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Physicochemicals Properties for *Toyyib* Environmental Assessment on Lake Water Quality: A Mini Review

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Abstract

As Malaysia strives to become industrialised, numerous water bodies are increasingly dumping grounds for chemicals, sewage, and pollutants. It is considered that pollutant substances are continuously channelled into water bodies and then transferred into organic and inorganic particles, nutrients, pesticides, and herbicides that directly affect the aquatic ecosystem. This paper aims to study the overview of physicochemicals properties for lake water quality in relation to *Toyyib* environmental assessment. Malaysian water quality assessments are based on several rules, including the National Lake Water Quality Criteria and Standard, Urban Storm Water Management Manual for Malaysia, and National Water Quality Index Standard. As a result of the transmission of physicochemical qualities, water contaminants inflict harm not only on aquatic ecosystems but also on the safe water for human use. These studies indicate the water quality measurements or parameters for assessing the water quality for the *Toyyib* environment and establish the list of physicochemical properties for water quality assessment on the lake. On the other hand, the methodology applied for each parameter was also studied and presented.

Keywords:
Water quality; Environmental assessment; Lake water quality

1. Introduction

The National Institute of Hydraulic Research Malaysia reported that more than 60% of the ninety lakes examined were eutrophic (Sharip, Zaki, Shapai, Suratman, & Shaaban, 2014). The source of pollution in urban areas includes artificial and natural surface runoff, such as soil, which acts as a medium for the pollutants to enter the water body. Besides, according to the Malaysia Environmental Quality Report, the most influential sources of water pollution in Malaysia were anthropogenic: suspended solid (SS), ammoniacal nitrogen (NHO_3) and biochemical oxygen demand (BOD). Typically, a water supply's physical, chemical and biological characteristics are utilised to evaluate its quality (Danjuma, 2019). In tropical developing nations where treating effluents before discharging them into water bodies is not a priority, the deterioration of water quality has been a troubling problem. According to Environmental Report (2022), studies on this particular category for Malaysia currently need to be made available. Hence, *Islam* clarifies that Muslims must be earth stewards (*Khalifah*). Therefore, the discussion has brought together the *Islam*ic perspective on the importance of water in *Islam*, the religious duty for water management, and the relationship to the *Toyyib* environment in water issues.

Manufacturing Practices (GMP) (Mansor *et al.*, 2020). So, in *Halal* cosmetics, the *Halalan Toyyiban* concept covers critical aspects of product preparation, including selecting ingredients, processing, packaging, storing, and delivering to consumers (Mansor *et al.*, 2017).

In Malaysia, the production of *Halal* cosmetics has become a trend among local cosmetic manufacturers as they are keen to dominate the market and come out with a wide range of product types to seek and satisfy clients (Abdullah *et al.*, 2020). Therefore, the growing knowledge and awareness regarding *Halal* cosmetic products are drastically changed to meet the local market's demand and supply. However, international companies unsurprisingly rule Malaysia's cosmetics and beauty items (Zakaria *et al.*, 2019; Kaur *et al.*, 2018). Hence, despite the understanding of *Halal* products, many Muslim consumers remain loyal to uncertified *Halal* cosmetic products because many products are imported and do not have *Halal* certification (Ngah *et al.*, 2021).

In short, as soap consumption has increased due to the Covid-19 pandemic, it is essential to know the *Halalan Toyyiban* concept in soap production to ensure the quality and safety of the product. Thus, this paper was written to study the concept of *Halalan Toyyiban* in soap production. This paper focuses on the soap for cosmetic uses, not for general uses. This paper adopts qualitative methods to collect information from articles and journal sources. This paper discusses three main topics: the overview of soap, the *Halalan Toyyiban* concept in soap production, and *Halal* cosmetics in Malaysia.

2. *Toyyib* environment towards water quality

Toyyib environments are not often used in environmental quality status, but they represent a safe and healthy environment based on risk assessment. As stated in *surah al-Mukminun*, verse 51, *Toyyib* means clean and pure. *Islam* recognised water as the source of life for the entire universe. This conclusion is supported by information highlighted in the *Qur'an* regarding the significance of water. *Allah SWT* created all living things entirely, as mentioned in the *Qur'an* in *surah al-Anbiya,* verses 30:

> *"Do not the unbelievers see that the heavens and the earth were joined together before we clove them asunder? We made from water every living thing. Will they not then believe?" (Qur'an,* 21:30*)*

Water is a medium of understanding, faith, and wisdom essential to *Islam*'s physical and spiritual practice. It is important to show how our *Islam*ic faith protects and cherishes the planet (Abdul Matin & Elisson, 2010). Water transfixes us with its beauty and frightens us with its awesome destructive force, serving as a constant and reliable sign of the creator. In *Islam*ic Jurisprudence, water is a vital element that bestows privileges on all living things. *Al-Qaradawi* has elucidated the principles of *Islam*ic Jurisprudence regarding the environment associated with water by the *Qur'an*, which includes five components; *Tashjir and Takhdir* (Planting and Greening),' *Imarah and Tathmir* (Sustainable Development), *Nazafah and Tathir* (Cleanliness and purification), natural resources and biodiversity conservation and health sustenance, as cited in Istajib & Abdullah (2014).

As evidenced by *Allah SWT* repeated reminders in the Qur'an, these elements constitute a critical relationship to the human's religious obligation regarding water. For instance, in *surah al-Annam,* verse 66 states:

> *"And it is He who sends down rain from the sky, and we produce vegetation of all kinds. We produce from it greenery from which We produce grains at harvest, And from the palm tree of its emerging fruit are clusters hanging low. Moreover, We produce a garden of grape vines, olives and pomegranates, similar yet different. When they begin to bear fruit, feast your eyes with the fruit and the ripeness thereof. Behold, in that, are signs for a people who believe." (Qur'an,* 6:99*)*

At the end of the verse, *Allah SWT* emphasised that all creatures are a sign for those who owe him obedience. As mentioned in *surah Hud*, verse 6, when *Allah SWT* had created all the things that are necessary for humans to ensure the safe and sustainable management and development of the environment:

> *"And to Thamud, We sent their brother Salih. He said, "O, my people, worship Allah; you have no deity other than Him. He has produced you from the earth and settled you in it, so ask forgiveness of Him and then repent to Him. Indeed, my Lord is near and ready to answer." (Qur'an,* 11:61*)*

As *Allah SWT* created all creatures on the earth for the benefit of humanity, people should show their gratitude to *Allah SWT* by managing the environment following the rules and regulations in the *Qur'an* and to please *Allah SWT*. The destruction of the environment is not a natural occurrence unrelated to human activities, as justified in *surah ar-Rum* verse 41:

> *"Mischief has appeared throughout the land and sea by reason of what the hands of men have earned so Allah may give them a taste of some of their deed in order that they may turn back from evil."* (*Qur'an*, 30:41)

The verse shows that human activities will lead to the effect of corruption. Thus, the subject of cleanliness and purification, natural resources and biodiversity conservation, and health sustenance is relevant to be emphasised in the *Toyyib* environment regarding the religious duty on environmental management, including water safety and health risk.

3. Water issues

Water is a part of the environment that provides many benefits to humans, society, and the earth system to support the living environment. It is a basic unit of life, and it has a complex and multidimensional concept, ranging from the global circulation system to a single human cell. In the new globalisation era, however, everyone is engaged in a battle to control water resources. Only a few categories of water usage contribute to water challenges, such as domestic use, industrial, agriculture, food production, etc. Water is a fundamental substance for human life. The ever-increasing water crisis compels humans to develop many innovative methods for predicting future environmental conditions and preventing the loss or depletion of natural resources. In the first half of the 20th century, the world begins to pay attention to the scarcity of natural resources due to the rise in global populations and resource consumption (Schmidt, 2019).

Moreover, the various activities in high population areas, such as urban areas, determine the social and economic impact on the environment, including the water bodies. Urbanisation is growing as a result of the population rising. The site has been employed for economic advantage based on the potential natural features ideal for any physical development, such as dwelling, business area, institution, public park, and public transportation route, to satisfy human requirements. This kind of land use, which will transform into an urban area, will influence the source of water pollution.

3.1 Point sources of pollution and nonpoint sources of pollution

Most point source contamination originates from industrial wastewater and municipal sewage discharges from urban or densely populated regions (from various manufacturers)

(Kèm, Nhơn, Ahmad, Gang, & Sakib, 2018). This definition was supported by Singh & Gupta (2017), who described point source pollution as a source that can be directly identified. As described in Environmental Quality Report 2022, point sources are defined as sources of pollution with definite, recognisable discharge sites that remain fixed over time. These sources include industries, agriculture, and sewage treatment systems.

Wu *et al.* (2015) have described nonpoint source pollution as originating from diffuse sources such as urban runoff and soil erosion, which affect receiving waters such as lakes, rivers or reservoirs caused by leaching and erosion of rainfall runoff, agricultural as well as anthropogenic activities (Ridolfi, 2016). Wang *et al.* (2015) found that agricultural nonpoint source pollution contributed between 68% to 83% of the total pollution, including nitrogen, phosphorus, nutrients, and organic and inorganic pollutants exposed to surface runoff. According to Zhang *et al.* (2013), another factor affecting nonpoint sources is improper land use structure and management, leading to soil erosion and pollutant-induced water eutrophication.

3.2 Source of water pollution in Malaysia

Water pollution load is one of the most critical factors that must be considered when prioritising and planning pollution prevention and control strategies. The sources of pollution come from natural sources, most of which are the result of human activity (Afroz, Masud, Akhtar, & Duasa, 2014).

According to Environmental Quality Report (2020), there are three significant effects of environmental pollution load in water sources Biochemical Oxygen Demand (BOD), Ammoniacal Nitrogen (NH3N), and Suspended Solid (SS). On top of that, the findings by (Camara, Jamil, & Abdullah, 2019) showed that 87% of the studies that were analysed identified urban land use as a significant cause of water pollution, compared to 82% that identified agricultural land use, 77% that identified forestry use, and 44% that identified other land uses. All of these are a result of human activities.

4. Lake water quality in Malaysia

Due to its climate, Malaysia is one of the countries that receive high levels of rainfall every year. As part of water management, lake catchments are necessary to balance the ecosystem in a region, state, rural, and urban area. However, rapid development has significantly affected the quality standard of the lake in Malaysia.

4.1 National lake water quality criteria and standards

The National Hydraulic Research Institute of Malaysia (NAHRIM) and the Ministry of Natural Resources and Environment of Malaysia has developed the National Lake Water Quality Criteria and Standard (NRE). This standard is intended to establish specific water quality criteria and provide the information necessary for the lake quality assessment prior to lake categorisation, such as recreational activities or ecosystem health. In addition, this standard serves as a basis for conducting lake research in Malaysia in a manner that is non-deteriorating and yet improves the environmental quality. According to National Lake Water Quality Criteria and Standard (2015), the classification of lakes is based on four monitoring parameters: physical, nutrients, biological, and microbiological measurements and other measurements such as heavy metal. Besides, the categorisation of the lakes is divided into four, as shown in Table 1.

For category A, the lake water quality is managed for the primary body contact recreation such as swimming and must be free from water-borne diseases; hence, additional microbiological parameters must be measured. In category B lakes, however, the water quality is managed for secondary body contact recreation, such as cruising, and direct body contact activities are prohibited, as microbiological and water-borne diseases measurement is not required. A category C lake is managed to preserve aquatic life and biodiversity as part of a healthy lake and ecosystem. The main parameter measured is physical parameters, nutrients, and heavy metals. Category D requires the minimum preservation for aquatic life, as all possible pollutants must be removed. The parameters are listed in Tables 2 and 3. Other optional parameters for measuring the lake water quality include calcium ion, chloride, fluorine, nitrite, sulphate, etc. The required values are varied depending on the category of the lake. In addition, the concentration of heavy metals is an essential criterion for determining the toxicity of water, as shown in Table 2.

Table 1: Description of lake categories

NO.	CATEGORIES	DESCRIPTION
1	CATEGORY A	Lakes are managed where the water is used for recreational purposes - primary body contacts such as swimming, diving and kayaking.
2	CATEGORY B	Lakes are used for recreational purposes - secondary body contacts such as boating and cruising. Swimming is not allowed in this category of lakes.
3	CATEGORY C	The lakes are meant for the preservation of aquatic life and biodiversity.
4	CATEGORY D	Lakes are managed for the minimum preservation of good aquatic life in the lakes.

4.2 National water quality standard for Malaysia

Furthermore, the National Water Quality Standard for Malaysia also consider the same parameters as the lake quality assessment, as shown in Table 4, and a few additional parameters, such as heavy metals, as shown in Table 5.

4.3 Urban storm water management manual for Malaysia

Another initiative taken by the Government of Malaysia through Department of Irrigation and Drainage in controlling the adverse impact on the water bodies such as lake in the urban area is the Urban Storm Water Management Manual for Malaysia (MSMA 2nd Edition). This guideline is produced to minimize the adverse impact such as water pollution, ecological damage, erosion, etc. According to (Department of Irrigation and Drainage-DID, 2012), there were a list of pollutants estimation that come from the nonpoint source (NPS) and typically found in the urban area such as gross total suspended

Table 2: The measurement parameter for heavy metals concentration for lake water quality criteria and standard

PARAMETER	UNIT	CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY D
Aluminium (Al)	mg/L	0.1	0.1	0.05	0.05
Antimony (Sb)	mg/L	0.03	0.03	0.03	0.03
Barium (Ba)	mg/L	0.1	0.1	1	1
Berylium (Be)	mg/L	0.004	0.004	0.004	0.004
Boron (B)	mg/L	1	1	1	1
Chromium (Cr)	mg/L	0.05	0.05	0.05	0.05
Cobalt (Co)	mg/L	0.05	0.05	0.05	0.05
Copper (Cu)	mg/L	0.02	0.02	0.02	0.02
Iron /Ferum (Fe)	mg/L	1	1	1	1
Magnesium (Mg)	mg/L	150	150	150	150
Manganese (Mn)	mg/L	0.1	0.1	0.1	0.1
Silver (Ag)	mg/L	0.05	0.05	0.05	0.05
Sodium (Na)	mg/L	200	200	200	200
Sulphur (S)	mg/L	0.05	0.05	0.05	0.05
Zink (Zn)	mg/L	3	3	5	5

Table 3: The measurement parameter for national lake water quality criteria and standards according to categories

PARAMETER	UNIT	CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY D
PHYSICALS					
Colour	TCU	100 - 200	150 - 300	300	300.00
Conductivity	µS/cm	1000	1000	2000	5000.00
Salinity	ppt	nvd	nvd	<1	>1
Floatables	-	NV	NV	NV	NV
Dissolved oxygen	mg/L	6.3 - 7.8	5.5 - 8.7	4.5 - 10.3	3.3 - 10.3
DO percentage saturation	%	80 - 100	70 - 110	55 - 130	40 - 130
Odour	-	NOO	NOO	NOO	NOO
pH	-	6.5 - 8.5	6.5 - 8.5	s	5.5 - 9.0
Taste	-	NOT	NOT	NOT	NOT
Temperature	°C	28	28	28	28.00
Total Suspended Solid	mg/L	<100	100 - 500	200	> 200
Turbidity	NTU	40.0	40 - 170	70	250.00
Transparency (Secchi)	m	0.6	0.60	0.3	0.30
Oil & Grease	mg/L	1.5	1.50	1.5	1.50
NUTRIENTS					
Ammoniacal Nitrogen (NH_3-N)	mg/L	0.1	0.3	1	2.70
Nitrate-N (NO_3-N)	mg/L	7.0	7.0	10	10.0
Total Phosporus	mg/L	0.01	0.035	0.04	0.05
HEAVY METALS					
Arsenic (As)	mg/L	0.05	0.10	0.15	0.40
Cadmium (Cd)	mg/L	0.002	0.002	0.01	0.01
Lead (Pb)	mg/L	0.05	0.05	0.05	0.05
Mercury (Hg)	mg/L	<0.001	<0.001	<0.001	< 0.001
Nickle (Ni)	mg/L	0.02	0.02	0.05	0.05
Aluminium (Al)	mg/L	0.10	0.10	0.05	0.05
Antimony (Sb)	mg/L	0.03	0.03	0.03	0.03
Barium (Ba)	mg/L	0.10	0.10	1.00	1.00
Beryllium (Be)	mg/L	0.004	0.004	0.004	0.004

Boron (B)	mg/L	1.00	1.00	1.00	1.00
Chromium (Cr)	mg/L	0.05	0.05	0.05	0.05
Cobalt (Co)	mg/L	0.05	0.05	0.05	0.05
Copper (Cu)	mg/L	0.02	0.02	0.02	0.02
Iron/Ferum (Fe)	mg/L	1.00	1.00	1.00	1.00
Magnesium (Mg)	mg/L	150.00	150.00	150.00	150.00
Manganese (Mn)	mg/L	0.10	0.10	0.10	0.10
Silver (Ag)	mg/L	0.05	0.05	0.05	0.05
Sodium(Na)	mg/L	200.00	200.00	200.00	200.00
Sulphur (S)	mg/L	0.05	0.05	0.05	0.05
Zinc (Zn)	mg/L	3.00	3.00	5.00	5.00
BIOLOGICAL / MICROBIOLOGICAL					
Chlorophyll-a	µg/L	10	15	15	25
Biochemical Oxygen Demand (BOD)	mg/L	3	6	6	8

Table 4: Parameter used in national water quality standard for Malaysia (Environmental Quality Report,2020)

PARAMETER	**UNIT**	**CLASS**					
		I	**IIA**	**IIB**	**III**	**IV**	**V**
Ammoniacal Nitrogen	mg/L	0.1	0.3	0.3	0.9	2.7	> 2.7
Biochemical Oxygen Demand	mg/L	1	3	3	6	12	> 12
Chemical Oxygen Demand	mg/L	10	25	25	50	100	> 100
Dissolved Oxygen	mg/L	7	5 - 7	5 - 7	3 -5	< 3	< 1
pH	-	6.5 - 8.5	6 - 9	6 - 9	5 - 9	5 - 9	-
Colour	TCU	15	150	150	-	-	-
Electrical Conductivity	mS/cm	1000	1000	-	-	6000	-
Floatables	-	N	N	N	-	-	-
Odour	-	N	N	N	-	-	-
Salinity	%	0.5	1	-	-	2	-
Taste	-	N	N	N	-	-	-
Total Dissolved Solid	mg/L	500	1000	-	-	4000	-
Total Suspended Solid	mg/L	25	50	50	150	300	300
Total Suspended Solid	mg/L	25	50	50	150	300	300
Temperature	°C	-	Normal + 2 °C	-	Normal + 2 °C	-	-
Turbidity	NTU	5	50	50	-	-	-
Faecal Coliform	count/						
100 mL	10	100	400	5000			

Table 5: Additional parameter used in national water quality standard for Malaysia

PARAMETER	UNIT	CLASS				
		I	IIA/IIB	III	IV	V
Al	mg/L		-	-0.06	0.5	
As	mg/l		0.05	0.4 (0.05)	0.1	
Ba	mg/l		1	-	-	
Cd	mg/l		0.01	0.01* (0.001)	0.01	
Cr (IV)	mg/l		0.05	1.4 (0.05)	0.1	
Cr (III)	mg/l		-	2.5	-	
Cu	mg/l		0.02	-	-	
Hardness	mg/l		250	-	-	
Ca	mg/l		-	-	-	
Mg	mg/l		-	-	-	
Na	mg/l		-	-	3 SAR	
K	mg/l		-	-	-	
Fe	mg/l		1	1	1 (Leaf) 5 (Others)	
Pd	mg/l		0.05	0.02* (0.01)	5	
Mn	mg/l		0.1	0.1	0.2	
Hg	mg/l		0.001	0.004 (0.0001)	0.002	
Ni	mg/l		0.05	0.9*	0.2	
Se	mg/l		0.01	0.25 (0.04)	0.02	
Ag	mg/l		0.05	0.0002	-	
Sn	mg/l		-	0.004	-	
U	mg/l		-	-	-	
Sr-90	Bg/l		< 1	-	-	
CCE	µg/l		500	-	-	
MBAS/BAS	µg/l		500	5000 (200)	-	
O&G (Mineral)	µg/l		40 ; N	N	-	
O&G (Emulsified Edible)	µg/l		7000 ; N	N	-	
PCB	µg/l		0.1	6 (0.05)	-	
Phenol	µg/l		10	-	-	
Aldrin/Dieldrin	µg/l		0.02	0.2 (0.01)	-	
BHC	µg/l		2	9 (0.1)	-	
Chlordane	µg/l		0.08	2 (0.02)	-	
t-DDT	µg/l		0.1	-1	-	
Endoslufan	µg/l		10	-	-	
Heptachlor/Epoxide	µg/l		0.05	0.9 (0.06)	-	
Lindane	µg/l		2	3 (0.4)	-	
2,4-D	µg/l		70	450	-	
2,4,5-T	µg/l		10	160	-	
2,4,5-TP	µg/l		4	850	-	
Paraquat	µg/l		10	1800	-	
2,4,5-T	µg/l		10	160	-	
2,4,5-TP	µg/l		4	850	-	

Notes:
* = At hardness 50 mg/l $CaCO_3$
# = Maximum (unbracketed) and 24 – hour average (bracketed) concentrations
N = Free from visible film sheen, discolouration and deposits

solid (TSS), biochemical oxygen demand (BOD), chemicals oxygen demand (COD), total nitrogen (TN), total phosphorus (TP), Copper (Cu), Lead (Pb),Zinc (Zn), Oil and Grease (O & G) and Bacteria (E. coli). However, there are three pollutant generation potential that always take place in the urban area which were resulted from various landuse as presented in Table 6.

Additionally, accumulation of the pollutants was estimated based on the EMC method and it depends on the land activities and practices at the selected area. Table 7 is showing the example of estimated pollutants at four selected area which were in Malacca, Damansara, Penang and Kajang that was conducted by the authority.

5. Physico chemical for water assessment

To protect and restore water related ecosystem is in line with one of the United Nation Sustainable Development Goals,which is SDG 6, through the restoration and preservation of freshwater ecosystems (Wuijts, Driessen, & van Rijswick, 2018). Water Quality standard have been measured from numerous perspectives, and geology and other related factors influence the evaluation criteria such as type of soil (Wan Sulaiman,2019). Typically, a water source's physical, chemical, and biological compositions are used to determine its quality (Danjuma, 2019). Depending on the type of water body (lakes) and its various uses, a variety of physicochemical and biological characteristics are selected to evaluate the quality of lake water (or other surface sources)(Vasistha & Ganguly, 2020). Determining the existing properties of a water body will assist in identifying potential trends and aid in choosing the most effective methods for monitoring water pollution. Thus, Water Quality Index (WQI) is a crucial instrument for identifying the lake water quality.

The classification of water was identified based on the values of six main parameters, including dissolved oxygen (% saturation), biochemical oxygen demand, chemicals oxygen demand, ammoniacal nitrogen, total suspended solids, and pH, as shown in the equation in Figure 1. However, the surrounding environment affected the hydrological system, particularly soil as a water runoff medium. The 6 major parameters above have been briefly discussed.

5.1 Dissolved oxygen

Dissolved oxygen (DO) is is an essential indicator of water quality that can be easily measured in any body of water. According to Kannel & Lee (2007), dissolved oxygen is a key factor for aquatic life and plants as well as a barometer for measuring water health. Regarding the process of respiration from animals and plants in water bodies, the amount of dissolved oxygen can decrease, which will increase the photosynthetic activity of algae (Dominic, Murali, & Nisha, 2009). Without proper management and control, this mechanism affected the water quality.

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WQI = (0.22*SIDO) + (0.19*SIBOD) + (0.15* SIAN) + (0.16*SISS) + (0.12* SIpH)

where;
SIBOD = Subindex DO(% saturatior
SIBOD = Subindex BOD
SICOD = Subindex COD
SIAN = Subindex NH3-N
SISS = Subindex SS
SIpH= Subindex pH
0 ≤ WQI ≤ 100

WQI SCORE
Class I = > 92.7
Class II = 76.5 – 92.7
Class III = 51.9 – 76.5
Class IV = 51.9 -76.5

Figure 1: Water quality index formula and calculation. (Malaysia Environmental Quality Report, 2020)

5.2 Biochemicals oxygen demand

In addition, the trend of biochemical oxygen demand (BOD) was found to be comparable to the value of chemical oxygen demand (COD) in term of being significantly correlated with the water quality status (Hossain, Sujaul, & Nasly, 2013). The value of dissolved oxygen decreases as biochemical oxygen demand increases (BOD) (Jodeh, Salim, & Haddad, 2013). A significant contributor to the increase in biochemical oxygen demand is the high proportion of organic pollution load in water (Muyibi, Ambali, & Eissa, 2007).

5.3 Chemicals oxygen demand

As mentioned previously, the biochemical oxygen demand (BOD) correlates with the value of chemicals oxygen demand (COD), and it is toxic to biological life (David Noel, Rajan, & Sivakumar, 2014). According to Mohamed & Othman (2015), the correlation between COD value and temperature and ammoniacal nitrogen is also positive (NH3N).

5.4 Ammoniacal Nitrogen

Besides, the amount of ammonical nitrogen (NH3N) that influences eutrophication and the high concentration of ammonical nitrogen (NH3N) generally supply from industrial activities such as vicinity of polymer, chemical, metal, gas ,wooden industries, agro-based industries that received their effluents contribute to the water quality degradation that has become a primary environmental concern (Hossain, Sujaul, & Nasly, 2013).

5.5 Suspended solid

A suspended solid load can harm the receiving water bodies (Burford, Costanzo, Dennison, Jackson, & Jones, 2003). According to Mohamed & Othman (2015), suspended solid (SS) are composed of both organic and inorganic material wastes. Sources of suspended solid (SS) include surrounding activities such as earthwork or land clearing.

5.6 pH

On top of that, pH is a significant indicator that affects chemicals and biological processes, and most organisms' survival depends on a particular range of pH (Kannel & Lee, 2007). pH was found to be positively correlated with the amount of biological oxygen demand (BOD) and chemicals oxygen demand (COD) (Hossain et al., 2013). By definition, pH measures the hydrogen concentration in any substance, such as water or soil, and the value is typically associated with acidity or alkalinity (Rahmanian et al., 2015). According to Sujaul, Sobahan, Edriyana, Yahaya, & Yunus (2015), the atmosphere's temperature can impact the pH level.

5.7 Trace elements or heavy metals

Large quantities of pollutants are produced in urban environments, accumulating on surfaces such as roads and roofs. These contaminants enter the storm sewer system during rain events, where they are either transport to treatment facilities or discharged directly into receiving waterways. Numerous pollutants from stormwater such as heavy metals (lead, zinc, copper, cadmium, chromium and nickel), organic compounds, nutrients, solids, have accumulated in the bottom sediment, resulting in higher concentrations than in natural sediments (Karlsson, Viklander, Scholes, & Revitt, 2010). In particular, Soldatova et al. (2018) conducted a highly thorough health risk assessment study by considering the potential toxic effects of 11 drinking water contaminants, including lead, thallium, mercury, and the heavy metals, NO_3^-, NH_4^+, Fe, Mn, and As (Pb) (Li & Wu, 2019). According to Ashraf, Maah, & Yusoff (2011), high concentration of some of the heavy metals, such as Pb^{2+}, Zn^{2+}, Ni^{2+}, Co^{2+}, As^{3+}, Cu^{2+}, Fe^{2+}, Mn^{2+}, Sn^{2+} have direct effects on the growth of crops, while other heavy metals do not directly affect crop growth but may indirectly affect the animals that feed on the crops.

6. Conclusion

As a conclusion, lake water quality that affected by pollution from the activities surrounding will render the water unfit for human activities, particularly those involving bodily contact. This might be considered as risk management for the *Toyyiban* environment, as we should provide a safe and healthy space for halal lifestyle. All of the evaluated physicochemical properties can serve as a guideline for identifying or determining the risk to lake water quality and apart of *Toyyib* environmental assessment to provide a safe condition for human activities such as water recreation activities and also other ecosystem. The overview of few assessment from National Lake Water Quality Criteria and Standards, National Water Quality Standard for Malaysia and Urban Storm Water Management Manual for Malaysia had presented the indicator to ensure the quality of water for future lake water quality management for *Toyyib* environmental assessment.

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