

UTILIZATION OF APPLICATIONS ON ENVIRONMENTAL MANAGEMENT IN RIVER

S. SUROTO^{1,2}, DADANG SUNDAWA^{1,*}, PRAYOGA BESTARI¹,
W. WAHYU², DINI NOOR ARINI³

¹Universitas Pendidikan Indonesia, Bandung, Indonesia

²Universitas Lambung Mangkurat, Banjarmasin, Indonesia

³Washington State University, Pullman, United States

*Corresponding Author: dadangsundawa@upi.edu

Abstract

This research aims to explain the utilization applications by android media to environmental management in the Barito River, South Kalimantan. The method used is Design-based Research, the development of the application that was developed previously, the stages discussed in this research are the last two stages, namely the development and evaluation stages. The results of the developed Application have validity in the very good category in terms of meeting needs, media, and ease of use. Apart from that, a limited media trial was also carried out on the environmental management of the Barito River, because the results showed that the developed applications could be used well, and could provide clear information about the problems and potential of the Barito River in South Kalimantan in processing and maintaining cleanliness and good use of river water. It is recommended that for further research the application be used in research on exploring the problem conditions and potential of the Barito River in South Kalimantan and can be further developed to add templates or other information needed to explore the community and government around the Barito River.

Keywords: Android media, Application, Barito river, Environmental management, South Kalimantan.

1. Introduction

Environmental management is very important for the preservation of the environment itself, especially in rivers. Many rivers are polluted by many pollutants due to human activities, such as throwing garbage into rivers, dumping factory waste, farming fish in a bad way (using chemicals or bombs), and the use of chemicals for household needs and dumping into waters that flow into rivers [1-3]. Many papers regarding the pollution in river have been well-reported [4-7]. This must be a human concern to preserve and protect the diversity in rivers. Thus, the function of river water can be utilized properly without causing bad health to its users.

The Barito river in South Kalimantan, Indonesia, is one of the polluted rivers. This can be seen from the cloudy color of the river water, poor water quality, and high water acidity, and when the water is consumed there is a pungent taste and smell that is not good for health [8, 9]. However, some people who have money choose to buy mountain water for their daily needs. One of the factors that cause water quality to deteriorate is the proximity of coal mines around the Barito River. Thus, the dust becomes air pollution and water pollutants [10]. There are many ways to manage the environment around the river, namely by continuously monitoring the conditions and making conservation and mitigation efforts in conditions that look bad. However, regular monitoring is limited to space and time. To overcome this, with technological advances, we can utilize the internet of things with the use of Android-based applications [11, 12].

This article aims to develop an application based on Android to collect information on problems in the Barito River. Although many studies reported the use of this app, the novelties are the process of creating an application with about information the Barito River as one of the efforts to monitor the condition of the Barito River water quality. Thus, it can manage the environment around the Barito River. Table 1 shows some previous studies on environmental management around the River.

Table 1. Previous research.

Title	Ref.
Collaborative environmental planning in river management: An application of multicriteria decision analysis in the White River Watershed in Vermont.	[13]
Application of the River Styles framework as a basis for river management in New South Wales, Australia.	[14]
The application of palaeohydrology in river management.	[15]
Ecosystem-based river basin management: its approach and policy-level application.	[16]
The DPSIR approach for an integrated river management framework. A preliminary application on a Mediterranean site (Kalamas River-NW Greece).	[17]
Application of Environmental Internet of Things on water quality management of urban scenic river.	[18]
Multiscale river environment classification for water resources management.	[19]

2. Literature Review

2.1. Application with android media

Applications using Android media have been widely used by many people to facilitate work, one of which is searching for references or literature, learning, language use, management systems, and so on [20-25]. Figure 1 shows how applications built using Android media work. The processes that occur are, (i) users use the application via mobile devices, (ii) mobile applications use SDK libraries to read what is ordered or desired by the user, then deliver orders via cloud service for Oracle identify, (iii) mobile applications can browser according to directions and requests, (iv) mobile Retrieves data from cloud service and is identified by oracle, (v) after the mobile successfully obtains data from the cloud, it will be displayed again on the application in android, and (vi) android will display data according to orders to the user.

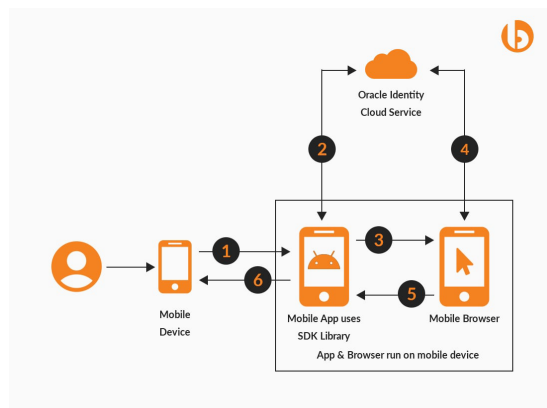


Fig. 1. Applications built using Android media work.

2.2. Environment management

Environmental management is essential for the sustainability and usefulness of resources in the environment itself [26, 27]. Figure 2 shows the types of environmental management that can be done, including: (i) Resource use is the management of resource use and efficiency, (ii) Energy and water use; controlling and reducing water usage and being energy efficient, (iii) waste generation; prevention of biodiversity loss, (iv) carbon emissions; measuring and reducing your organization's carbon footprint, and (v) Biodiversity; prevention of biodiversity loss.

2.3. River pollution

A river can be said to be polluted if there is a change in color, odor, and taste of the water exposed to pollutants [28]. Figure 3 shows several types of pollutants contained in river water. Types of pollutants that are often encountered include chemical pollution, surface water pollution, groundwater pollution, oxygen-depletion pollution, suspended matter pollution, microbial pollution, thermal pollution, and oil spillages [29].



Fig. 2. Types of environmental management.

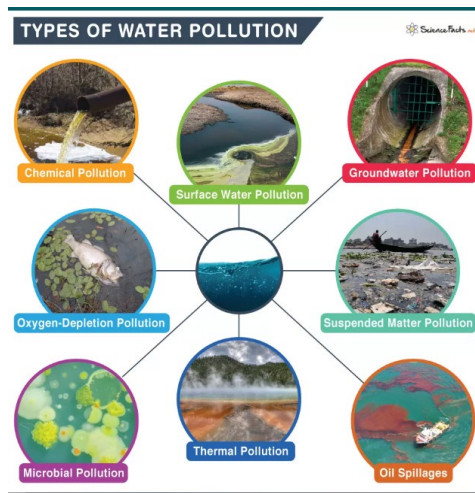


Fig. 3. Type of water pollution.

3. Method

The research carried out is included in design-based research (DBR). The research uses 4 steps, namely: analysis, design, development, and evaluation. The analysis was carried out to check the data needed to be developed in the application, user needs in using the application, and the suitability of the achievements obtained to follow up on the conclusions obtained. Then, the design stage was carried out in the form of an application by Android media for more information about the management environment in the river Barito. This was carried out as a development stage and validation tests were carried out from media experts. In addition to the validation test, a limited trial was carried out on 20 people who used the App on their Android and surveyed River.

4. Results and Discussion

A need analysis was conducted before the android application about environmental management of the Barito River was created. The results of the analysis include: (i) exploring the problems that arise and the need to find solutions around the Barito River based on the results of discussions with the local government and residents,

(ii) discussing possible solutions that can be done, exploring the best way from the solutions offered from various references, and (iii) discussing with the application developer to monitor environmental management around the Barito River, creating icons and designing applications that are tailored to needs.

The problems that are often found are the condition of the water which is often polluted, and the many types of pollutants that enter the river waters. So there needs to be regular monitoring of the condition of the waters in the Barito River. The design designed in making this android media application can be seen in Fig. 4. The flow of its creation begins with logging in, then filling in the data that is monitoring, then filling in the water conditions, and pollutants, not forgetting to photograph and send the condition of the area and the position of the area being monitored.

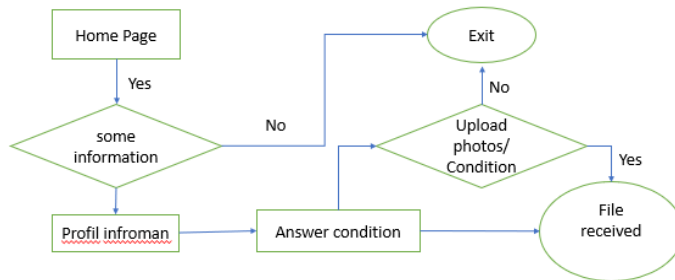


Fig. 4. Flowchart application for barito river.

Admins who will develop the application by adding several questions and checking the input data from the application can do so. Thus, by logging in via the page <https://aplsungaibarito.denia.co.id/login>, we fill in the username and password, select/click Forminator: Forms (to edit and create new forms), Polls (to edit and create new Polls), Quizzes (to edit and create new Quizzes), Submissions (to view and export answers). The appearance of the application that has been developed can be seen in Fig. 5.

In the evaluation stage, the application for environmental management in the Barito River was validated by language and media experts, where the indicators used included suitability for information needs, media, and readability of the application [30]. Several validation tests were carried out on the product, namely in terms of needs, media, and user readability/ease of using the application. With validation percentages, it is proven from the results of the evaluation of the use of this application which was tested by 20 users in terms of suitability for needs, media, and readability/ease of using the application of 90, 85, and 90% respectively. The developed application has validity in the very good category in terms of meeting needs, media, and ease of use [31]. The gasification of coal, electrolysis of water, and steam reforming processes [32]. The composition that causes the color of river water is chemical pollutants mixed in it. Thus, informants who use the information can come from any circle, in addition, the design process used is also very easy to be developed again by subsequent developers [33].

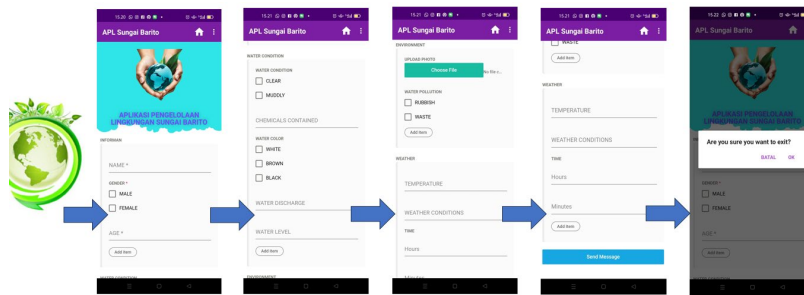


Fig. 5. Application for barito river.

5. Conclusion

This study is to elucidate how Android media can be used for environmental management along the Barito River in South Kalimantan. Design-based methodology is employed. Research, development of the previously developed application, and the final two stages-development and evaluation-are the ones covered in this study. In terms of satisfying needs, media, and convenience of use, the produced application's findings are valid in the very good category.

In addition, a limited media trial on the Barito River's environmental management was conducted because the outcomes demonstrated that the applications that had been developed could be effectively utilized to convey information about the potential and challenges of the Barito River in South Kalimantan in terms of processing and maintaining. This might give precise information regarding the issues and possibilities of South Kalimantan's Barito River in terms of processing, upholding cleanliness, and making appropriate use of river water.

It is advised that the application be used to investigate the potential and problem conditions of the Barito River in South Kalimantan. It can also be further developed to include templates or other data required to investigate the local government and community.

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