

Students' Instructional Participation and Awareness on Biodiversity Conservation in the Sawaga River as Historical Landmark and Sacred Site of Bukidnon

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ABSTRACT

River flows connect people, places, and other forms of life, inspiring and sustaining diverse cultural beliefs, values, and ways of life. This study aimed to determine the Students' Instructional Participation and Awareness of Biodiversity Conservation in the Sawaga River. The study employed a non-experimental, descriptive-correlational, quantitative design. Different methods were used to gather pertinent information to address the study objectives. The relationship of biodiversity conservation to the instructional participation, environmental awareness, historical landmark and sacred site awareness of students was found to be positively weak. But the only significant associations or relationships that exist with biodiversity conservation are classroom activities, environmental awareness, nature appreciation, and religious use of sites. The regression model obtained significantly predicts biodiversity conservation since the p-value obtained is less than the significance level of 0.05. It can be concluded that students have the interest to participate in the instructional activities conducted relating to the Sawaga River. Their participation was evident in the activities done in the fieldwork, classroom, and online. The students' environmental awareness has influenced their deep understanding of the importance of biodiversity conservation. thus making them contribute somehow to the protection, upliftment, and management of biodiversity. Moreover, educating students about the monumental value and religious use of the Sawaga River leads to a significant prediction of the biodiversity conservation of the Sawaga River.

Keywords: Sawaga River, Science Students, Instructional Materials, Conservation, Biodiversity

INTRODUCTION

Over the last century, riverine ecosystems have suffered from intense human intervention, resulting in habitat loss and degradation and as a consequence (Negi and Mamgain, 2013).

Rivers have been very useful to men in all parts of the earth since very early times. They provide water to slake men's thirst, fertilize their lands, and provide a means of communication for the goods that are transported from place to place.

The Philippines is one of the places where the freshwater ecosystem is in danger of dying. In Mindanao alone, five river systems have been declared biologically threatened by the Environmental Management Bureau of the Department of Environment and Natural Resources (DENR).

Participation of the public and stakeholders in river basin management is increasingly promoted because it is expected to improve resource management and enable participants to engage freely and equally in management.

National Government regulations help protect water resources but do not do the whole job. Local government has an important role as – often as a proactive preventative function. Local government units have a very important role in protecting surface water, groundwater, drinking water, and wetlands, often filling in the gaps in National regulations. If the local government does not do so with local zoning, these gaps may not be addressed. There are various national laws designed to protect water quality. But relying only on national laws may not do a complete job.

Rivers are one of the most diverse and threatened ecosystems on Earth, as they are affected by human strains. Since rivers provide essential goods and services, conservation of these ecosystems is necessary for sustainable development. Seeking ways to conserve healthy rivers and restore degraded ones (Sabater & Elosegi, 2013).

Ecological studies have grown tremendously in the early 2000s and have begun to influence theoretical thinking on city forms. It has resulted in a radical shift in the way cities are viewed from being physical systems to biological ones (Wu & Hobbs, 2002; Pickett et al., 2004). In urban systems, rivers are now recognized as important ecological and social components. However, within the context of cities with historic urban cores, cultural heritage has primarily focused on the built urban fabric, neglecting the rivers that gave reason for their location. In many cities, conservation practices have followed a monument-centric approach, focusing on restoring heritage buildings and sites and ignoring the cultural value

of ecosystems at large, especially rivers.

Community participation in the development and protection of heritage sites is an effective way to protect resources and develop tourism at heritage sites. Inhabitants' perceptions are critical and essential factors in the study of community participation (Xu et al., 2007; Araujo de Lucena & Xavier, 2012). Existing studies have shown that the perceptions of local people directly affect their participation attitudes and behaviors, resulting in either negative or positive protection effects for heritage tourism sites (Höehn and Thapa, 2009). The fact that inhabitants' perceptions are closely related to various factors, such as demographic characteristics, socioeconomic status, and management systems or organizations, has been confirmed by many domestic and foreign studies.

Bukidnon State University has focused its research capabilities on studies that directly impact the well-being of the people. The University's social responsibility is to utilize research-based knowledge in informing the public of matters concerning Students' Instructional Participation and Awareness of Biodiversity Conservation and the environment in formulating schemes as interventions.

The University's activities participate in the government's Rivers Rehabilitation Program by providing a preliminary status of the Sawaga River and offering scientific data.

Although there were only a few studies done on the Sawaga River, no studies have been conducted regarding Students' Instructional Participation and Awareness of Biodiversity Conservation.

OBJECTIVES OF THE STUDY

This study aimed to determine the Students' Instructional Participation and Awareness of Biodiversity Conservation in the Sawaga River. Specifically, it aimed to: (a) determine the level of instructional participation of students in terms of the following activities fieldwork activities, classroom activities, and online activities; (b) determine the level of environmental awareness of students in terms of nature appreciation and Philippine environmental laws and policies; (c) determine the level of historical landmark and sacred site awareness of students in terms of heritage value of the place and religious use of the sites; (d) determine the level of biodiversity conservation inventory of students in terms of species diversity, water quality, and ecosystem diversity. (e) determine the relationship between biodiversity conservation, instructional participation, environmental awareness, historical landmarks, and sacred site awareness among students; and (f) identify

the variable that best predicts biodiversity conservation in the Sawaga River.

MATERIALS AND METHODS

Ethics statement

The study followed the ethical standards of the University. All necessary permits were obtained for the described study.

Research Design

The study employed a non-experimental, descriptive -correlational, quantitative design. Different methods were used to gather pertinent information to address the study objectives.

Participants and Data collection

Students from Bukidnon State University who are above 18 years old, officially enrolled in science and research subjects, and play an active role in natural resource collection and production activities in the Sawaga River were selected as participants in the study.

Research Instruments

The researcher used a survey questionnaire that was divided into four (4) parts. The first part of the questionnaire determines the level of instructional participation of students in terms of the ff activities: Fieldwork Activities, Classroom Activities, and On-line Activities. The second part determines the level of environmental awareness of students in terms: Nature appreciation, and Local and National policies. The third part determine the level of historical landmark and sacred site awareness of students in terms: monumental value of a place, and religious use of the sites. The fourth part determines the level of biodiversity conservation inventory among students.

Moreover, a five-point scale from 5 as the highest to 1 as the lowest was adopted to identify the survey results' implications.

Table 1

Likert Scale

	Point Value
5	4.50-5.00
4	3.50-4.49
3	2.50-3.49
2	1.50-2.49
1	1.00-1.49

Methods of Data Analysis

The questionnaires were distributed to the participants through Google Forms. The filled-up questionnaires were encoded, and the scores were collected. The data analysis was composed of six parts based on the six objectives of the study using SPSS 14.0 and Microsoft Excel.

Online Focal Group Discussion (FGD) was also conducted with the participants to substantiate the quantitative data. The group of participants was guided by a moderator (or group facilitator), who introduced the topics for discussion and helped the group participate in a lively and natural discussion amongst themselves.

Validity and Reliability of the Instruments

The researcher used Cronbach’s alpha tests to determine whether the multiple-question Likert scale surveys designed in this study are reliable. Cronbach’s alpha, developed by Lee Cronbach in 1951, measures reliability, which tells how well a test measures what it should, or internal consistency (Statistics How To, 2020). Using the interpretation of Cronbach’s alpha, the table is presented below.

Table 2

Cronbach’s Alpha Value

Cronbach’s Alpha	Internal Consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$\alpha > 0.8$	Unacceptable

The researcher conducted pilot testing of 20 participants.

Statistical Analysis

Objectives 1, 2, and 3 used descriptive analysis rating scales. Objective 4 used correlational analysis to determine the relationship between biodiversity conservation, instructional participation, environmental awareness, historical landmarks, and sacred site awareness among students. Objective 5 used regression analysis to identify the variable that best predicts biodiversity conservation on the Sawaga River.

RESULTS AND DISCUSSION

1. To determine the level of instructional participation of students in terms of Fieldwork activities, Classroom activities, and Online activities.

Table 3

Level of instructional participation of students in terms of the ff activities: Fieldwork Activities, Classroom Activities, and On-line Activities

	SD	Mean	Description
Fieldwork Activities (in Sawaga River)			
1. Conducts research studies in the SawagaRiver.	.612	4.46	Mostly participated
2. Prepares and observes on-site ocular inspection of the Sawaga environmental features.	.602	4.38	Mostly participated
3. Records of observation in the Sawaga River	.713	4.34	Mostly participated
4. Performs the given activities in Sawaga river.	.677	4.49	Mostly participated
5. Places a metre ruler into the river until it touches the Sawaga River bed.	.633	4.46	Mostly participated
6. Measures the size and shape of a sample of stones from each area visited in the Sawaga River.	.591	4.36	Mostly participated
7. Measures the velocity of Sawaga River in the field.	.573	4.57	Always participated
8. Conducts field surveys and field experiment in the Sawaga River.	.678	4.43	Mostly participated
	.25170	4.4344	Mostly participated
Classroom Activities (Sawaga River)			
1. Answers the guide for biodiversity studies in the Sawaga River.	.621	4.44	Mostly participated
2. Accomplishes Free Writing/Minute Paper/Question of the Day Exercise in the Sawaga River.	.611	4.40	Mostly participated
3. Participates in hands-on demonstrations and Exercises in Sawaga River.	.699	4.36	Mostly participated
4. Participates in interviews or role plays about the Sawaga River.	.685	4.38	Mostly participated
5. Participates in debates about the Sawaga River.	.614	4.51	Always participated
6. Participates in Interactive Demonstrations about the Sawaga River.	.536	4.53	Always participated
7. Conducts Case Studies and Problem-Based Learning about the Sawaga River.	.588	4.58	Always participated
8. Participates in Ice Breakers about the Sawaga River.	.587	4.46	Mostly participated
	.24239	4.4568	Mostly participated

Table 3 continued.

	SD	Mean	Description
On-line Activities (Sawaga River)			
1. Participates in Think-Pair- Share learning about the Sawaga River.	.610	4.43	Mostly participated
2. Joins in interactive brainstorming about the Sawaga River	.663	4.38	Always participated
3. Participates in buzz sessions about the Sawaga River.	.673	4.50	Mostly participated
4. Writes exit slips learning about the Sawaga River.	.608	4.46	Mostly participated
5. Participates in misconception checking and learning about the Sawaga River.	.551	4.44	Always participated
6. Participates in the circle of questions, learning about the Sawaga River.	.552	4.55	Mostly participated
7. Participates in teacher and student learning about the Sawaga River.	.673	4.42	Mostly participated
8. Conducts a peer-review writing task about the Sawaga River.	.628	4.46	Mostly participated
	.24233	4.4548	Mostly participated

Table 4

Summary of the level of instructional participation of students in terms of the ff activities: Fieldwork Activities, Classroom Activities, and On-line Activities

Instructional participation of students	TOTAL MEAN	Verbal Description
Fieldwork Activities (8 items)	4.43	Mostly participated
Classroom Activities(8 items)	4.46	Mostly participated
On-line Activities(8 items)	4.45	Mostly participated
Average mean	4.45	Mostly participated

Legend:	Point Value	Verbal Description
5	4.50-5.00	Always participated
4	3.50-4.49	Mostly participated
3	2.50-3.49	Sometimes participated
2	1.50-2.49	Rarely participated
1	1.00-1.49	Never participated

The results in Tables 3 and 4 show that, overall, there is a high level of instructional participation among students, or they mostly participated in the instructional activities. The students mostly participated in the instructional activities in terms of fieldwork, classroom, and on-line activities. Among all the fieldwork activities, measuring the velocity of the Sawaga River was found to be the one that was always participated in by students. In terms of classroom activities, students have a very high level of participation in debates, interactive demonstrations, conducting case studies, and problem-based learning about the Sawaga River. While in online activities, it was depicted that students always participated in tasks relating to buzz sessions and in the circle of questions learning about the Sawaga River.

This supports Ramadoss and Moli's (2011) study that promotes students' commitment to protect local biodiversity as an important goal of education for sustainable development. According to Woltemade and Fuellhart (2013), education is often championed as perhaps the most effective and lasting strategy

to induce behavioral change along the conservation path. It is not surprising, therefore, that awareness campaigns constitute a basic component of water conservation policies, often operating together with pricing as well as with regulatory action.

The findings of the study support Vassala's (2006) claim that the field study is an educational technique, that makes the educational process more active, helps the students work in real situations, and helps them develop skills, competencies, and positive attitudes through the activation of their existing ones. Nevertheless, implementation of this technique requires very good planning and plenty of time. For these reasons, our students did not have a very good practice experience as teachers/trainers within traditional education. Nadelson & Jordan (2012) emphasized that students who directly participate during a field experience generate a more positive attitude about the subject. Many researchers have investigated the knowledge and learning that occurred during field trips.

2. To determine the level of environmental awareness of students in terms of Nature appreciation, and Local and National policies.

Table 5

Level of environmental awareness of students in terms: Nature appreciation, and Philippine environmental laws and policies

	SD	Mean	Description
Nature appreciation			
1. Trees are to be planted along the Sawaga River.	.673	4.36	Moderately aware
2. Trees are to be hugged along the Sawaga River.	.772	4.34	Moderately aware
3. Making a garden is important along the Sawaga River.	.619	4.47	Moderately aware
4. Going for hiking trails is beneficial in Sawaga River.	.637	4.55	Extremely aware
5. Nature needs to be protected along the Sawaga River.	.531	4.52	Extremely aware
6. Watching more sunsets are enjoyable long the Sawaga River.	.598	4.47	Moderately aware
7. Pollution is to be reduced in the Sawaga River.	.716	4.33	Moderately aware
8. Mankind cannot live without nature and rivers.	.575	4.54	Extremely aware
	.26780	4.4485	Moderately aware
Philippine Environmental Laws and Policies			
1. RA 8749 (Clean Air Act of 1999)	.623	4.36	Moderately aware
2. RA 9275 (Philippine Clean Water Act)	.704	4.36	Moderately aware
3. Philippine Fisheries Code of 1998	.657	4.41	Moderately aware
4. RA 6969 (Toxic Substances and Hazardous Waste Control Act)	.577	4.48	Extremely aware
5. RA 9003 (Ecological Solid Waste Management Act)	4.52	.531	Extremely aware
6. RA 9512 (Environmental Education Act of 2008)	4.51	.639	Moderately aware
7. Wildlife Resources Conservation and Protection Act of 2001	4.43	.579	Moderately aware
8. Water Code of the Philippines	4.47	.582	Moderately aware
	4.4430	.23082	Moderately aware

Table 6

Summary of the level of environmental awareness of students in terms: Nature appreciation, and Local and National policies

Environmental awareness of students	TOTAL MEAN	Verbal Description
Nature appreciation(8 items)	4.45	Moderately aware
Philippine environmental laws and policies (8 items)	4.44	Moderately aware
Average mean	4.45	Moderately aware

Legend:	Point Value	Verbal Description
5	4.50-5.00	Extremely aware
4	3.50-4.49	moderately aware
3	2.50-3.49	somewhat aware
2	1.50-2.49	slightly aware
1	1.00-1.49	not at all aware

Results in Tables 5 and 6 revealed that, in general, students were moderately aware of the environment or had a high level of environmental awareness. The participants in the study were moderately aware of nature appreciation and Philippine environmental laws and policies. But speaking of hiking trails being beneficial in the Sawaga River, nature needs to be protected in the Sawaga River, and mankind cannot live without nature and the river, students were extremely aware of these aspects. Moreover, if RA 9003 (Ecological Solid Waste Management Act) and RA 9512 (Environmental Education Act of 2008) were being talked about, the students would have a very high level of awareness of these Philippine Environmental laws and Policies.

This supports Sabater and Elosegí (2013) study showing that nature conservation can operate at different levels. Some actions focus on conserving populations; others focus on the habitats where these populations live; still others focus on ecosystem processes. Conservation biology, thus, is part of a broader movement that aims to conserve nature and the quality of the environment as a way to ensure the well-being of oncoming generations as well as protect the intrinsic values of biodiversity.

The findings of the study support Punzalan’s (2020) statement that environmental education in the Philippines has been incorporated into different course curricula, including life and physical sciences, social studies, geography, civics, and moral education. The results of her study support the fact that the level of environmental awareness of students is significantly and substantially related to their extent of environmental practice, and the development of environmental education programs has maintained and increased the understanding and capacities of the students in relation to environmental problems and environmental sustainability principles.

Cosico (2012) emphasized in his book “Philippine Environmental Laws: An Overview and Assessment” that the Philippines must have an urgent requirement to regulate human activities aside from elevating the awareness of Filipinos since it is located right in the typhoon belt of the Pacific and more vulnerable to natural calamities and catastrophes. The Philippine Environmental Laws, which should be incorporated in environmental education programs as they pursue to discourse a great number of environmental problems ranging from deforestation, biodiversity loss, and pollution types, were discussed. These statements give ideas for the students to become knowledgeable about Philippine environmental policies by conducting activities to spread these important laws.

Students were not well- aware, but were in support of the Philippines’ biodiversity-related laws, which could help shape their mindset and actions towards biodiversity conservation and protection.

3. To determine the level of historical landmark and sacred site awareness of students in terms of heritage value and religious use of the sites

Table 7

Level of historical landmark and sacred site awareness of students in terms: monumental value of a place, and religious use of the sites

	SD	Mean	Description
Monumental value of a place			
1. The Sawaga River is extremely important and lasting value.	.516	4.40	Moderately aware
2. The monumental records of the Sawaga River are the source of the earliest information on farming.	.588	4.58	Extremely aware
3. Cultural heritage places and items associated with the heritage of the Sawaga River are hidden lessons bequeathed by past generations.	.558	4.59	Extremely aware
4. The water of the Sawaga River played an important role in the process of prophesying.	1.870	3.85	Moderately aware
5. Beliefs about the sacredness of the Sawaga River have shaped the way that many cultures use it, and this has led to a diversity of practices and technologies.	.588	4.58	Extremely aware
6. The Sawaga River plays a key role in religious imagery and ritual practice in religions all around the world.	.718	4.51	Extremely aware
7. The Sawaga River was one of the most respected and powerful gods of ancient times.	.625	4.43	Moderately aware
8. The Sawaga River is a powerful symbol of rebirth that washes away sin and impurity.	.623	4.38	Moderately aware
	.30270	4.4147	

Table 7 continued.

	SD	Mean	Description
Religious use of the sites			
1. The Sawaga River has important value as a sacred site of worship.	.714	4.39	Moderately aware
2. The ritual in the Sawaga River, dubbed as Panungdan Panalawaig Pamuhat ta Sakub Salubseb, pays respect to the spirits that guard the river and the water that flows through it.	.746	3.89	Moderately aware
3. Rituals in the Sawaga River held every year at the strike of a new moon are important for the tribe as well as the rest of the city as they promote mutual respect, understanding, and unity.	.706	3.69	Moderately aware
4. The tribal leaders used to come to the Sawaga River site for rituals.	.530	4.46	Moderately aware
5. Sawaga River as Heritage Sites are sometimes associated with or imbued with religious or other sacred meaning.	.582	4.51	Extremely aware
6. Religious rules and rituals in Sawaga River often strengthen relationships and are characterized by a conservation ethic.	.551	4.67	Extremely aware
7. Sawaga river is also frequently considered holy, and the areas around it are specially protected from disturbance.	.775	3.75	Moderately aware
8. These spiritual values can come from the beliefs and teachings of organized religion.	.714	4.10	Moderately aware
	.24087	4.1828	

Table 8

Summary of the level of historical landmark and sacred site awareness of students in terms: heritage value of a place, and religious use of the sites

Historical Landmark and Sacred site awareness of students	TOTAL MEAN	Verbal Description
Heritage value of the place (8 items)	4.41	Moderately aware
Religious use of the sites. (8 items)	4.18	Moderately aware
Average mean	4.30	moderately aware

Legend:	Point Value	Verbal Description
5	4.50-5.00	Extremely aware
4	3.50-4.49	moderately aware
3	2.50-3.49	somewhat aware
2	1.50-2.49	slightly aware
1	1.00-1.49	not at all aware

Based on Tables 7 and 8, it was found that the level of historical landmark and sacred site awareness among students is high, or they are moderately aware of this aspect. The students are moderately aware of the place both in terms of its heritage value and its religious use. Under the heritage value of the place criterion, students have the least awareness of the fact that the water of the Sawaga River played an important role in the procedure of prophesying. Moreover, the students are less aware of the Sawaga River being frequently considered holy and that rituals in the Sawaga River held every year at the strike of a new moon are important for the tribe as well as the rest of the city as they promote mutual respect, understanding, and unity.

Buca et. al (2022) study revealed that scientific research on the preservation

and actualization of historical and cultural heritage is retrospective, as a rule, for understandable reasons. Heritage is a prerequisite for consideration in the development strategy of a place, integrating its qualitative characteristics in the direction of preserving the uniqueness and identity of the past while maintaining stability and ensuring the productivity of that place.

The findings of the study support Karadeniz's (2020) statement that it is the responsibility of every individual to ensure the continuity of the cultural assets and values that societies have. One of the important components of the protection of cultural heritage is awareness. In order to ensure the continuity of cultural heritage, awareness, which is one of the important components in the protection of cultural heritage, should be established in every member of society, especially in young people.

4. To determine the level of biodiversity conservation inventory of students in terms of species diversity, water quality, and ecosystem diversity.

Table 9

Level of Knowledge on biodiversity conservation of students in terms of species diversity, water quality, and ecosystem diversity in Sawaga River

	SD	Mean	Description
Species diversity			
1. Sawaga River are highly structured ecosystems in which habitat complexity and heterogeneity are postulated to affect species diversity and abundance.	.574	4.44	Agree
2. Habitat structure in Sawaga River is a major determinant of species variations.	.570	4.41	Agree
3. Variation among Sawaga River habitats in other conditions - in this case flow - may transcend the effects of habitat structure.	.666	4.40	Agree
4. Biodiversity in Sawaga River systems is therefore the most diverse and complex of the world's freshwater bodies.	.601	4.55	Strongly Agree
5. The original flora and fauna of Sawaga River suffered from human impacts like pollution, damming, embankments, and deforestation in the catchment area.	.525	4.49	Agree
6. Introduction of invasive species, dams, and changes to the Sawaga River flow all affect biodiversity.	.598	4.50	Strongly Agree
7. Aquatic biodiversity describes the diversity of species and ecosystems found in and around aquatic habitats like sawaga river.	.683	4.29	Agree
8. Sawaga river is an important habitat for a large variety of animals and plants.	.619	4.52	Strongly Agree
	.24721	4.4509	Agree
Water quality			
1. Aquatic vegetation may also be used as an indicator of water quality in the Sawaga River.	.617	4.38	Agree
2. Higher levels of total suspended solids in the Sawaga River are linked to lower diversity.	.693	4.33	Agree
3. Changes in water quality can have a detrimental effect on Sawaga Rivers.	.643	4.34	Agree
4. Clean water quality in the Sawaga River is vital for ecosystems and the economy.	.577	4.49	Agree
5. The quality of Sawaga River water has a significant impact on human life.	.543	4.51	Strongly Agree
6. Humans use the Sawaga River for irrigation in agriculture, daily necessities such as drinking water, transportation, generating electricity through hydroelectric dams and leisure activities.	.612	4.45	Agree
7. The water quality of the Sawaga River has considerable importance because these water resources are generally used for multiple matters.	.577	4.48	Agree
8. Water quality index is used in the evaluation of surface water quality in the Sawaga River.	.586	4.46	Agree

Table 9 continued.

	SD	Mean	Description
Ecosystem diversity			
1. Ecosystem Diversity in the Sawaga River includes a variety of different habitats, communities, and ecological processes.	.520	4.36	Agree
2. Many factors influence the alpha diversity found in a riverine ecosystem including the age of the Sawaga River.	.574	4.56	Strongly Agree
3. Sawaga River ecosystems are among the most species-rich in temperate regions due to their naturally high habitat heterogeneity and connectivity.	.563	4.56	Strongly Agree
4. All the species living in the Sawaga River -- including fish, bacteria, and many different aquatic invertebrates, such as mayflies, stoneflies, and caddisflies -- are crucial for the functioning of these ecosystems.	.579	4.40	Agree
5. In order to understand and protect riverine ecosystems in the Sawaga River, assessing their biodiversity is essential.	.572	4.58	Strongly Agree
6. Ecosystem diversity addresses the combined characteristics of biotic properties (biodiversity) and abiotic properties (geodiversity) in the Sawaga River.	.708	4.46	Agree
7. Ecological diversity can also take into account the variation in complexity of a biological community in the Sawaga River.	.629	4.47	Agree
8. Broadly speaking, the diversity of an ecosystem is dependent on the physical characteristics of the environment in the Sawaga River.	.641	4.33	Agree
	.21539	4.4658	

Table 10

Summary of the level of biodiversity conservation inventory of students in terms of species diversity, water quality, and ecosystem diversity

Biodiversity Conservation inventory of students	TOTAL MEAN	Verbal Description
Species diversity(8 items)	4.45	High
Water quality(8 items)	4.43	High
Ecosystem diversity(8 items)	4.47	High
Average mean	4.45	High

Legend:	Point Value	Verbal Description
5	4.50-5.00	Strongly agree
4	3.50-4.49	Agree
3	2.50-3.49	Neutral
2	1.50-2.49	Disagree
1	1.00-1.49	Highly Disagree

The results in Tables 9 and 10 show that, on average, there is a high level of biodiversity conservation inventory among students in terms of species diversity, water quality, and ecosystem diversity. The items relating to the introduction of invasive species, dams, and changes to the Sawaga River flow all affect biodiversity and the Sawaga River as important habitats for a large variety of animals and plants, yielding mean scores that reflect a very high level of biodiversity conservation inventory. Among all the considered aspects of water quality, students have a very high level of biodiversity conservation inventory only on the quality of Sawaga River water has a significant impact on human life. And speaking of Sawaga River ecosystems as one of the most species-rich in temperate regions due to their naturally high habitat heterogeneity and connectivity, students have rated this with a high mean score that reflects a very high-level sense of protection, upliftment, and management of biodiversity.

This supports Coracero et. al (2022), study that biodiversity awareness is really important. As an implication of these results, the program curricula of all the degree courses shall be revisited. The administration must assure that students from each degree program are environmentally educated, with an emphasis on biodiversity. It is good that there is already a law that concerns the environmental education. However, it can be more comprehensive and useful if there is a provision highlighting biodiversity education or the focus on biodiversity. It is highly needed since the rich biodiversity in the Philippines continues to decrease over the years. The next generation will be well aware of and concerned about these issues.

Educating students can provide a chance to improve their perspective and value allocation by improving their knowledge, as a number of studies suggest (Venuste et. al, 2017; Lindemann-Matthies et. al, 2014; Nyberg et, al, 2020).

5. To determine the relationship of biodiversity conservation to the instructional participation, environmental awareness, historical landmark and sacred site awareness of students.

Table 11

Relationship of biodiversity conservation to the instructional participation, environmental awareness, historical landmark and sacred site awareness of students

	r-value	p-value
INSTRUC_ACT	.065	.250
FIELDACT	-.015	.789
CLASSACT	.118*	.035*
ONLIACT	.023	.689
ENVIRON_AW	.123*	.028*
NATURE	.113*	.045*
PHLAWS	.088	.118
HISTOR_AW	.092	.101
MONVAL	.022	.690
RELSITE	.127*	.024*

*. Correlation is significant at the 0.05 level (2-tailed).

The relationship of biodiversity conservation to the instructional participation, environmental awareness, historical landmark awareness, and sacred site awareness of students was found to be positively weak. But the only significant associations or relationships that exist with biodiversity conservation are classroom activities, environmental awareness, nature appreciation, and religious use of sites.

6. To identify the variable that best predicts biodiversity conservation on the Sawaga River.

Table 12

Regression Model Summary, Anova, and Coefficients

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	
2	.169 ^b	.029	.022	.15734	

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
2	Regression	.229	2	.115	4.630	.010 ^c
	Residual	7.798	315	.025		
	Total	8.027	317			

The regression model obtained significantly predicts biodiversity conservation since the p-value obtained is less than the significance level 0.05.

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients		Sig.
		B	Std. Error	Beta	t	
2	(Constant)	3.789	.218		17.408	.000
	RELSITE	.080	.037	.121	2.170	.031
	CLASSACT	.073	.037	.112	2.007	.046

The variables that best predict biodiversity conservation on the Sawaga River were classroom activities and religious use of the sites. Biodiversity conservation can be predicted or estimated using the formula $BC = 3.789 + 0.080(RELSITE) + 0.073(CLASSACT)$.

CONCLUSIONS

It can be concluded that students have the interest to participate in the instructional activities conducted relating to the Sawaga River. Their participation was evident in the activities done in the fieldwork, classroom, and online. The students' environmental awareness has influenced their deep understanding of the importance of biodiversity conservation. thus, making them contribute

somehow to the protection, upliftment, and management of biodiversity. Moreover, educating students about the monumental value and religious use of the Sawaga River leads to a significant prediction of the biodiversity conservation of the Sawaga River.

RECOMMENDATIONS

It can be recommended that facts about the historical landmark and sacred site of the Sawaga River be integrated into the instructional activities conducted relating to the Sawaga River. This integration may be employed in the online activities as part of the teacher and student's learning about the Sawaga River.

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