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Hazards and Risks Identification in Swimming Activities at the Oya River

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ABSTRACT

Background: Accidents in tourist attractions are very common, especially in natural tourism. Many factors can affect incidents at tourist attractions, whether they are factors from visitors, managers, safety facilities, or tourist locations. In 2023, there were 2 tourists who drowned because they were dragged by the flow of the Oya River in Kapanewon Imogiri, Bantul. As a result of the incident, several tourist attractions around it were temporarily closed to evaluate tourism management. For this reason, it is necessary to identify tourist safety hazards and risks. The purpose of this study is to identify the dangers and risks of swimming activities in the Oya River. **Methods:** this study uses a qualitative method with a descriptive type of research and uses a case study approach. The number of informants in this study amounted to 4 people consisting of 1 tourism manager, 1 land owner, and 2 tourists. **Results:** The results of the study show that there are types of hazards in the Kedung Parangan tourist attraction, namely gravity hazards, movement hazards, biological hazards, temperature hazards, and radiation hazards. The results of the risk assessment carried out using the risk table obtained results for all tourism activities, namely 16 low risk levels, 1 medium risk level and 1 high risk level. **Conclusion:** The potential danger that has a high level of risk is found in the potential danger of underheating that is at risk of cramping.

1. Introduction

Indonesia is a country that has a lot of natural attractions. Tourist attractions such as mountains, waterfalls, beaches, lakes, rivers to the sea. One of the regions in Indonesia with a large number of tourist attractions is Bantul Regency which is located in the Special Region of Yogyakarta. In 2020 there are 184 tourist attractions, both natural, artificial, and cultural tourism [1]. Tourist attractions that can be visited are Kedung Parangan which is a watershed of the Oya River. Tourist attractions such as in Kedung Parangan certainly have dangers that threaten every tourist who visits

In 2023, there have been 2 cases of people drowning in the Oya River in Bantul Regency, making the surrounding tourist attractions temporarily closed [2]. The high number of accidents in tourist attractions requires tourist attraction managers to carry out K3 risk management as stated in Law Number 10 of 2009 concerning Tourism that the government, local governments and tourism entrepreneurs are obliged to provide comfort, hospitality, security protection, and safety of tourists.

Periodical of Occupational Safety and Health
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K3 risk management according to standards *AS/NZS* 4360:2004 is a process that begins with determining the context, identifying risks, assessing risks (risk analysis and risk evaluation), and controlling risks [3]. Many devices can be used to carry out K3 risk management such as *Job Safety Analysis (JSA), Hazard and Operability Study (HAZOP), Fault Tree Analysis (FTA), Event Tree Analysis (ETA), Bow Tie Analysis (BTA) dan HIRADC (Hazard Identification, Risk Assessment, and Determine Control).* In this study, the author used a *HIRADC* to identify hazards, assess and evaluate risks and control risks [4].

Kedung Parangan is a tourist attraction located in Imogiri District, Bantul Regency. This tourist attraction is one of the tourist attractions by utilizing the river flow. From the findings of field observations and interviews with 4 informants, namely 1 manager, 1 tourist attraction land owner, and 2 tourists, there are five dangers that can occur to managers and tourists in this Kedung Parangan tourist attraction. These hazards are gravitational hazards, motion hazards, temperature hazards, radiation hazards, chemical hazards, and biological hazards. The purpose of this study is to identify the dangers and risks of swimming activities in the Oya River.

2. Methods

This study uses a qualitative method with a descriptive type of research and uses a case study approach. The case study approach is based on tourist attractions that utilize river flows that have occurred incidents of drowning tourists in 2023. The results of qualitative research are descriptions of words that describe the events found by conducting interviews and direct observation [5]. The purpose of this case study approach is to obtain in-depth knowledge or information about an event or occurrence in the Oya River tourist attraction. The informants in this study are 4 people who are tourist land owners, managers, and tourists.

Hazard and risk identification is a step taken to identify hazards and risks in the activities to be observed. Then risk assessment is a step to find out the level of risk that is had in a job by using the risk formula, namely *Likelihood* × *Consequences* based on the data that has been obtained. *Likelihood* is an assessment of how likely it is for a dangerous event to occur [3]. In this study, 5 levels were used *Likelihood* in the following table.

Table 1. Scale *Likelihood*

Level	Description	Description
1	*Sweet*	It almost never happens or occurs only under special conditions
2	*Unlikely*	Rare or may occur in some specific conditions, but unlikely (annual)
3	*Possible*	May occur once in a while (monthly)
4	*Likely*	Frequent (weekly)
5	*Almost Certaint*	Can occur at any time (daily)

Then to *Consequences* is an assessment of how much severity an event occurs [3]. In this study, 5 levels were used *Likelihood* in the following table.

Table 2. Scale Consequences

Level	Description	Description
1	*Insignificant*	No injury, minor financial loss
2	*Minor*	Minor injuries, moderate financial losses
3	*Moderate*	Moderate injuries, need for medical treatment, major financial losses
4	*Major*	Serious injury >1 person, impairment of activity, major loss
5	Catastrophic	Fatal of more than one person, widespread impact that has a long-lasting impact, the cessation of all activities, and enormous losses

After knowing the potential dangers and risks with the *value of likelihood* and *consequences* in each tourist activity. Then the *likelihood* and *consequences* values obtained are recorded and analyzed using a risk assessment matrix so that the level of risk is known. The following is a table of the risk assessment matrix and the categories used.

Table 3. Risk Assessment Matrix

Risk Level Matrix		Consequences				
		1	2	3	4	5
Description	Likelihood	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certaint	5	H	H	E	E	E
Likely	4	M	H	H	E	E
Possible	3	L	M	H	E	E
Unlikely	2	L	L	M	H	E

3. Results and Discussion

This section presents the results of the analysis of the research data that has been obtained and the discussion of the findings in a systematic and objective manner. The results of the study are presented in a concise and structured manner to show the actual conditions based on the analyzed data, then interpreted to explain their meaning, tendencies, and implications for the purpose of the study. The discussion is carried out by relating the results obtained to theoretical concepts, applicable standards, and previous research findings so that relevant experimental conclusions can be drawn and can be scientifically accounted for.

3.1. Results

The research results obtained in this study are presented in the following section, which contains the presentation of the analysis data in a systematic and structured manner in accordance with the research objectives.

3.1.1. Hazard and Risk Identification

The results of hazard identification and risk assessment in swimming activities at the Kedung Parangan Tourist Attraction found that there are types of hazards, potential hazards, risks, and the level of risk known from the results of interviews and observations that have occurred during the opening of this tourist attraction. The results of the identification and risk assessment are detailed in the following table 4.

Table 4. Hazard Identification and Risk Assessment Results

Types and Potential Hazards	Risks	Likelihood Level (*L*)	Severity (*C*)	Risk Level (L × C)
Movement hazards (River depth) and Gravitational hazards (Heavy flows)	Drowning	*Unlikely* (2)	*Moderate* (3)	*Medium*
	Loss of consciousness	*Rare* (1)	*Insignificant* (1)	*Low*
Movement hazards (Less heating)	Cramp	*Likely* (4)	*Minor* (2)	*High*
	Sprained	*Rare* (1)	*Insignificant* (1)	*Low*
Temperature hazards and Radiation hazards (Heat of sunlight)	Dehydration	*Rare* (1)	*Insignificant* (1)	*Low*
	Dizziness	*Rare* (1)	*Insignificant* (1)	*Low*
	Dry skin	*Rare* (1)	*Insignificant* (1)	*Low*
	Loss of consciousness	*Rare* (1)	*Insignificant* (1)	*Low*
	Heat stress	*Rare* (1)	*Insignificant* (1)	*Low*
Biological hazards (Snake animals)	Snake bites	*Rare* (1)	*Insignificant* (1)	*Low*
	Poisoning of snake venom	*Rare* (1)	*Insignificant* (1)	*Low*
Movement hazards (Tectonic earthquakes)	There was panic	*Rare* (1)	*Insignificant* (1)	*Low*
Movement hazards (Flash flood)	Drowning	*Rare* (1)	*Insignificant* (1)	*Low*
	Loss of consciousness	*Rare* (1)	*Insignificant* (1)	*Low*
Movement hazards and Gravitational hazards	Slipped	*Rare* (1)	*Insignificant* (1)	*Low*
	Falling	*Rare* (1)	*Insignificant* (1)	*Low*

Periodical of Occupational Safety and Health
Vol. 4, No. 2, October 2025, pp. 1-11
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Types and Potential Hazards	Risks	Likelihood Level (*L*)	Severity (*C*)	Risk Level (L × C)
(Rocky river area)	Bump	*Unlikely* (2)	*Minor* (2)	*Low*
	Injury	*Rare* (1)	*Insignificant* (1)	*Low*

3.1.2. Risk Evaluation

Evaluation of K3 risks in research to determine acceptable, tolerable, and intolerable risks in swimming activities at Kedung Parangan tourist attractions so that it can be determined what risks are priorities to be controlled first. The evaluation to prioritize risks uses the principle of as low *as reasonably practicable (ALARP)* and is categorized into three, namely acceptable risks are risks that have a low category, tolerable risks are risks that have a medium category, and risks that cannot be tolerated when the risks have a high and extreme category. The risks to swimming activities at Kedung Parangan tourist attractions will be determined whether it is acceptable, tolerated, or intolerable

Based on the K3 risk assessment, it is known that the low risk level is 16 levels of risk, then the medium risk level is 1 level of risk, and the high risk level *is* 1 level of risk. The results of the assessment can be found if there is 1 level of high risk that cannot be tolerated, namely the potential for lack of warming while swimming. Then for tolerable risks, there is 1 level of medium risk. For acceptable risks, there are 16 levels of risk with low *risk*. Based on the ALARP principle, the risks that must be a priority to be controlled are the risk of cramping and drowning

3.1.3. Risk Control

K3 risk control in swimming activities is known by conducting interviews and field observations to find out the K3 risk control that has been carried out by the management of the Kedung Parangan tourist attraction. The control of potential hazards and risks of K3 is detailed in table 5.

Table 5. K3 Hazard and Risk Management

Types and Potency Danger	Existing controls	Control Recommendations
Movement hazards (River depth) and Gravitational hazards (Heavy flows)	- Putting a limit on the rapid flow of the river - Use a life jacket when swimming - Give verbal warnings - Taking emergency response training	**Administrative Control:** - Placing a trained *lifeguard* on the edge of a rushing river - Provide warning signs in areas of rivers with strong currents - Provide signs related to the depth of the river
Movement hazards (Less heating)	- Placing trained lifeguards in tourist areas - Supervision and direction by managers in risk areas	**Administrative Control:** - Warming up before swimming - Provides a warning sign to warm up first
Temperature hazards and Radiation hazards (Heat of sunlight)	- Consume enough fluids - Wearing clothing that covers the body (hat, long-sleeved clothing) - Using *sunscreen*	**Administrative Control**: - Installation of posters reminding to drink enough water and to use clothes that cover the body **Control with PPE:** - Using anti-UV clothing
Potency and Types Danger	**Existing controls**	**Control Recommendations**
Biological hazards (Snake animals)	- Cleaning the river environment used for tourist areas	**Administrative Control**: - Installation of wild animal danger signs in tourist areas - Provide evacuation procedures in case of animal-related incidents - Preparing P3K boxes
Movement hazards (Tectonic earthquakes)	- Create an airy and safe area of land - Placing *a trained* lifeguard	**Administrative Control:** - Conduct disaster mitigation for managers - Installation of evacuation route signage and *assembly point* boards in an open and safe ground area
Movement hazards (Flash floods)	- Placing trained *lifeguards* in tourist areas - Coordination between tourist attraction managers who utilize	**Administrative Control:** - Installing a warning sign for a sudden rise in water **Control with PPE:**

	watersheds in the upper reaches of the river - Closure of tourist attractions in the event of heavy rain - Using a life jacket	- Installing a lifeline at the end of the attraction
Movement hazards and Gravitational hazards (Rocky river area)	- Be careful in your steps	**Administrative Control:** - Creating a memorial board of many slippery rocks

The control efforts that have been carried out by the Kedung Parangan tourism manager in terms of risk control are the use of floats that are required to prevent drowning while swimming. Coordinating with residents in the upper reaches of the river regarding water discharge to prevent casualties due to flash floods. Creating a boundary in a heavy stream using pieces of wood to prevent being dragged by the river current. Clearing shrubs around tourist areas to prevent the use of wild animal nests. There are also tourists who use *sunscreen* to protect the skin from the dangers of UV radiation.

The control of engineering engineering carried out by the manager, namely by making boundaries from logs, cleaning the tourist environment, and making a large area as a gathering point, is evident from the interview with the manager as follows:

"Well, maybe tomorrow if the location is opened again, usually the dam will be made again, basically the wood will be lifted" **(Manager)**

"Like the one next door, there is no room to wait for when it's crowded, so it's not crowded, and visitors are still comfortable waiting anywhere. For example, if there is a landslide and an earthquake, we can gather there in a large area" **(Manager)**

"Snakes are mostly in the trees and in the bush, so they don't clean it to be safe, even though the snakes are rich from the forest around here" **(Manager)**

Administrative control such as the existence of *lifeguar*, closing tourist attractions, appeals and directions given by the manager to tourists regarding risky things in tourist attractions and also communication with parties outside Kedung Parangan, as evidenced by the interview with the manager as follows:

"At least there are four officers from one canoe from one parking lot to one who sells owns land, one, two, there are two who have land" **(Manager)**

"For example, in the Bunder area, the Semin area, my friend may have said that the water has overflowed here, oh ready. Rich Semin gets here how many hours, 8 hours" **(Manager)**

"Yes, actually it is still heavy when it opens when it is about a month away. One and a half times it will be closed first" **(Manager)**

"Actually, yesterday it was already in another school. But it doesn't pass the possibility. did not pass because yesterday from the DIY office. The school that trains is from the DIY office" **(Manager)**

Control with PPE such as the use of buoys is highly emphasized by the management to tourists who will swim without exception, as evidenced by the interview with the manager as follows:

"If you want to swim, you can but you have to wear a buoy" **(Manager)**

This is also reinforced by statements from tourists regarding the use of buoys at the tourist attraction:

"It's not bad, yes, a buoy is provided for the canoe itself, it's in good condition" **(Visitor 1)**

"If the men were using buoys, they were using buoys. Someone was with me when I got there. It was the same with his father. They are already using buoys" **(Visitor 2)**

Based on the existing controls, administrative control and control with personal protective equipment are good enough as basic control. However, there are several controls that can be added by the management. It is recommended to increase administrative control by multiplying signs, whether warnings, appeals, directions, or important information so that tourists can understand the available information quickly. In addition, you can also add a manager who also supervises tourists while playing. Control with personal protective equipment is recommended by installing a lifeline in the heavy part of the river and providing a complete P3K box.

Periodical of Occupational Safety and Health
Vol. 4, No. 2, October 2025, pp. 1-11
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3.2. Discussion

3.2.1. Hazard and Risk Identification

The Kedung Parangan tourist attraction that utilizes the watershed is very attractive to tourists who visit to swim or play in the river. Swimming tourism activities have the potential for danger of river depth and strong currents. Accidents that pose a high risk to tourists at tourist attractions that utilize watersheds (watersheds) are drowning [6]. In 2023, there have been 2 cases of people drowning in the Oya River in Bantul Regency, making the tourist attraction temporarily closed [2].

The quiet flow speed in Kedung Parangan itself has a wide and deep watershed character compared to the narrow and shallow rapids [7]. The occurrence of accidents due to the depth of the river and the strong currents can be caused by 2 things. First, the ignorance of tourists about the condition of the river and second, the lack of barriers and warning boards regarding the limits of canoeing. These potential dangers can result in tourists at risk of drowning. In addition to natural factors, the risk of accidents to visitors can also be caused by human factors themselves which have a tendency to be unfortunate or unsafe [8]. These behaviors include being reluctant to use buoys, swimming to a heavy part of the river, and for those who can't swim, playing to the middle of the river.

Swimming is a sport that moves the whole body such as hands and feet to move the body forward, backward, and sideways. Before swimming, there is a potential danger of underheating which is at risk of cramps and sprains on the body. Cramps while swimming can occur due to a lack of warm-up before swimming or a wrong greeting to make swimming movements [9].

In addition to the potential dangers arising from tourism activities, there are also potential dangers from natural disasters such as tectonic earthquakes, and flash floods. Tectonic earthquakes are natural phenomena in the form of vibrations that occur on the earth's surface due to a sudden release of energy that creates seismic waves that are usually caused by the movement of the earth's plates [10]. The phenomenon of earthquakes is certainly very dangerous which can risk cracking the ground, knocking down trees, and sliding the ground so that it creates panic in tourists. Moreover, if the Oya River is an active fault that can move at any time [11].

The volume of river water is very susceptible to sudden increases, especially if it is during the rainy season. Sudden water or flash floods sweep the entire watershed it passes through without exception. When there are tourists who are playing in the river, then there is heavy rain in the upper reaches of the river, this event will occur, tourists are at risk of being dragged into the river, drowning, and disappearing or dying. Incidents of being dragged by flash floods are quite frequent in several tourist attractions that utilize watersheds in Indonesia, such as the incident that befell junior high school students in Sleman who were carrying out activities along the river, resulting in dozens of students being dragged and ten students dying [12]. Another flash flood incident occurred in Karanganyar Regency, Central Java that hit a tubing ride, causing three tourists to be dragged by the current [13].

3.2.2. Risk Assessment

Swimming tourism activities have the potential to be dangerous in river depths and heavy streams, causing the risk of drowning and loss of consciousness. The condition of the river is deep and has a heavy current in the upstream and downstream parts of the tourist attraction is very risky for tourists to drown. Drowning is the most common incident when active in the waters and has a very large risk and can result in death [15]. Based on the results of the risk assessment, it is known that the potential danger of river depth and heavy flow for the risk of drowning has a probability value *Unlikely* (2) that it is rare or can occur in some specific conditions, but it is unlikely (annual) and the severity is that *moderate* (3) or moderate injury, need medical treatment, large financial losses, so that the result of multiplication is obtained at a moderate level of risk (*moderate risk*). For the risk of losing consciousness has a value of possibilities *sweets* (1) i.e. it almost never occurs or occurs only in special conditions and severity i.e. *insignificant* (1) or there is no injury, small financial loss, so that the multiplication result is obtained at a low risk level *(low risk)*.

Swimming is a sport that moves the whole body such as hands and feet to move the body forward, backward, and sideways. When swimming, there is a potential danger of underheating which is at risk of cramping and sprains in the body. Based on the results of the risk assessment, it is known that the potential danger of underheating for the risk of cramps has a probability value of *likely* (4) which is frequent (weekly) and severity which is *minor* (2) or minor injury, small financial loss, so that the multiplication result is obtained a high risk level. For the risk of sprain, there is *a rare* probability value (1) which is almost never occurring or occurs only in special conditions and the severity is *insignificant*

(1) or no injury, financial losses are small, so that the multiplication results are obtained at *a low risk level*.

Rivers generally have rocks, both small and large, on its banks. Sometimes the stone is covered by moss or mud that makes the stone slippery and invisible, so there is a potential danger of slipping, falling, and minor to severe injury [16]. Based on the results of the risk assessment, it is known that the potential hazard of the rocky river area for this risk has a probability value *Unlikely* (2) that it is rare or can occur in some specific conditions, but it is unlikely (annual) and the severity is that *minor* (2) or minor injury, small financial loss, so that the result of multiplication is obtained at a low risk level (*Low Risk*).

This swimming activity is carried out in an open place and is in direct contact with sunlight so that it has the potential for heat danger from sunlight. If exposed for a long period of time, health risks will arise such as dehydration, dizziness, dry skin, loss of consciousness, and *Heat stress* [17]. Based on the results of the risk assessment, it is known that the potential heat of sun danger for the risk of dehydration, dizziness, dry skin, loss of consciousness, and *Heat stress* has a probability value *sweets* (1) i.e. it almost never occurs or occurs only in special conditions and severity i.e. *insignificant* (1) or there is no injury, small financial loss, so that the result of multiplication is obtained at a low risk level (*Low Risk*).

Tourist areas surrounded by gardens and forests do not rule out the possibility of potential snake dangers. Even more so if the place has a lot of bushes across the river and next to the tourist area. If bitten by a venomous snake, there is a risk of being bitten by a snake, poisoning can be a snake [18]. Based on the results of the risk assessment, it is known that the potential danger of wild animals for the risk of snake bites, snake venom poisoning, and mosquito bites has a probability value *sweets* (1) i.e. it almost never occurs or occurs only in special conditions and severity i.e. *insignificant* (1) or there is no injury, small financial loss, so that the result of multiplication is obtained at a low risk level (*Low Risk*).

Every place where humans are will definitely be inseparable from natural disasters such as tectonic earthquakes, as well as the tourist attraction of Kedung Parangan. Moreover, if the Oya River area is a fault that can be moved, there is a potential danger of tectonic earthquakes [19]. When a tectonic earthquake occurs at this tourist attraction, tourists are at risk of being hit by fallen trees and panic occurs. Based on the results of the risk assessment, it is known that the potential danger of tectonic earthquakes for the risk of falling trees and panic has a probability value *sweets* (1) i.e. it almost never occurs or occurs only in special conditions and severity i.e. *insignificant* (1) or there is no injury, small financial loss, so that the result of multiplication is obtained at a low risk level (*Low Risk*).

In addition to tectonic earthquakes, this tourist attraction also has the potential to be dangerous from overflowing river water or flash floods. Rivers, which are waterways that flow from upstream to downstream, often overflow, especially during the rainy season [20]. If the tourist area does not rain and the water discharge is still small, but in the upstream part of the river there is heavy rain, there will be flash floods that are at risk to tourists such as drowning and unconsciousness. Based on the results of the risk assessment, it is known that the potential danger of flash floods for the risk of drowning and unconsciousness has a probability value *sweets* (1) i.e. it almost never occurs or occurs only in special conditions and severity i.e. *insignificant* (1) or there is no injury, small financial loss, so that the result of multiplication is obtained at a low risk level (*Low Risk*).

3.2.3. Risk Evaluation

Tourism activities in Kedung Parangan have potential hazards and risks that have been carried out risk assessments to find out the level of risk of each tourist activity in Kedung Parangan tourist attractions. Risks that have been known to have a value are then evaluated and the results are obtained that there is a low risk (*Low Risk*), medium (*medium risk*), and high (*High Risk*). Risk evaluation is used to determine the priority of risks that need to be taken control measures with the concept *As Low As Reasonably Practicable* (*ALARP*) [3].

An intolerable risk in tourist attractions is the lack of heating. The high level of risk is due to the high frequency of events such as stomach cramps in tourists. Moderate risks in this tourist attraction can be tolerated, namely the depth of the river and the rapid flow. This moderate level of risk is still tolerable because the severity that occurred at the time of the incident did not interfere with tourism activities and there were no fatal casualties even though the incident occurred occasionally or could occur every day. In accordance with *the principles of ALARP* which prioritizes unaccepted risks or medium and high risks so that control can be carried out until the risk is acceptable. To control these

Periodical of Occupational Safety and Health
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risks, the management has made several efforts such as always supervising tourists, giving verbal warnings, and mandatory use of buoys, in addition to making a boundary from wooden blocks.

The acceptable risk in tourist attractions here is low risk *(low risk)*. There are more low risks in this tourist attraction than the medium and high risk levels, which are 16 low risk levels. The hazard and risk controls that have been implemented by the manager make tourist attractions have many low risk levels, even so there are still some controls that must be applied by the tourism manager. These risks can still be controlled by tourism managers by supervising tourists, explaining how to move the canoe correctly, telling tourists to warm up first, and taking part in P3K training. The existence of P3K training can provide knowledge, understanding, and competence to the management in terms of handling every emergency condition [21].

3.3.4. Risk Control

Based on the results of the risk assessment, the level of risk in swimming activities at the Kedung Parangan tourist attraction was obtained. From this risk assessment, risk control efforts are needed to reduce the occurrence of hazards so that conditions can be safe and secure. According to Ramli (2010), risk control is carried out based on the hierarchy of K3 control, namely elimination, substitution, technical control, administrative control, and personal protective equipment [3].

Several risk control efforts have been made by the management of the Kedung Parangan tourist attraction in swimming activities. Efforts to control these hazards are to provide limits in the form of wood and stones to the rapid flow of rivers, place trained managers or *lifeguards* in tourist areas, provide verbal warnings, provide life jacket facilities, clean the environment in tourist areas, create spacious and safe land areas, coordinate with other tourism managers who use the Oya watershed, and close tourist attractions. Apart from the manager, tourists also apply consuming enough fluids, and wearing clothes that cover the body. To anticipate that the risk control that has been carried out has not been maximized, the researcher proposes several opinions on K3 risk control based on the potential hazards and risks found. Recommendations for risk control in swimming tourism activities ranging from substitution control to control of Personal Protective Equipment (PPE) that can be applied by managers and tourists.

The depth of the river and the heavy flow are potential dangers in swimming activities. From the results of hazard identification and field observations that have been carried out, the recommendation for the hazard control is administrative control. The control is by placing *Lifeguard* Trained in tourist areas, especially at the border towards the swift flow of the river, gave the widow warnings and Wednesdays regarding the limits and depths of the river. Existence *Lifeguard* In this tourist attraction, it is somewhat lacking, because on average per day there are 2-4 managers who are still divided into tasks. All tourist attractions are in dire need of *Lifeguard*, especially if water tourism is very important to provide first aid as soon as possible so as to reduce the risk of accidents [22].

Recommendations for controlling the potential dangers of underheating that can pose a risk of discomfort in cramped and sprained parts of the body is by controlling warm-up movements before swimming. Physical warm-up before swimming is one to prevent muscle cramps. Optimal physical warm-up is a means for soft tissues to adjust their activities before exercise [23].

Tourist attractions in the open air also have the potential danger of hot sunlight which poses health risks such as dehydration, dizziness, dry skin, loss of consciousness, *Heat stress,* and *sunburn.* Risk control recommendations that can be done for these risks are in the form of administrative control by installing posters reminding to drink enough water, installing posters reminding to use clothes that cover the body. Control with PPE by using clothing that covers the body (shirts and long-sleeved pants), using *sunscreen* and using anti-UV clothing [24].

Activities in tourist attractions are inseparable from the potential dangers of natural disasters such as tectonic earthquakes that pose a risk of being hit by fallen trees, undulating river water such as tsunamis, and panic. The risk control recommendation is in the form of administrative control with the installation of evacuation route signage and boards *Assembly Point* in an airy and safe land area and carry out disaster mitigation to the manager. Disaster mitigation is very important for tourism managers to improve their ability to deal with disaster threats that can occur in the region [25]. Rivers also have the potential for the danger of river water overflowing or flash floods that pose a risk to tourists being dragged by river currents, drowning, and unconscious. The risk control recommendation is in the form of control with PPE, namely installing a lifeline that crosses the river at the end of the tourist attraction.

4. Conclusion

The conclusion of this study was obtained that the results of the identification of hazards and risks of swimming activities in Kedung Parangan were gravitational hazards, movement hazards, hazards, temperatures, radiation hazards, and biological hazards. The results of the risk assessment found that the potential hazard with a high *risk* level was 1 level of risk, a medium risk level of 1 level of risk, and a low risk level of 16 levels of risk. For the results of the risk evaluation, it was found that there was 1 level of high risk that could not be tolerated, namely lack of warming up while swimming. The control efforts that have been carried out by the tourism management are by making boundaries from wooden blocks, cleaning the tourist environment, making large areas as gathering points, and providing personal protective equipment in the form of buoys.

Statement

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