Original Research Article

Water Quality Suitability of Padjadjaran Retention Basin for Aquaculture in Sustainable Floating Pond

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ABSTRACT

Padjadjaran Retention basin is an inland aquatic ecosystem in the form of a water basin that was newly flooded in 2021, located in Cileles Village, Jatinangor District, used as a water storage pond, irrigation source, and fishing. Around the waters there are human activities in the form of fisheries, agriculture, livestock and construction of the Cisumdawu Toll Road which can affect water quality physically and chemically. The purpose of the study was to determine the suitability of the water quality of the Padjadjaran Retention basin for aquaculture with an sustainable floating pond system. Water samples were collected from February to March 2022. The method used in this study is a survey, sampling is carried out using a random sampling method at three stations representing inlets, midlets and water outlets, water Measurement of water samples is carried out insitu which includes temperature, water transparency, pH, Dissolved oxygen and Carbon dioxide and exsitu measurements include Total suspended solid, Total dissolved solid, Ammonia, Nitrite, Hydrogen sulfide and Biochemical oxygen demand at the Aquatic Resources Laboratory of Padjadjaran University and the Tirtawening Environmental Quality Control Laboratory. The data were analysed using the Water Quality Suitability Index (WQSI) according to Costa Pierce et al (1990), water quality standards refer to the Indonesian Government Regulation Number 22 of 2021, and Indonesian National Standard number 6494: 2013. The results showed that the water quality of Padjadjaran Retention basin is suitable for use for aquaculture, the waters located near the outlet are more suitable for the placement of fish farming containers with a suitablity index of 0.53, compared to in the inlet and in the midlet have a suitablity index of 0.18 and 0.17, respectively.

Keywords: Physically, Chemically, Suitability index, Outlet

1. INTRODUCTION

In aquaculture activities the water source used must fulfill the quality requirements of cultivation activities. The quality of the waters that do not correspond to the conditions desired by the fish will not provide maximum production. The quality of water used for cultivation is a factor that affects the growth, breeding and survival of fish so that water quality is the main external factor [1]. Waters that are not in accordance with the conditions needed by fish will affect physiological processes in the fish's body and can trigger stress, causing death. One of the inland public aquatic ecosystems that can be used for aquaculture activities is Retention basin.

Retention basin is one of water ecosystem in the form of an artificial lake obtained from the engineering of rain harvesting and surface water flow [2]. In the Regulation of the Minister of Maritime Affairs of Fisheries Number 9 of 2020, Retention basin includes inland water management areas, which are included in other water groups.

Padjadjaran Retention basin is located in Jatinangor District, Sumedang Regency, West Java with a retention basin area of ± 0.72 hectares (ha), water depth able to reach 5 meters (m) and a capacity of 19,000 meters^3 [3]. Padjadjaran Retention basin is a newly formed water in 2021, Retention basin functions as a water storage pond and is used as irrigation, a source of water reserves for local residents and also fishing. Padjdjaran Retention basin water is sourced from rainwater and surface water flow. In surface watersheds, there are agricultural activities, animal husbandry, fisheries and the construction of Cisumdawu Toll Road projects.

Padjadjaran Retention basin is an inland water that can be used as a place for aquaculture with a sustainable floating pond system, a floating pond system . Water quality is one of the important parts in the development of fish farming so that water quality analysis needs to be carried out [4]. Therefore, research on the Suitability analysis of water quality needs to be carried out for the benefit of developing aquaculture activities sustainable floating ponds.

2. METHODOLOGY

The study was conducted by measuring water quality parameters in-situ in the Padjadjaran retention basin and ex-situ in the Aquatic Resources Laboratory of Padjadjaran University and Tirtawening laboratories, further explanations are presented in Table 1.

Sampling was carried out using random sampling techniques [5]. Water samples were collected from February 2022 to march 2022 and taken into 1.5 L polyethylene bottle from 3 stations on the inlet, midlet and outlet of waters at a depth of 0.3 meters (m). Transparency measurements were analyzed using secchi disk, temperature measurements were analyzed using the thermometer, TDS was analyzed using the gravimetric method [6], TSS was analyzed using gravimetric methods([6], DO was analyzed using DO meters, carbon dioxide was analyzed using titrimetric methods, ammonia was analyzed using spectrophotometric methods[7], pH was analyzed using pH meters, nitrites were analyzed using the spectrophotometric method [7], H_2S was analyzed using the spectrophotometric method [8] and BOD was analyzed using the titrimetric method [9].

Table 1. Water quality measurement location

Parameters	Units	Measurement location
Temperature	^{0}C	In-situ
Transparency	cm	In-situ
TSS	mg/L	Ex-situ[1]
TDS	mg/L	Ex-situ[1]
pH		In-situ
Dissolved Oxygen (DO)	mg/L	In-situ
Carbon dioxide (CO_2)	mg/L	In-situ
Ammonia (NH_3-N)	mg/L	Ex-situ[2]
Nitrite (NO_2-N)	mg/L	Ex-situ[2]
Hydrogen Sulfide (H_2S)	mg/L	Ex-situ[1]
Biochemical Oxygen Demand (BOD)	mg/L	Ex-situ[2]

.[1]Tirtawening Environmental Quality Control Laboratory, [2]Aquatic Resources Laboratory of Padjadjaran University

The evaluation of water quality suitability was carried out by making a value using the Water Quality Suitability Index (WQSI) [10]. This index is made to see and inform the status of water quality quantitatively which is based on applicable standards, Indonesian Government Regulation number 22 of 2021[11] concerning water quality, Indonesian National Standards and literature on water quality which can be seen in table 2.

Table 2. Water Quality Standards

Parameters	Units	Value standards
Temperature	^{0}C	Dev 3 [11]
Transparency	cm	30 [12]
TSS	mg/L	50 [11]
TDS	mg/L	1000 [11]
pH		6-9 [11]
Dissolved Oxygen (DO)	mg/L	4 [11]
Carbon dioxide (CO_2)	mg/L	20 [10]
Ammonia (NH_3-N)	mg/L	0.2 [11]
Nitrite (NO_2-N)	mg/L	0.06 [11]
Hydrogen Sulfide (H_2S)	mg/L	0.002 [11]
Biochemical Oxygen Demand (BOD)	mg/L	3 [11]

WQSI is one of method to giving a score that shows the overall tendency of water from each of the distinctive properties of water quality parameters. To compile the Suitability rating of the observation station from the best to the worst, an analysis was carried out as follows:

1. Calculates the average value of the observation results of each parameter of the entire station.
2. Each average value of the results of such observations is compared with the threshold value of the specified water quality parameters. If the average value of the observation results is outside the threshold range, the intensity of deviation is calculated with the following formula:

$$I = \frac{a - TV}{TV} \times 100\% \qquad (1)$$

I = Intensity of overshoot
a = Observed value parameter exceeding the threshold value
TV = Threshold Value

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3. The number of parameters that are outside the range of threshold values is a constraint factor and is expressed as a potential constraint (C). The greater the constraint factor, the greater the risk of eligibility of a station being low. The value of C can be calculated as follows:

$$C = \frac{The\ number\ of\ parameters\ exceeding\ TV}{The\ number\ of\ observed\ paramters} \times 100\% \qquad (2)$$

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4. Calculate the suitability index (S) of each station with the following formula:

$$S = \frac{1}{\sum I \times C} \times 100\% \qquad (3)$$

S = Suitability index
I = The intensity of deviations from TV
C = potential constraint

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The suitability index (S) is the final score that determines the high and low water quality ratings of all stations. The higher score is the better water quality.

3. RESULTS AND DISCUSSION

3.1 Condition of Retention basin Padjadjaran Waters

The water source of the Padjadjaran retention basin originates from rainwater, runoff water and the flow of the Sekebitung River. The water debit flows to the retention basin during the rainy season can reach 54.68 liters/second with a water volume of ±19000 m^3 [3].The water's depth during the study periods reaches 5 meters, and the water surface visually appears brown after the rain and green on normal days (Figure 1).

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The water colour become to brown due to the large amount of water flow from the terrestrial that carries a load in the form of soil and sand then enters the waters due to the high intensity of rain and the toward of the rainy season in Jatinangor District based on data from the Meteorology, Climatology and Geophysics Agency or BMKG (2022)[13] the rainfall of Sumedang Regency in February to April ranges from 249 mm to 251 mm and days without rain are included in the short category i.e. 6 to 10 days in one month. The high amount of water runoff that enters causes a lot of suspended and dissolved materials to enter the waters such as soil or sand material and other organic materials originating from fishing, agriculture, and toll road construction activities around surface water flows, in line to Effendie (2003)[14] that runoff water will come into contact with the soil and carry and dissolve the dissolved materials contained in the soil into the waters.

Fig. 1. Padjadjaran Retention basin Waters Condition During February to March 2022.

3.2 Physical Quality of Water

3.2.1 Temperature

Water temperature have an important role in the development of fish farming activities. Temperature greatly affects the behavior, metabolism, speed of feeding, reproduction, growth and spread of fish [15]. The results of average temperature measurements during February to March can be seen in Figure 2.

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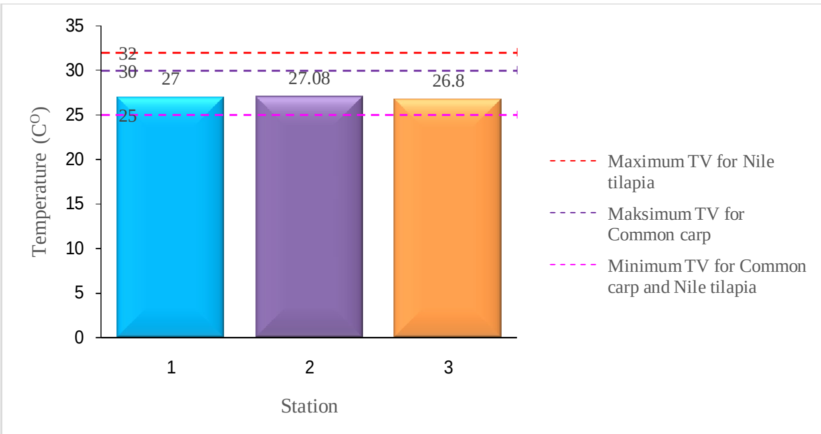

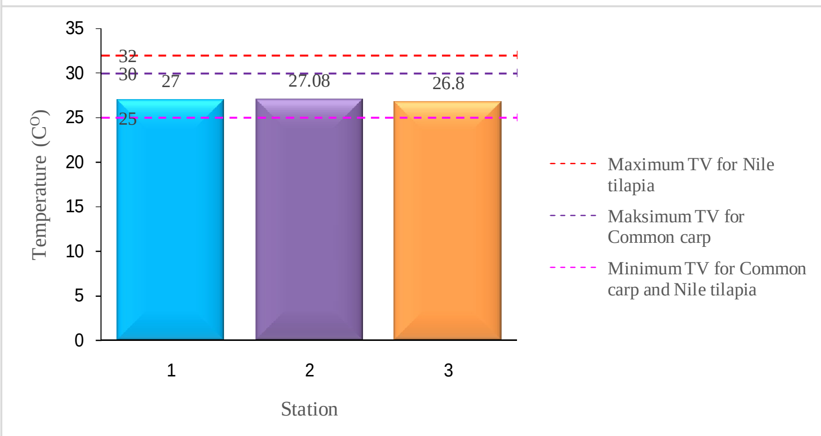

Fig. 2. Average Temperature of Retention basin Padjadjaran Waters During February to March 2022

In Figure 2, it can be seen that the overall temperature value does not show a large variation, the highest temperature at station 2 is 27,08^{O}C and the lowest temperature at station 3 is 26.8^{O}C. according to [9] The ideal temperature for tropical fish ranges from 25^{O}C to 32^{O}C and according to [12]the optimal temperature value for carp culture ranges from 25^{O}C to 30^{O}C is for the cultivation of tilapia in floating net cages [12] the optimal temperature value is from 25^{O}C to 32^{O}C, the average temperature value of the Padjadjaran Retention basin is 26.8^{O}C to 27.08^{O}C so that the temperature of the Padjadjaran Retention basin waters is suitable for aquaculture activities. The temperature value at the Padjadjaran Retention basin is lower than the temperature at the Haliwen Retention basin, which ranges from 29^{O}C to 29.03^{O}C, this is because the Haliwean Retention basin has a wider water surface area of 28 ha with almost the same depth of 4.6 m and the difference in season when measurements were made in September 2016 [2].

3.2.2 Transparency

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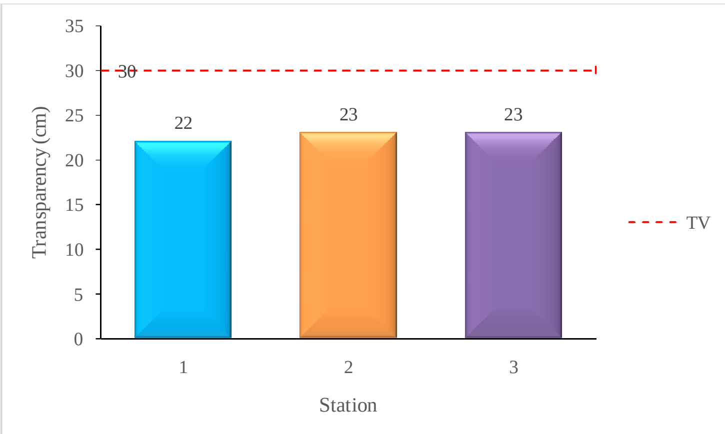

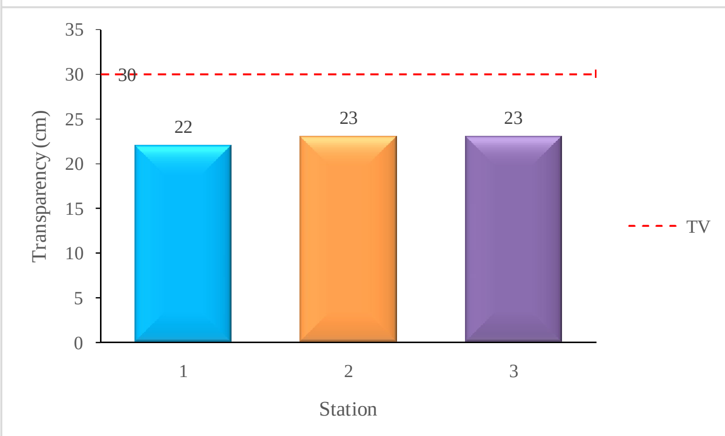

Fig. 3. Average Transparency of Padjadjaran Retention basin Waters During February to March 2022

From the results of measurements during the study, the average values of light transparency at stations 1, 2 and 3 were obtained, namely 22 centimeter (cm), 23 cm and 23 cm as shown in Figure 3. The transparency value at each station is not much different. When measuring the condition of the water is cloudy brown so that it makes light penetration not too deep, this is due to the large amount of runoff water carrying soil particles or sand from littoral areas in the form of open ground with lack vegetation cover and toll road construction around the river which are then dissolved and carried into the waters, in line to Suhendar et al. (2020)[16] the presence of suspended organic and inorganic materials as well as solutes such as mud, fine sand, other microorganisms is something that can affect the brightness of a water the average value of light transparency in each station can be seen in Figure 3

Greater transparency provides higher sunlight penetration , so that the process of photosynthesis can take deeply but the temperature of the waters will be higher [17]. The average transparency in Padjadjaran Retention basin ranges from 22 cm to 23 cm while the light transparency in Unpad Basin ranges from 30 cm to 40 cm [18] which is still suitable for aquaculture based on Indonesian National Standard [12] which is 30 cm, this shows that Padjadjaran Retention basin has water that is quite turbid and is outside the TV range

3.2.2 Total Dissolved Solid (TDS)

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Total dissolved solids consist of dissolved materials in the form of chemical compounds and other materials with a diameter of <6-10 mm that are not filtered on filter paper with a diameter of 0.45 µm [19]. The average results of the TDS measurement of Padjadjaran Retention basin waters can be seen in Figure 4.

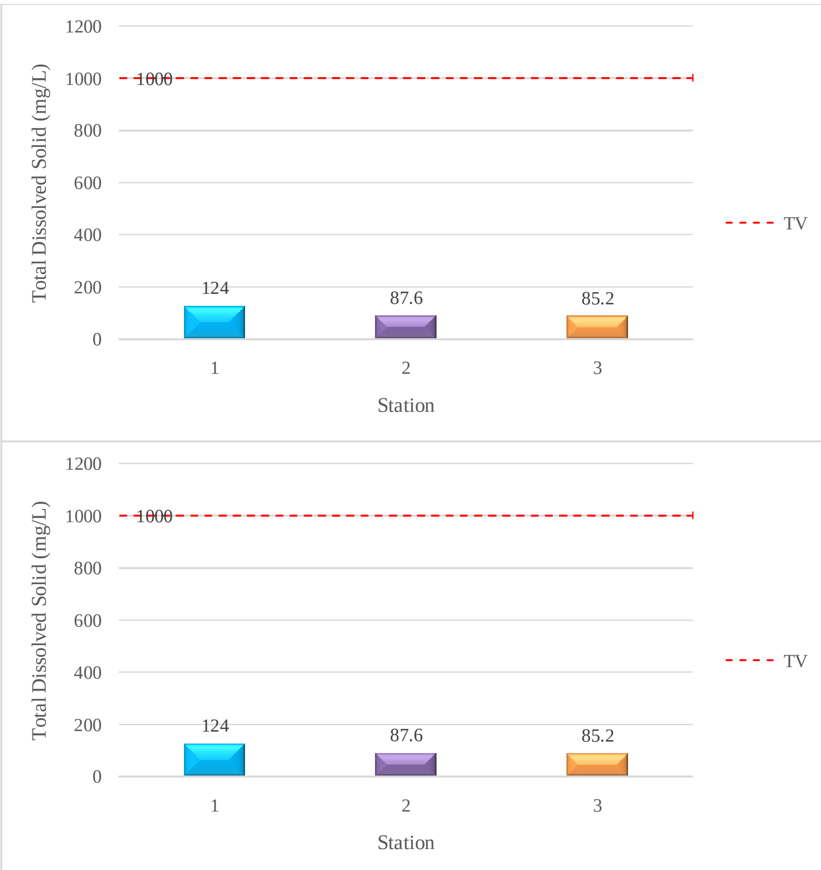

Fig. 4. Average Total Dissolved Solid of Padjadjaran Retention basin Waters During February to March 2022

The results of the average measurement of the TDS value seen in Figure 7 show at station 1 the TDS value is 124 mg/L, at station 2 which is 87.6 mg/L and at station 3 which is 85.2 mg/L, the highest TDS value is at station 1 while at stations 2 and 3 the TDS value has a difference that is not too big. The high level of TDS at station 1 is due to erosion from the littoral area around the waters that carry organic materials from the plantation area, which is the same as what happened in the Waters of Tulamalae Retention basin which has a TDS level of 121.6 mg/L [2]. The TDS value of water is influenced by runoff from the soil and anthropogenic influences such as agricultural and industrial waste [6].

According to Indonesian Government Regulation number 22 of 2021, the TDS value standard for Padjadjaran Retention basin is still under the maximum threshold, meaning that the waters are in accordance with class II water quality standards or are still suitable for aquaculture activities. High levels of TDS can in waters can cause death in aquatic life, and harmful for human health because they contain chemicals with high concentrations including phosphates, surfactants, ammonia, and nitrogen as well as high levels of suspended and dissolved solids, and turbidity [20].

3.2.2 Total Suspended Solid (TSS)

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Total Suspended Solid (TSS) or suspended solids is one of the physical parameters of waters. The high content of suspended solids in waters interferes with the process of sunlight penetration, thus inhibiting the process of photosynthesis. Suspended solids can interfere with the survival of fish, although suspended solids have an important role in providing substrates for microbial communities, suspended solids in high concentrations can increase oxygen demand and reduce fish growth rates [21]. The results of measuring the average TSS value of the waters can be seen in Figure 5.

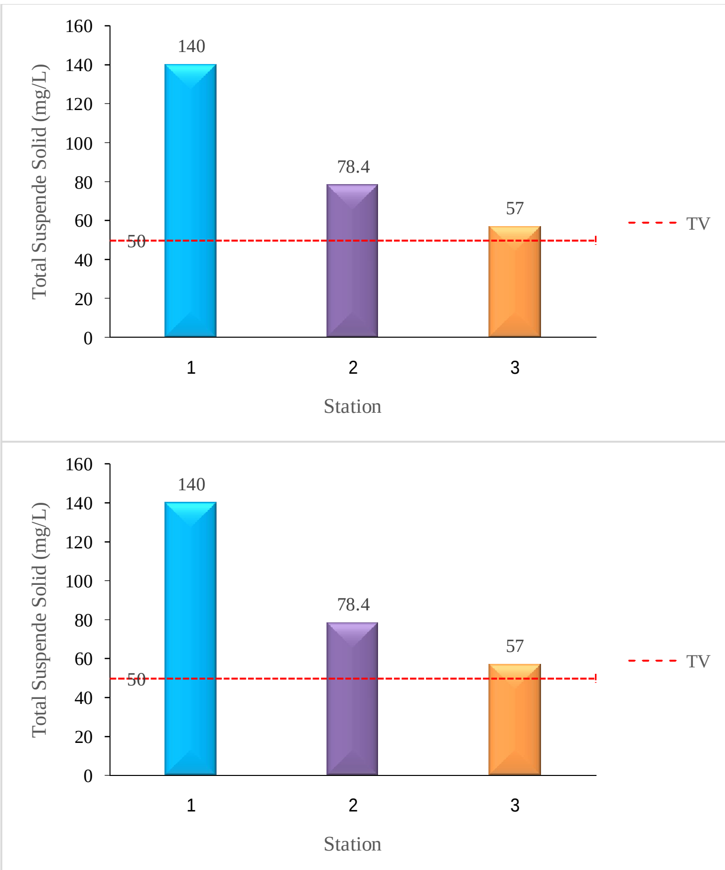

Fig. 5. Average Total Suspended Solid of Padjadjaran Retention basin Waters During February to March 2022

The average of measurement result can be seen in Figure 5, the average TSS value at the station is 140 mg/L, at station 2 which is 78.4 mg/L and at station 3 which is 57 mg/L, the highest TSS value occurs at station 1 and the lowest occurs at station 3, the TSS value in the waters of Padjadjaran Retention basin is higher than the TSS value contained in Situ Bulakan has a TSS value of 16 mg/L to 33.5 mg/L [22]. The high value of TSS is suspected to be due to the new retention basin conditions and the lack of vegetation around the Retention basin area causing soil erosion around the retention basin and toll road construction activities that carry soil or sand materials supported by rain so as to make a large load of soil and sand suspended carried into the waters. TSS is a suspended material that causes turbidity of water consisting of mud and sand carried away by erosion [6].

Based on Indonesian Government Regulation [11], the maximum TSS level value in fresh water for fish farming activities, namely 50 mg/L, the TSS level value at each station has exceeded the maximum threshold for fish farming activities so that it is quite dangerous for fish survival because it can be filtered on fish gills and interfere with the respiration process [6].

3.3 Chemical Quality of Water

3.3.1 Dissolved Oxygen (DO)

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Dissolved oxygen is needed by all remains for the process of breathing, metabolism or exchange of substances that then produce energy for growth and breeding [23]. The concentration of oxygen in the waters is influenced by the diffusion activity of water, mechanical aeration, temperature and the process of respiration and photosynthesis [24].

The results of measuring the average value of oxygen concentration at station 1 is 5.32 mg/L at station 2 is 5.23 mg/L and at station 3, which is 5.36 mg/L, this can be seen in Figure 9. The difference in oxygen concentration is not so large and significant. The dissolved oxygen content of Padjadjaran Retention basin has a value that is not much different from the DO level in the waters of Unpad Basin, which ranges from 5.2 mg/L to 6 mg/L [18]and is also not much different from the Retention basin ex Clay Excavation which has a DO level of 5.9 mg/L. The concentration of dissolved oxygen at each station is still above the TV, which is 4 mg/L so that it is still safe for aquaculture activities.

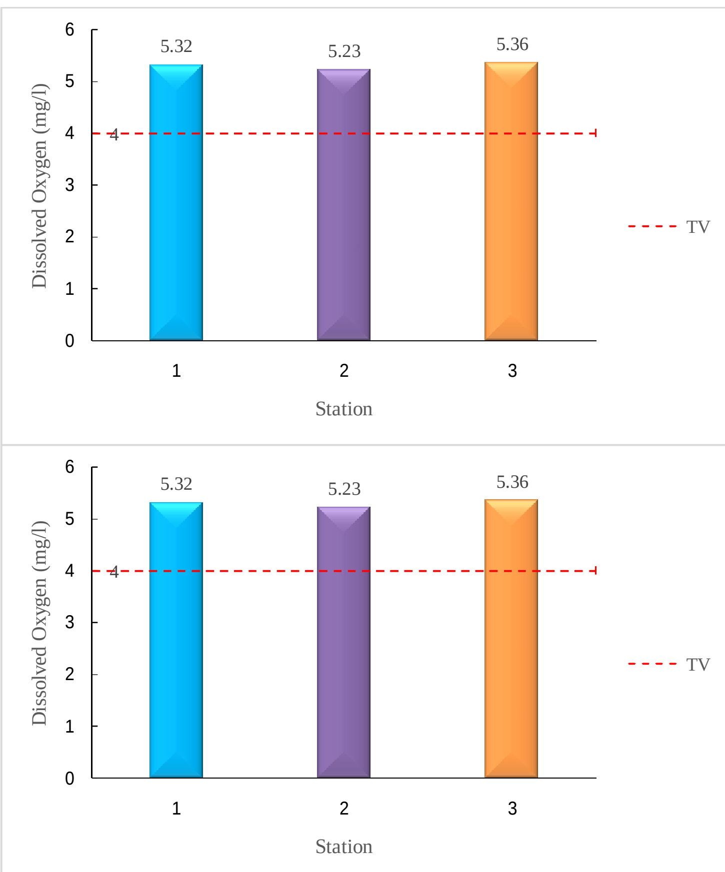

Fig. 6. Average Dissoloved Oxygen of Padjadjaran Retention basin Waters During February to March 2022

3.3.2 Carbon dioxide (CO_2)

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The high amounts of carbon dioxide can affect the respiration process of organisms in the waters but the availability of carbon dioxide in small amounts will affect organisms in the process of photosynthesis. The increase in CO^2 concentration occurs due to the activity of respiration and decomposition of organic matter while the decrease in CO^2 occurs due to the process of photosynthesis [25]. The average CO2 concentration value of The Padjadjaran Retention basin waters during February to March can be seen in Figure 7.

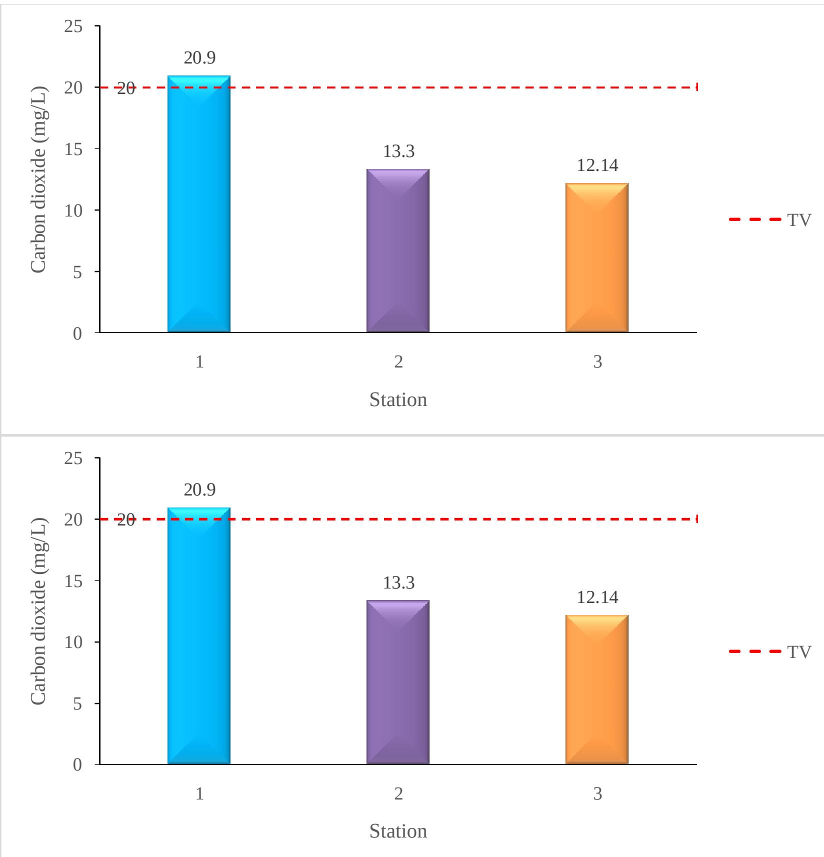

Fig. 7. Average Carbon dioxide of Padjadjaran Retention basin Waters During February to March 2022

The average concentration of carbon dioxide at each station can be seen in Figure 7. On average, the measurement results showed the highest CO_2 concentration of 20.9 mg/L at station 1, this happened because station 1 is an inlet channel that contains a lot of dissolved solids that do not precipitate and inhibited the photosynthesis process. At stations 2 and 3, the average values of 13.3 mg/L and 12.14 mg/L have a difference value that is not so large because at stations 2 and 3 the movement of water is not very active so that many suspended solids such as soil or sand have precipitated so that the penetration of incoming sunlight is greater and facilitates the process of photosynthesis.

The CO_2 value in the Padjadjaran Retention basin waters is smaller than the CO_2 levels in the Klamalu Retention basin waters, which ranges from 25.9 mg/L to 28.9 mg/L [26]this is because in Klamalu Retention basin there are domestic waste discharges and mining excavation C. The average CO_2 value at station 1 has exceeded the threshold (TV) so that station 1 is not safe enough for fish survival. The maximum CO_2 level for carp culture is 20 mg/L at pH conditions 5-6, at these levels fish are able to survive but their growth is disturbed, while at CO2 levels exceeding 25 mg/L can cause death in fish [10].

3.3.3 Potential Hydrogen (pH)

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The average result of the pH value during measurements can be seen in Figure 8 at station 1, the average pH is 6.16 at station 2, which is 6.33 and at station 3, which is 6.26. the average pH difference at each station is not so large and significant. Padjadjaran Retention basin has a smaller pH value compared to the pH in the Clay Excavated Ex-Excavated Retention basin, which ranges from 7 to 8 [27]. High low pH levels are caused by the presence of organic matter containing ammonia, causing pH to tend to be alkaline and the presence of rainwater entering, an increase in CO^2 and H_2S concentrations causes pH to tend to be acidic. The water source of Padjadjaran Retention basin originate from runoff water and rainwater it generally has a low pH, which is 4.2 so that it can cause a decrease the pH of the waters [14]. The optimal pH range for fish culture in Government Regulation [11] is 6 to 9. The cultivation of carp culture in floating net cages [12] which ranges from 6-8.6 and for the tilapia culture in floating net cages which ranges from 6-8.5[12]. The pH value at each station does not exceeding the TV, so the pH of the Padjadjaran Retention basin water is still safe for fish culture.

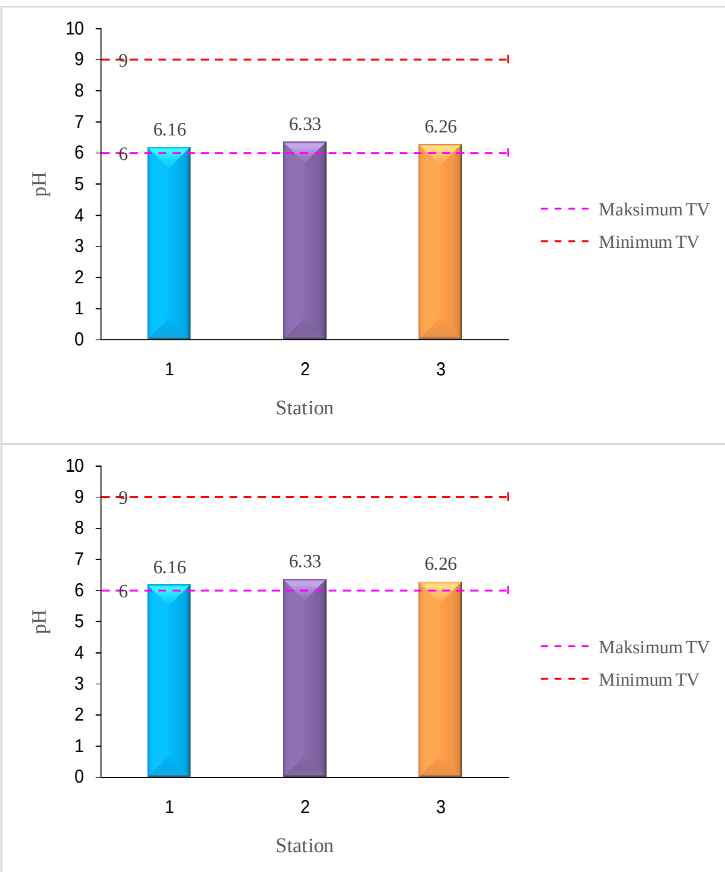

Fig. 8. Average pH of Padjadjaran Retention basin Waters During February to March 2022

3.3.4 Ammonia (NH_3)

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In Figure 9, it can be seen that the average ammonia at station 1 is 0.025 mg/L, at station 2 is 0.004 mg/L and at station 3 ia 0.0051 mg/L. the highest NH_3 level is at station 1 this is because station 1 is the main inlet canal of the water so that a lot of organic matter coming from the flow of runoff water is collected. The NH_3 value in Padjadjaran Retention basin is smaller than in Situ Bulakan which ranges from 2.06 mg/L to 3.03 mg/L, the high ammonia levels are due to the large amount of feed waste that settles and the results of fish metabolism in the waters [22]. Ammonia generally sourced from the decomposition of residual organic matter and metabolic byproducts of aquatic organisms. The higher the organic matter in the waters, the higher the ammonia concentration [28]. The average NH_3 value at each station is still below the TV so that ammonia levels in the waters are still safe for fish survival.

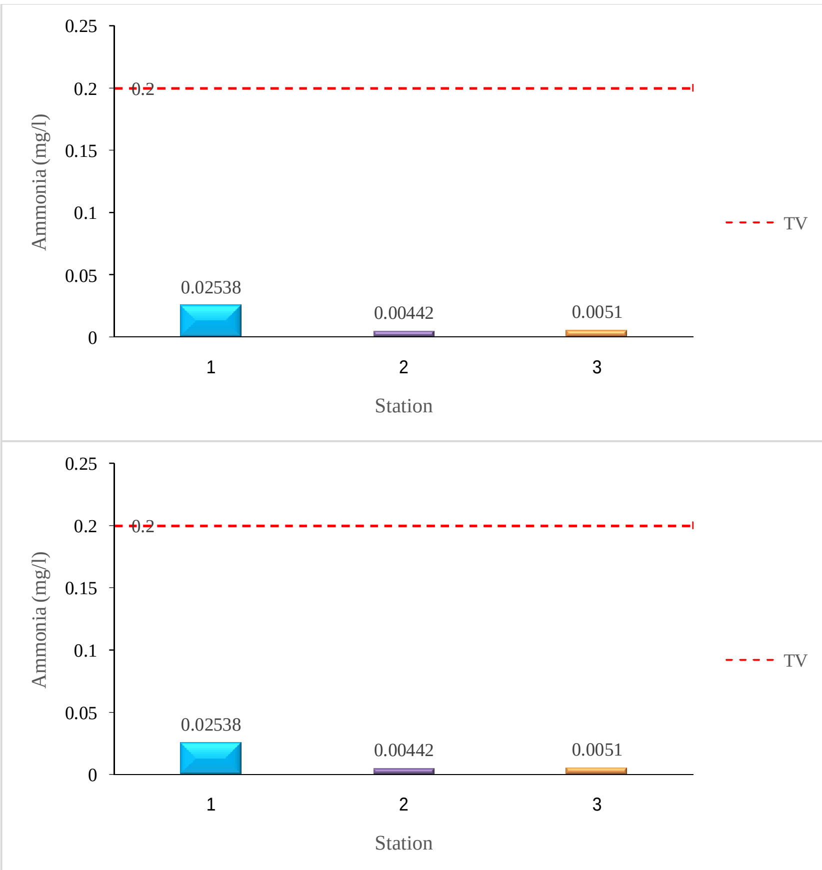

Fig. 9. Average NH_3 of Padjadjaran Retention basin Waters During February to March 2022

3.3.5 Nitrite (NO_2)

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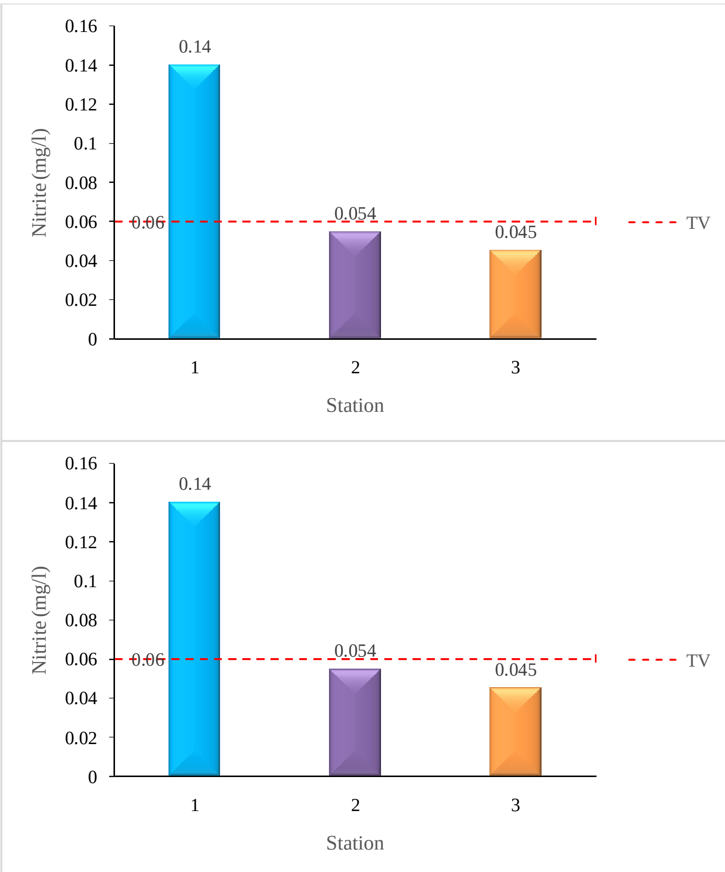

Fig. 10. Average Nitirite of Padjadjaran Retention basin Waters During February to March 2022

Based on the average measurement of water nitrites at station 1 of 0.14 mg/L, at station 2 of 0.05 mg/L and at station 3 of 0.04 mg/L. the highest concentration of nitrites at station 1 this is because station 1 is the area of the main inlet channel of the waters so that it contains a lot of organic matter carried away from the water flow. The concentration of NO_2 levels is influenced by the oxidation process of ammonia to nitrates sourced from waste from fisheries, agriculture and also other domestic activities [28]. The nitrite content in The Padjadjaran Retention basin is not much different from the nitrite rate in the Jatiluhur Reservoir which ranges from 0.01 mg/L to 0.15 mg/L, the high level of nitrites is due to the large amount of industrial waste and domestic waste into the waters [29]. The average value of nitrite can be seen in Figure 11.

The nitrite level at station 1 has exceeded TV so that the nitrite value in the Waters of Padjadjaran Retention basin is not safe for fish survival, Nitrite rate that exceed 0.05 mg/L can cause toxicity for aquatic organisms because they can react with fish hemoglobin so that it interferes with the oxygen binding process [30].

3.3.6 Hydroge Sulfide (H_2S)

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The average hydrogen sulfide (H_2S) levels during measurements in February to March 2022 can be seen in Figure 11.

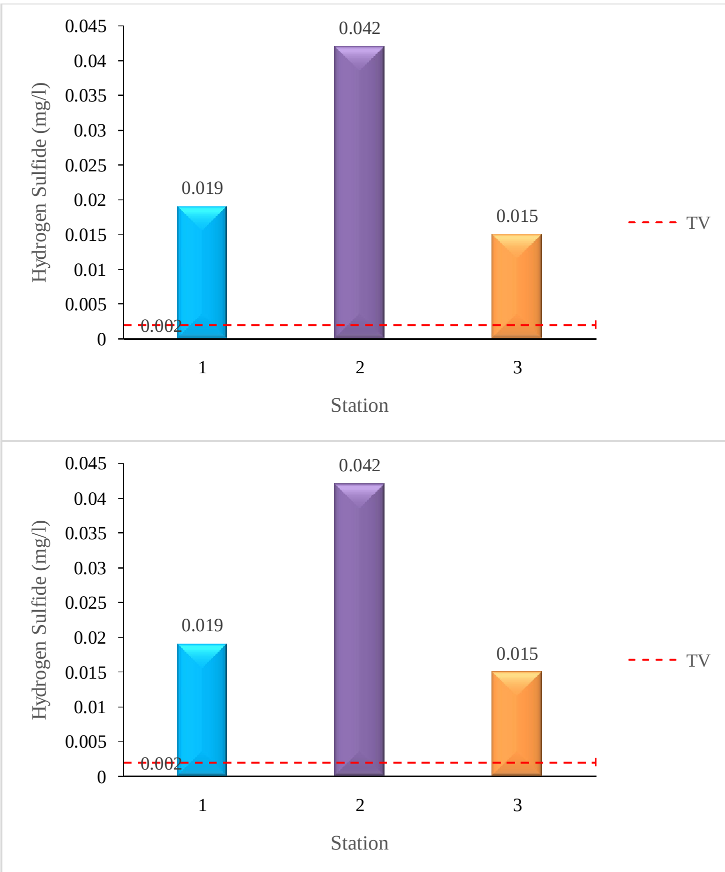

Fig. 11. Average H_2S of Padjadjaran Retention basin Waters During February to March 2022

At station 1 the H_2S value was 0.019 mg/L, at station 2 it was 0.042 mg/L and at station 3 it was 0.015 mg/L. the highest H_2S level occurred at station 2 and the lowest level occurred at station 3. High levels of H_2S also occur in Lake Paniai, which is 0.15 mg/L to 0.19 mg/L which is caused by the anaerobic degradation process of waste into the waters [31]The low transparency value in the waters inhibited the photosynthesis resulting a lack of oxygen supply. If the level of dissolved oxygen in the waters is insufficient for the decomposition process, the process will switch to an anaerobic process and make sulfate a source in the decomposition process so as to produce hydrogen sulfide gas [32]. The average value of H_2S levels at each station has exceeded TV so that H_2S levels in the waters of The Padjadjaran Retention basin are not safe for fish survival, H_2S levels exceeding 0.5-0.7 mg/L can cause death in fish [10].

3.3.7 Biochemical Oxygen Demand (BOD)

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Biochemical Oxygen Demand or BOD is the amount of oxygen required by microorganisms to break down organic matter in waters so that the higher the BOD value indicates the higher the amount of decrease in dissolved oxygen in the waters. The average BOD value carried out in the range from February to March 2022 can be seen in Figure 12.

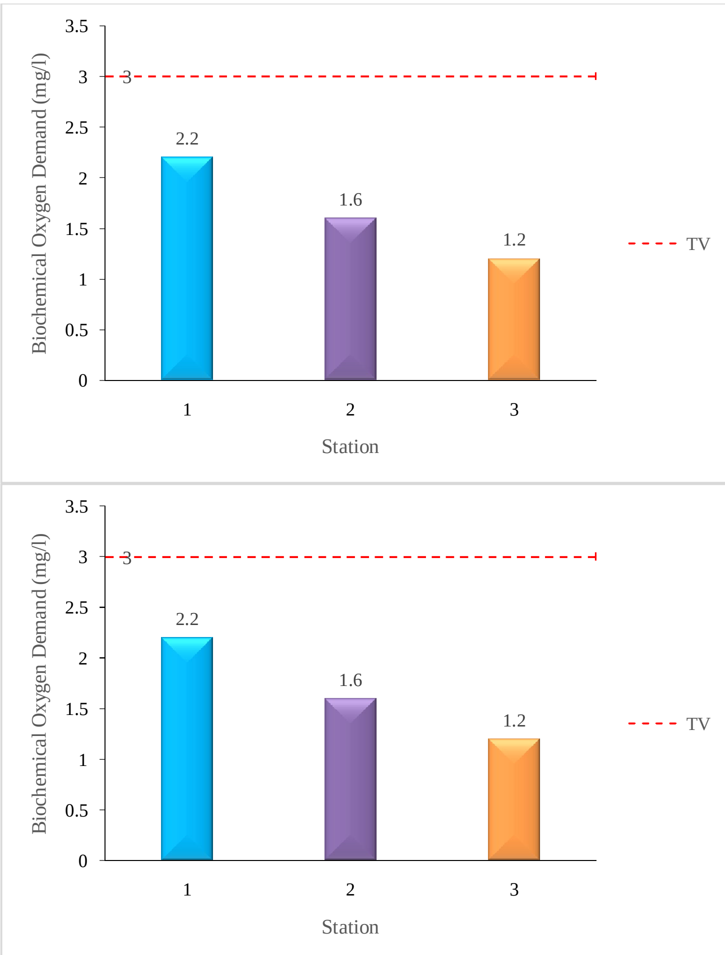

Fig. 12. Average BOD of Padjadjaran Retention basin Waters During February to March 2022

The highest BOD measurement results occurred at station 1, which was 2.2 mg/L and the lowest value was at station 3 of 1.2 mg/L. BOD value was influenced by the amount of waste or organic matter entering the waters, organic matter contained in the Padjadjaran Retention basin was suspected to come from waste from fish farming activities, agricultural litter waste and other anthropogenic waste carried away by water runoff. The value of BOD is influenced by the amount of waste discharged into the waters. The waste increase the amount of organic matter in the water, the organic matter will be decomposed by microorganisms using oxygen for biodegradation or biochemical processes so that it will cause a decrease in dissolved oxygen levels in the waters [33]. The BOD value contained in the Padjadjaran Retention basin is smaller than in the Margodadi Retention basin, which is 4 mg/L to 6 mg/L which is caused by the large amount of waste carried by the river flow [34], this shows that pollution in the Padjadjaran Retention basin is lower.

Based on Government Regulation number 22 of 2021[11], the minimum limit for the amount of BOD for class II water quality standards is 3 mg/L so that the BOD value at each station is still safe for fish survival because it is still below the TV, which is 3 mg/L.

3.2 Suitability Water Quality

Water quality measurement or WQSI [10] is a method developed for fish farming development activities in floating net cages, this method takes into account water quality parameters that exceed or exceed the threshold range for fish survival and growth. The amount that is outside the TV range is expressed as a constraint factor or potential constraint. Station 1 has five parameters that are outside the TV range while stations 2 and 3 have three parameters that are outside the TV range. The results of water quality measurements obtained during the research time presented in Table 3.

Table 3. Water Quality Deviation Intensity Value

Parameters	Station	A	TV	α-TV	(α-TV)/TV	I (%)
	1	27	Dev 3	0	0	0
Temperature	2	27.08	Dev 3	0	0	0
	3	26.8	Dev 3	0	0	0
	1	22	30	8	0.27	27
Transparency	2	23	30	7	0.23	23
	3	0.23	0.3	7	0.23	23
	1	124	1000	0	0	0
TDS	2	8.6	1000	0	0	0
	3	85.2	1000	0	0	0
	1	140	50	90	1.80	180
TSS	2	78.4	50	28.4	0.57	57
	3	57	50	7	0.14	14
	1	5.32	4	0	0	0
DO	2	5.23	4	0	0	0
	3	5.36	4	0	0	0
	1	6.16	6-9	0	0	0
pH	2	6.33	6-9	0	0	0
	3	6.26	6-9	0	0	0
	1	20.9	20	0.9	0.04	4
CO_2	2	13.3	20	0	0	0
	3	12.14	20	0	0	0
	1	0.025	0.2	0	0	0
NH_3	2	0.004	0.2	0	0	0
	3	0.005	0.2	0	0	0
	1	0.14	0.06	0.08	1.33	133
NO_2	2	0.055	0.06	0	0	0
	3	0.045	0.06	0	0	0
	1	2.2	3	0	0	0
BOD	2	1.6	3	0	0	0
	3	1.2	3	0	0	0
	1	0.019	0.002	0.017	8.50	850
H_2S	2	0.042	0.002	0.04	20	2000
	3	0.015	0.002	0.013	6.50	650

The results of calculations using the WQSI method obtained an S value at each station, the higher the value, the better the suitablity of water quality. The S value of the three stations, station 3 got the first rank with an S value of 0.53, the second rank of station 1 with an S value of 0.18 and station 2 got the last rank with an S value of 0.17, so that the order of Suitability of water quality for fish farming was sequentially, namely station 3, station 1 and finally station 2. The result of the calculation of the value of S can be seen in Table 4.

Table 4: Suitability Index at each station

Station	intensity of deviations I (%)						Potential Constraint		S	Ranking
	Transparency	TSS	CO_2	NO_2	H_2S	∑I	N	%		
1	27%	180	4	133	850	1195	5	45	0.186	2
2	23%	57	0	0	2000	2080	3	27	0.176	3
3	23%	14	0	0	650	687	3	27	0.533	1

4. CONCLUSION

The results of the water quality suitability of Padjadjaran Retention basin showed that station 3 has the best water quality suitablity to be used as a aquaculture place in sustainable floating pond with a temperature value of 26.8^{O}C, transparency 0.23 m, total dissolved solid 85.2 mg/L, total suspended solid 57 mg/L, dissolved oxygen 5.32 mg/L, pH 6.26, carbon dioxide 12.14 mg/L, ammonia 0.0051 mg/L, nitrite 0.04 mg/L, biochemical oxygen demand 1.2 mg/L and hydrogen sulfide 0.015 mg/L then the S value obtained was 0.53. However, the value of the transparency and concentration parameters of H_2S is still not suitable for fish farming activities.

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