modern and faster digital development there are many innovations and technology communication that will be continue to be developed by human (Rohman, 2023). One of the result of the continuing innovation is internet. With internet network, we can easily doing things in daily life especially in getting available information. The website itself cannot be separated from things related to the main role and especially in the process of searching for information. Our web-based information system was made as a source page for all information on medicinal plants in Kima Bajo Village.

3.1.5 Web-GIS

Web-GIS is a web-based information consists of several related components. It is the combination between graphic design mapping, digital map with geographic analysis, computer programming, and database, together being integrated to be a design and mapping web. Our designed Web-GIS had the locations where medicinal plants were collected and cultivated by the community (Hermawan et al., 2017).

3.1.6 Google Maps

Google Maps is an online map application service served free by Google. Google Maps service is legally can be access with URL http://mpas.google.com. Through this website, people can access the geographic information almost in all over the world, except North Pole and South Pole area. This service were made interactive with a map that can be scrolled by the user as they want, zoomed with different level, and changed its display performance. In relation to this, our team used Google Maps for mapping the locations.

3.2 Medicinal Plants Web-based Information System

With the primary components, our team designed a Medicinal Plants Web-based Information System for supporting the Herbal Tourism in Kima Bajo village. The designed Web-GIS can be accessed at a URL link 'https://makatana.ybli.or.id/as shown in figure 3.

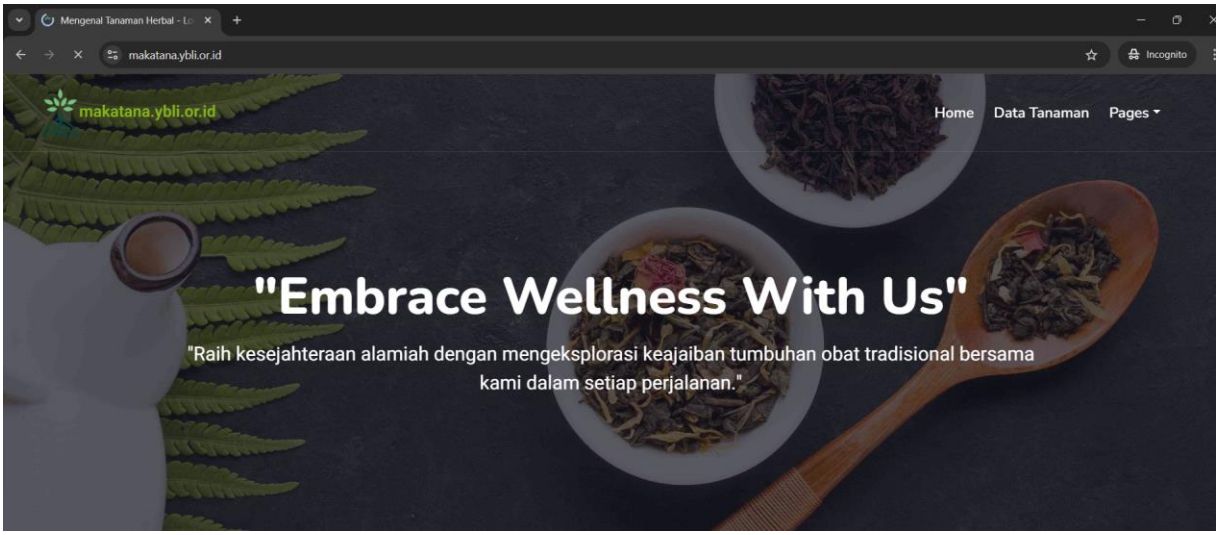

Figure 3. The designed Web-GIS of Medicinal Plants

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People can surf and find the types of medicinal plants in Kima Bajo village by searching through the list (figure 4) or the gallery (figure 5).

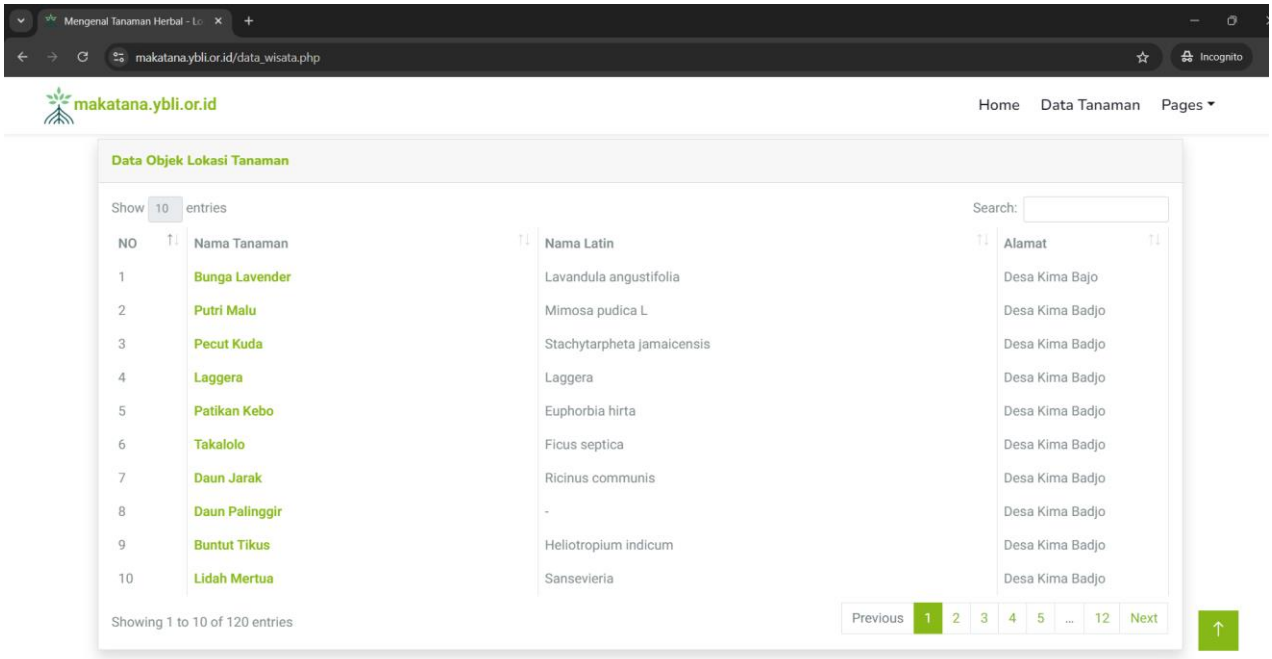

Figure 4. The List of Medicinal Plants in Kima Bajo Village

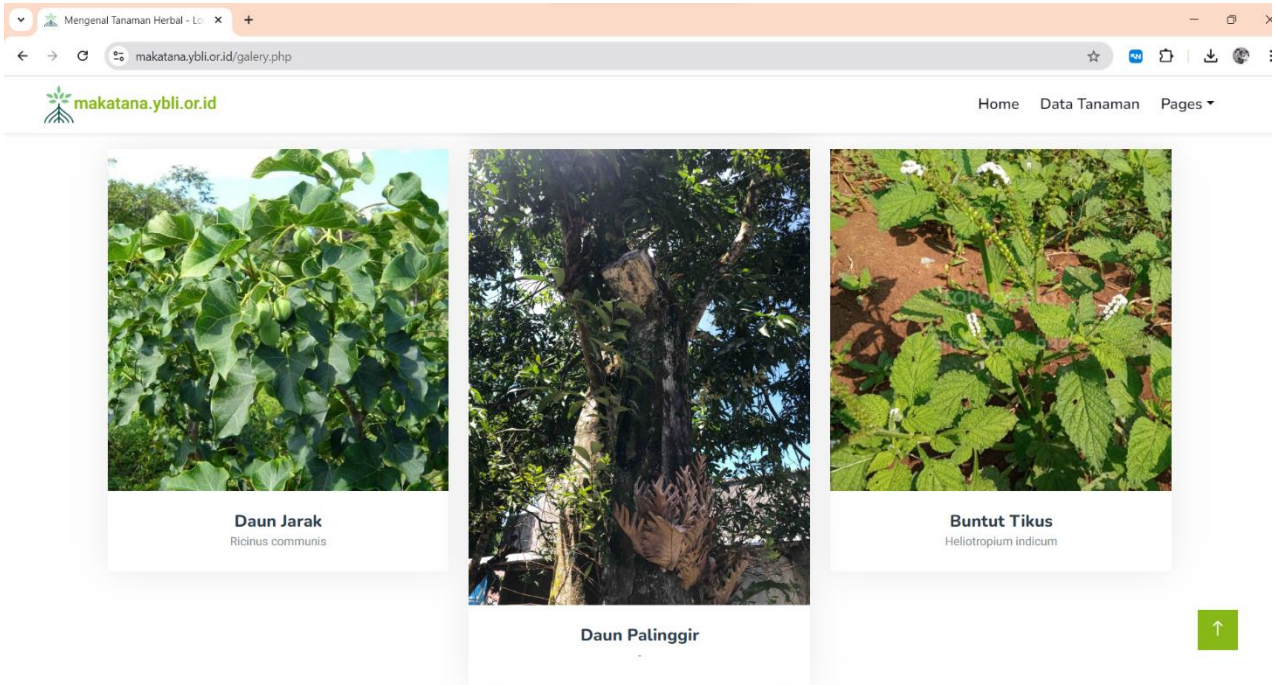

Figure 5. The Gallery of Medicinal Plants in Kima Bajo Village

Furthermore, to find the location of the medicinal plant, people can click the name on the list and will be guided to the related information page, as given in figure 6.

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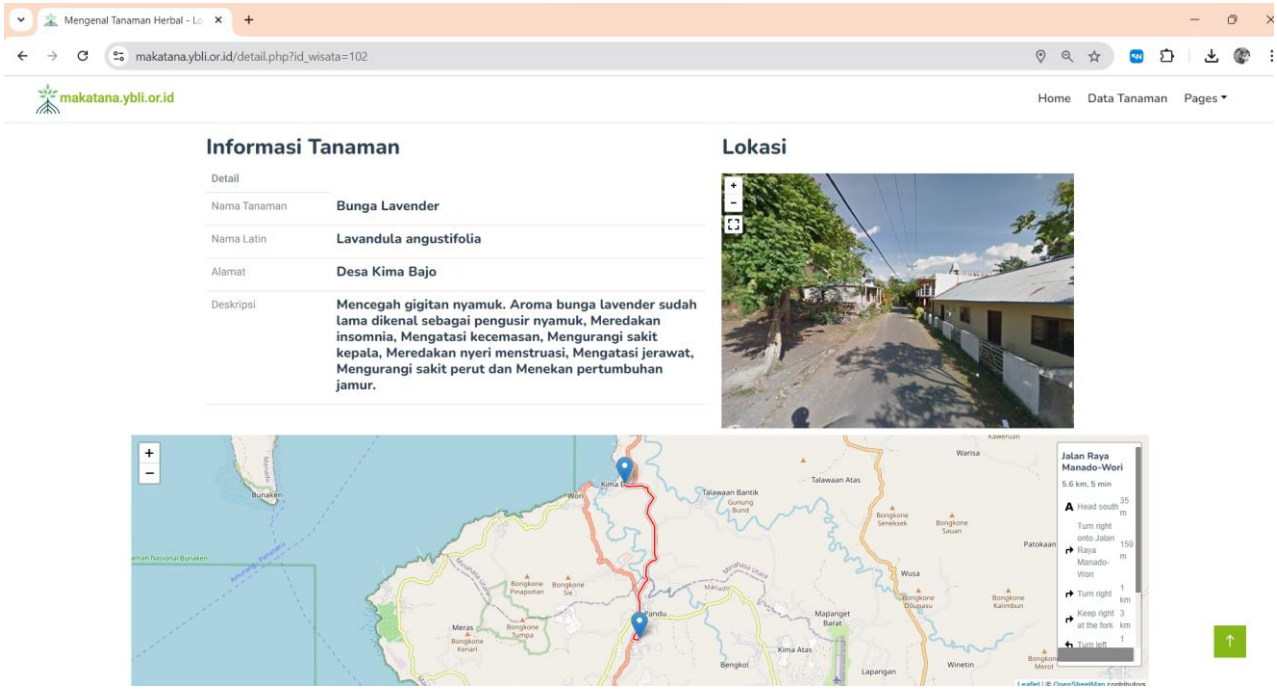

Figure 6. The Information and Location Map of Medicinal Plant

From our survey and implementation to the community and several people, we got positive responds from the use of our Web-GIS information system.

4. CONCLUSION

It can be concluded that before the intervention of our research and community service, Kima Bajo village did not have media to promote herbal tourism, so the activities conducted by our team surely will support the tourism in Kima Bajo village. The village has intellectual properties of medicinal plants, so our digital documentation are very important for them especially for next generations in the community. The web-based information system can be a solution for the sustainable medicinal plant documentation process. The related government and stakeholders must support the development of medicinal plant industry which use local medicinal plants in order to boost the local society economy.

The maintenance of Geographic Information System (GIS) supporting devices and website needs to be assisted by Universitas Sam Ratulangi Manado for its sustainability and positive effects in a long term. The benefit of web-GIS 'https://makatana.ybli.or.id/' can be utilized for medicinal plants mapping and the digitalization of herbal tourism can be develop in other tourism villages in North Sulawesi. Digital Tourism is necessary to have strengthening promotions and physical tourism department in the field.

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