AL-KAUNIYAH: Jurnal Biologi, 16(2), 2023, 412-422
Website: http://journal.uinjkt.ac.id/index.php/kauniyah
P-ISSN: 1978-3736, E-ISSN: 2502-6720

FISH COMMUNITY STRUCTURE THE DRY SEASON IN THE CIPELES RIVER, SUMEDANG REGENCY, WEST JAVA PROVINCE, INDONESIA

STRUKTUR KOMUNITAS IKAN PADA MUSIM KEMARAU DI SUNGAI CIPELES, KABUPATEN SUMEDANG, PROVINSI JAWA BARAT, INDONESIA

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Submitted: 24 January 2023; Revised: 7 May 2023; Accepted: 11 June 2023

Abstract

Cipeles River is a sub-watershed of the Cimanuk River that flows in Sumedang Regency, Indonesia. The upstream is located in Sukasari District and flows into Tomo District. This study aimed to determine the fish community structure in the Cipeles River during the dry season. This research was conducted from September to December 2020 using field observation methods and purposive sampling techniques at three stations (Station 1 at 6°48′59.5″S and 108°01′22.5″E; Station 2 at 6°48′56.2″S and 108°01′32.3″E; and Station 3 at 6°47′3.7″S and 108°05′44″E) data analysis employed descriptive-comparative. Parameters observed are abundance, diversity, dominance, uniformity, community structure, and water quality. The results showed that from 566 caught fish the diversity index is low with a value of 0.86–0.89, a moderate dominance index with a value of 0.55–0.62, and a low uniformity index of 0.16–0.17. Based on the three index values, it can be concluded that the fish community structure the dry season in the Cipeles River is categorized as depressed, caused by the high influence of total suspended solids that have exceeded the water quality threshold value for fisheries (according to regulation of the Government of the Republic of Indonesia Number 22 of 2021 on Spatial Management) with concentrations ranging from 67 mgL^{-1} to 74 mgL^{-1}.

***Keywords*:** Community structure; Depressed; Dominance; Total suspended solid

Abstrak

Sungai Cipeles merupakan sub DAS dari Sungai Cimanuk yang mengalir di Kabupaten Sumedang, Indonesia. Hulunya terletak di Kecamatan Sukasari dan mengalir ke Kecamatan Tomo, Kabupaten Sumedang. Penelitian ini bertujuan untuk mengetahui struktur komunitas ikan di Sungai Cipeles pada musim kemarau. Penelitian dilakukan pada bulan September hingga Desember 2020 dengan menggunakan metode pengamatan lapangan dan teknik purposive sampling pada tiga stasiun (Stasiun 1 di 6°48'59.5"LS dan 108°01'22.5"BT, Stasiun 2 di 6°48'56.2" S dan 108°01'32.3"BT, dan Stasiun 3 di 6°47'3.7"LS dan 108°05'44"E). Analisis data menggunakan deskriptif-komparatif. Parameter yang diamati adalah kelimpahan, keragaman, dominasi, keseragaman, struktur komunitas, dan kualitas air. Hasil penelitian menunjukkan bahwa dari 566 ikan yang ditangkap indeks keragamannya rendah dengan nilai 0,86–0,89, indeks dominansi sedang dengan nilai 0,55–0,62, dan indeks keseragaman rendah 0,16–0,17. Berdasarkan ketiga nilai indeks tersebut dapat disimpulkan bahwa struktur komunitas ikan pada musim kemarau di Sungai Cipeles dikategorikan tertekan, disebabkan oleh tingginya pengaruh total padatan tersuspensi yang telah melebihi nilai ambang batas kualitas air untuk perikanan (menurut Peraturan Pemerintah Republik Indonesia Nomor 22 Tahun 2021 tentang Penataan Ruang) dengan konsentrasi berkisar antara 67 mgL^{-1} sampai dengan 74 mgL^{-1}.

***Kata Kunci**: Dominansi; Struktur komunitas; Tertekan; Total suspended solid*

Permalink/DOI: http://dx.doi.org/10.15408/kauniyah.v16i2.30665

INTRODUCTION

Cipeles River is one of the sub-watersheds of Cimanuk River with an area of 303 km^2 and a length of about 61 km through 8 districts. The upstream of the river is in Sukasari District and passes through several districts: Pasanggarahan, Padasuka, Sumedang Municipality, Situraja, Darmaraja, Wado, Cadasngampar respectively, and empties into the Cimanuk River in Tomo District, Sumedang Regency (Yustiati et al., 2019). The Cipeles River is fed by 11 tributaries including the Ciherang, Ciseda, Cipicung, Cileuleuy, Cipongkor, Cisugan, Cihonje, Ciraden, Cikoneng, Ciderma, and Cicapar River (Hermawan, 2010).

The Cipeles River supporting the activities of the surrounding community is used as an irrigation channel to irrigate rice fields, plantations, toilets and washrooms, and traditional fishing ("Rumpon") activities, which is the local wisdom since the Sumedang Larang Kingdom era. Hermawan (2010) stated that the "Rumpon" (fish aggregating device) tradition is an activity carried out in the dry season by covering the surface of the several streams ("Leuwi") using bamboo and wood branches that resemble Fish Aggregating Device (FADs), after 3–4 months to be precise on August 17 (concurrent with Indonesia's independence day), the community opened FADs together to catch fish using "Kecrik" (traditional cast net), fishing rods and electrical stunning.

The construction of the Rengrang Dam which holds the water flow of the Cipeles River covers an area of ±2,216 ha, geographically it is located at 6°48'58,87" S and 108° 01'27,27" E. Administratively, it is located in Parugpug Kaler Village, Cijambe Village, Paseh District. The Rengrang Dam irrigation system is planned to irrigate an area of ±1,500 ha of rice fields in 3 districts covering 1136.72 ha of Paseh District, 888.04 ha of Conggeang District, and 191.40 ha of Tomo District. A dam that is not equipped with a fishway will harm the fish community structure in the Cipeles River, especially when the dam water is reduced (dry season). The construction of the dam that does not take into account changes in the fish migration route and the loss of fish habitat causes the decline and loss of native fish species from the river (Kartamihardja et al., 2009).

Sjafei et al. (2001) stated there are 21 species belonging to 6 families that are caught in the middle of the Cimanuk River. Types of fish that are rarely found and as consumption fish are river carp (*Tor douronensis* Valenciennes, 1842). Ecological problems arise in the research of Sjafei et al. (2001) which found that the water quality condition of the Cipeles River was not in good condition with the abundance of moss and worms found on the river bank rocks which indicated that the waters of the Cipeles River were polluted. Furthermore, Hermawan (2010) reported that in the last ten years, the Cipeles River has decreased in water discharge, that it has an impact on the types of fish that live in the Cipeles river. Yustiati et al. (2019) who conducted research before and after the construction of the Rengrang Dam during the rainy season found that only 13 species of fish caught in the Cipeles River: Barb (*Barbonymus balleroides* Valenciennes, 1842), Beardless barb (*Diplocheilichthys pleurotaenia* Bleeker, 1855), Silver barb (*Barbonymus gonionotus* Bleeker, 1849), Hampala barb (*Hampala macrolepidota* Kuhl and Van Hasselt, 1823), Javaen barb (*Barbodes orphoides* Valenciennes, 1842), Common barb (*Mystacoleucus marginatus* Valenciennes, 1842), Silver rasbora (*Rasbora argyrotaenia* Bleeker, 1854), Gangetic mystus (*Mystus cavasius* Hamilton, 1822), Long whiskers catfish (*Mystus gulio* Hamilton, 1822), Two-spot catfish (*Mystus nigriceps* Valenciennes, 1846), Butter catfish (*Ompok bimaculatus* Bloch, 1794), Striped snakehead (*Channa striata* Bloch, 1793), and Stream loach (*Nemacheilus chrysolaimos* Valenciennes, 1846).

This research aimed to map the fish community structure in the Cipeles River, Sumedang Regency, Indonesia during the dry season. The research results expected to provide information which can be used as basic information for resource management considerations and fisheries conservation in the Cipeles River.

MATERIALS AND METHODS

The research was carried out from September to December 2020 in the waters of the Cipeles River, Sumedang Regency, West Java Province. The fishing gear used is a "Kecrik"/cast net with

mesh sizes of 0.59, 2, 3 inch, and a scoopnet. The research was conducted at three stations (Table 1) with four sampling times.

Table 1. Cipeles River research site

Stations	Located	Coordinate	Land used on the river banks
1	Cipeles River in Citepok Village, Tomo District, Sumedang Regency	6°48′59.5″S, 108°01′22.5″E	Plantations, rice fields, and fishing
2	Cipeles River in Cijambe Village, Paseh District, Sumedang Regency	6°48′56.2″S, 108°01′32.3″E	Rice fields, starch factories, and fishing
3	Cipeles River in Karyamukti Village, Tomo District, Sumedang Regency	6°47′3.7″S, 108°05′44″E	Settlements, plantations, and fishing

Research Method

The sampling method used in this research is survey, the sampling technique is purposive sampling. According to Sugiyono (2013) purposive sampling is a technique to select data sources with certain considerations. The identification of caught fish species includes descriptive morphometric and meristic measurements with the help of the identification manual according to Kotellat et al. (1993), Herawati et al. (2019), and the fishbase page was conducted at the Laboratory of Aquatic Resources Management, Faculty of Fisheries and Marine Science, Universitas Padjadjaran. Water quality measurement is carried out in two methods, the first method is in-situ for temperature, DO, pH, and depth carried out at the research station and the second method is ex-situ for ammonia and nitrite analyzed at the Laboratory of Aquatic Resources Management, Faculty of Fisheries and Marine Science, Universitas Padjadjaran, while for COD, TSS, TDS analyzed in the Laboratory Research and Development Center for Water Resources Research and Development Center for Water Resources (*Pusat Penelitian dan Pengembangan Sumber Daya Air*-PUSAIR, Bandung, Indonesia).

The method of determining the fish protection status uses the Redlist International Union for Conservation of Nature (IUCN) page with the categories Data Deficient (DD), Least Concern (LC), and Near Threatened (NT). Data Deficient is a conservation status given to a species in which data information regarding distribution and population status is insufficient to estimate the risk of extinction. Least Concern is a conservation status given to a species that has been evaluated but is not admitted in the endangered category, nor is it dependent on conservation. Near Threatened is an IUCN category given to species that are in a threatened or near extinction condition, even though they are not included in the threatened status (Herawati et al., 2019).

The method used in determining the structure of the fish community, the data were analyzed descriptively quantitatively on the relative abundance, diversity index, uniformity, and dominance of each station (Stations 1, 2, and 3), and the data are presented in the form of polygons on a map using Microsoft excel software and ArcMap GIS 10.3.

The relative abundance value determination of the population refers to Michael (1994) using the following formula RA = $\frac{ni}{N}$ x 100%. Information, RA= relative abundance; ni= number of individuals of each species; N= number of individuals of all kinds

Fish diversity is calculated using the Shannon-Weinner Diversity Index according to Odum (1993), H'= Σ pi In p*i*. Information: H'= Shannon-Wienner diversity index; pi= the ratio of the individual number of the 1st fish species to the total number of individuals (ni/N); i= 1,2,3….n. The rating categories for the H' Shannon-Weinner Index are as follows H'<1= low diversity; 1<H'<= medium diversity; H'>3= high diversity.

According to Odum (1993) Simpson's dominance index can be calculated using the formula, C= Σ pi^2. Information, C= dominance index; pi= proportion of number of individuals in fish species; i= 1, 2,3…n. The index value rangers from 0 to 1 with the following categories 0<C<0.5= low dominance; 0.5<C<0.75= moderate dominance; and 0.75<C<1.0= high dominance.

The uniformity index describes the ecosystem balance. The Shannon-Weinner uniformity index formula according to Magurran (1987), E= H'/H max. Information, E= uniformity index; H'= diversity index; H' max= maximum diversity index= In S; S= total number of species. The uniformity index value ranges from 0 to 1 with the following categories, 0<E<0.4= small uniformity, depressed community structure; 0.4<E<0.6= moderate uniformity, unstable community structure; 0.6<E<1.0= high uniformity, stable community structure.

RESULTS

Fish Species Composition

The number and types of the caught fish during the research are different for each station, over all the caught fish was an accumulative amount. Fish caught were 566 from eight species, seven genera, four families, namely the *Cyprinidae* family, four species (50%) consisting of Barb (*Barbonymus balleroides*), Common barb (*Mystacoleucus marginatus*), Hampala barb (*Hampala macrolepidota*), and Silver rasbora (*Rasbora aprotaenia*).

Table 2. Types of fish caught in the Cipeles River

Family (4)	Local name (8)	Common Name	Scientific name	Based on origin		Station		
				Native	Introduction	1	2	3
Bagridae (25%)	Baung	Gangetic mystus	*Mystus cavasius* Hamilton 1822	√		4	6	2
	Singaringan	-	*Mystus singaringan* Bleeker, 1846	√				6
Cichlidae (12,5%)	Nila	Nile tilapia	*Oreochromis niloticus* Linnaeus, 1758		√	8	2	4
Cyprinidae (50%)	Genggehek	Common barb	*Mystacoleucus marginatus* Valenciennes, 1842	√		144	26	154
	Lalawak, Balar, Brek	Barb	*Barbonymus balleroides* Valenciennes, in Cuvier and Valenciennes, 1842	√		42	120	18
	Hampala	Hampala barb	*Hampala macrolepidota* Kuhl and van Hasselt, 1823	√		4		
	Paray	Silver rasbora	*Rasbora aprotaenia* Hubbs and Brittan, in Brittan, 1954	√			12	12
Zenarchopteridae (12,5%)	Julung-julung	Wrestling halfbeak	*Dermogenys pusilla* Kuhl Kuhl and van Hasselt, in van Hasselt, 1823	√				2
Percentage (%)				87.5%	12.5%	202	166	198

Two species of family *Bagridae* (25%) namely Singaringan (*Mystus singaringan* Bleeker, 1846) and Gangetic mystus (*Mystus cavasius*). One species of family *Cichlidae* (12.5%) is Nile tilapia (*Oreochromis niloticus* Linnaeus, 1758). One species of family *Zenarchopteridae* (12.5%) is Wrestling halfbeak (*Dermogenys pusilla* Kuhl Kuhl and van Hasselt, in van Hasselt, 1823) (Table 2).

Relative Abundance

There are 202 fish caught at Station 1 during the research, consisting of five species from three families: Barb, Common barb, Hampala barb, Gangetic mystus, and Nile tilapia. The highest relative abundance at Station 1 is Common barb 71.3%, the second relative abundance is Barb 20.8% followed by Nile tilapia 3.96% and the lowest relative abundance are Hampala barb, and Gangetic mystus 1.98% (Figure 1). Caught fish at Station 2 is 166 fish consisting of five species in three families, notably Silver rasbora, Gangetic mystus, Barb, Common barb, and Nile tilapia. The highest relative abundance is Barb 72.29% and the lowest relative abundance is Nile tilapia 1.2%. Meanwhile, other relative abundances values are Common barb 15.7%, Silver rasbora 7.23%, and Gangetic mystus 3.61%. The number of caught fish at Station 3 was 198 fish, attributed to seven species in four families, i.e. Common barb, Silver rasbora, Nile tilapia, Wrestling halfbeak, Gangetic mystus, Singaringan, and Barb. The highest relative abundance is Common barb 77.8%, with the lowest relative abundance are Gangetic mystus and Wrestling halfbeak 1.01%.

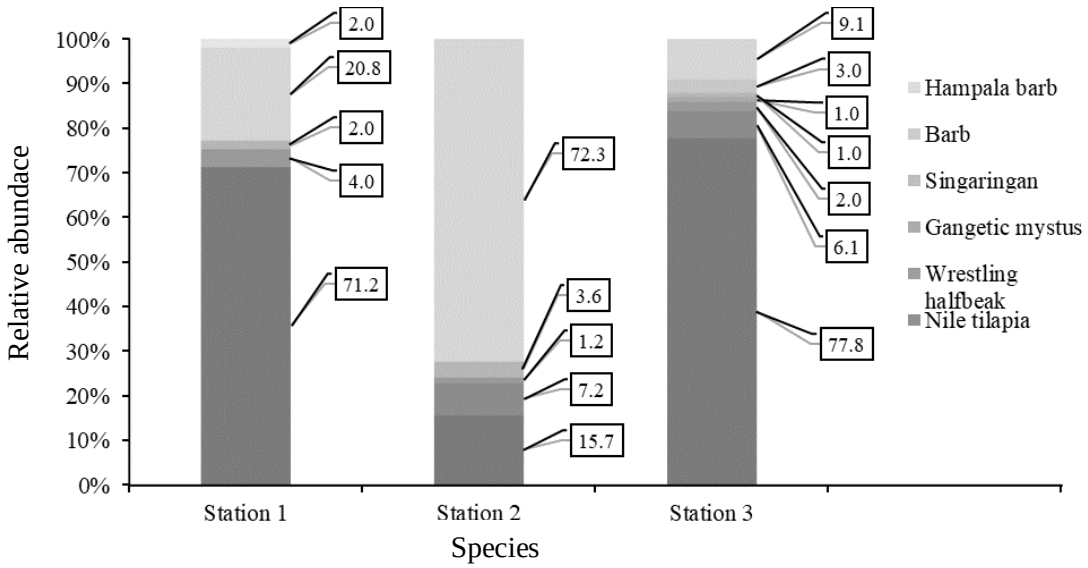

Figure 1. The relative abundance in the Cipeles River

Diversity Index

Based on the Figure 2, H' value in the Cipeles River during research ranging between 0.85 to 0.89, which means diversity index is low (refers to Shannon-Weiner Index) and indicates that fish diversity in the Cipeles River is in poor condition. There are five species of fish that caught at Station 1 and 2, and seven species at Station 3. According Odum (1993) criteria that stated if the value of H' <1 is said that species diversity is considered low, influenced by the distribution of individuals in a community, each species has an uneven distribution.

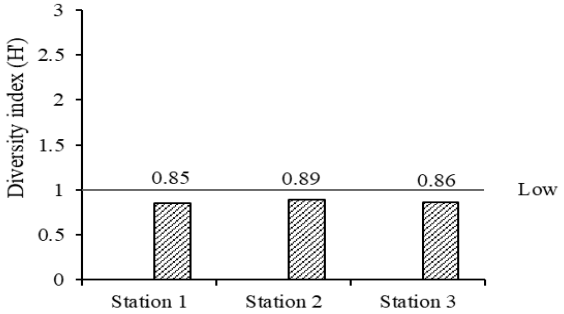

Figure 2. Diversity index in Cipeles River

Dominance Index

Fish dominance is a type of fish that dominates in every habitat in a community. The dominance of fish at the research station can be seen in Figure 3. The dominance index value from three research stations ranged from 0.55 to 0.62, which means that the dominance index in the Cipeles River is moderate or there are abundant species. This result is in accordance with Odum (1993) criteria that stated if the value of 0.5<C<0.75 is said to be moderate. Based on the results, the composition of species that dominates at Station 2 is differs from Stations 1 and 3. At Station 1 from the five fish species caught, the most caught fish is Common barb as many as 144 individuals (71.2%), and similar condition appear at Station 3 the dominant caught fish is Common barb (154 fish/77.8%). Meanwhile, Station 2 from the five fish species caught, the most caught fish is Barb as many as 120 individuals (72.3%).

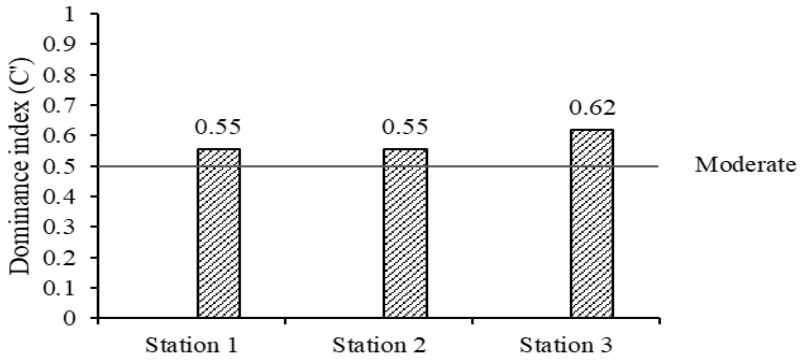

Figure 3. Dominance index in the Cipeles River

Uniformity Index

The uniformity index is an ecological index based on biological factors to determine the condition of an ecosystem. The fish uniformity index value in the Cipeles River ranges from 0.16–0.17 (Figure 4).

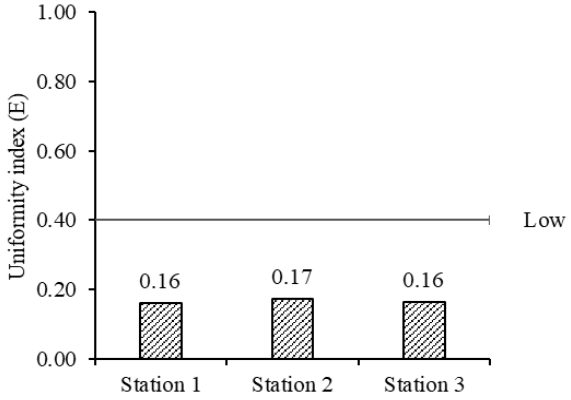

Figure 4. Uniformity index in the Cipeles River

Water Quality

The results of the analysis of water quality characteristics related to Government Regulation Number 22 of 2021 are based on class II water quality standards which are designated for freshwater aquaculture activities on 9 water quality parameters of the Cipeles River (Table 3).

Table 3. Water quality in Cipeles River

Parameter	Method*	Station			Standard GR No. 22 of 2021
		1	2	3	
Physics					
Temperature (°C)	Potentiometric	29	29	25	Deviation 3
Depth (m)	Potentiometric	2–4	2–3	1–2	-
TDS (mg l^{-1})	APHA-AWWA-WEF 2540-C-2017	250	255	324	1000

Parameter	Method*	Station 1	Station 2	Station 3	Standard GR No. 22 of 2021
TSS (mg l^{-1})	APHA-AWWA-WEF 2540-D-2017	74	67	38	50
Chemical					
pH	Potentiometric	6	7.3	7	6–9
DO	Potentiometric	7.7	6.61	7.03	4
Total Ammonia (NH_3-N) (mg l^{-1})		0.001	0.002	0.002	0.2
Nitrit (mg l^{-1})		0.031	0.030	0.028	0.06
COD (mg l^{-1})	SNI 6989.2:2019	11	16	16	25

Imformation: *) *American Public Health Association* (APHA), *the American Water Works Association* (AWWA), and *the Water Environment Federation* (WEF) 2017, Indonesian National Standard (SNI)

DISCUSSION

The number of caught fish species is dominated by the *Cyprinidae* family at each station. Common barb (*M. marginatus*) had the highest relative abundance at Station 1, presumably because it prefers their habitat: dense vegetation along the riverbank as a shelter and foraging for food. This is in accordance with Fajri et al. (2009) and Herawati et al. (2020b) which states that good vegetation cover on riverbanks is a source of nutrient input and feed for biota that determines water productivity. The highest relative abundance at Station 2 is Barb (*B. balleroides*) because they can adapt to various habitats and have a wide distribution. Andani et al. (2017) stated that Barb are fish that have high adaptability from lotic ecosystem to a lentic ecosystem and their distribution is wide. The relative abundance of Common barb is the highest at Station 3 since the habitat is suitable for their growth and reproduction by utilizing natural food in the waters which are characterized by low currents and dense vegetation. The low currents and the presence of vegetation is a suitable habitat for Common barb, because those conditions can supply food and it is easier to lay eggs during mating seasons for *Cyprinidae* (Mahrudin et al., 2021). This is in line with Yuanda et al. (2012) and Herawati et al. (2020b) which stated that fish belong to the *Cyprinidae* family can adapt low currents and have high fecundity by utilizing natural conditions to breed.

This is presumably because species from the *Cyprinidae* family are native to the Cipeles River with suitable habitats for growing, and breeding by utilizing natural food resources in the waters. In line with the research of Yustiati et al. (2019) which found that the most caught fish in the Cipeles River during the rainy season belong to *Cyprinidae* family. The *Cyprinidae* family is a fish that dominates the Oriental Sunda Shelf (Sumatra, Java, and Borneo) with a total of 1,058 species (Sukmono et al., 2013). Meanwhile, the *Bagridae*, *Cichlidae*, and *Zenarchopteridae* families are lower than the *Cyprinidae* family. Kotellat et al. (1993) stated that *Cyprinidae* are freshwater fish that inhabit several rivers on the Borneo Island and Sumatra Island with the most important families apart from the *Bagridae* and *Pangasidae* families.

Based on the fish origin found in the Cipeles River, 87.5% are native to Indonesia (Common barb, Barb, Silver rasbora, Hampala barb, Singaringan, and Gangetic mystus), while 12.5% are introduced fish. Introduced caught fish are invasive, particularly *O. niloticus*. Herawati et al. (2019) stated that introduced and invasive fish are *Trichopodus trichopterus*, *Hyposarcus pardalis*, *O. niloticus*, and *O. mossambicus*. Meanwhile, based on the International Conservation Institute (IUCN) the fish found in the Cipeles River are categorized into two categories, first one is Data Deficient (DD) (12.5%) particularly *D. pusilla* and the second category is Least Concern (LC) (87.5%), notably *M. cavasius, M. marginatus, M. singaringan, B. balleroides, R. aprotaenia, H. macrolepidota*, and *O. niloticus.* The Least Concern category for Nile tilapia based on the International Union for Conservation of Nature (IUCN) is intended for those that lives in open waters, not cultured one. This is due to Nile tilapia is widely cultured in Indonesia as consumption fish. Hubert et al. (2015) stated that *O. niloticus* and *O. mossambicus* are species that have a high

economic value in Indonesia. Nile tilapia is fish commodities that are widely consumed and the majority of these species production are cultured by the fish farmers (Wibowo et al., 2021).

Based on the information from local fishermen that the population of indigenous fish caught in the Cipeles River has decreased due to natural factors and land use activities around the river such as the disposal of household waste, agriculture, plantations, and fishing as well as changes in river flow becoming inundated with the existence of Rengrang Weir. This is in accordance with Wahyuni and Zakaria (2018) which stated that fish population declines are caused by changes in river characteristics. Changes in land functions turning into sand mining, river flows that are flowing into stagnant waters (reservoirs), and changing habitat functions can affect the decline of indigenous fish added with high fishing activities (Herawati et al., 2020a). The existence of the Rengrang Weir can affect the direction of the flow and fish must be able to adapt to changes in habitat from flowing into inundated. Fish species that can adapt will grow, reproduce, and dominate the reservoir environment, while fish species that cannot adapt in the long term will decline or disappear and even become extinct (Andani et al., 2017).

According to caught fish data, we can presume that wrestling halfbeak (*D. pusilla*) are diminished from Cipeles River, even though Red List IUCN categorized them as Data Deficient (DD). Different results of classification using Red List IUCN shown by Herawati et al. (2020b) who studied Cipanas River before inundation found that both *B. balleroides* and *R. aprotemia* are categorized as Not Evaluated (NE), while in our research both of the fish are categorized as Least Concern (LC). Red List IUCN categorization similarities are found in Herawati et al. (2017), that conducted research at Jatigede Weir during early period of inundation, they classified *H. macrolepidota* as Least Concern (LC). Herawati et al. (2020a) study on downstream Cimanuk River during the rainy season also categorized *M. singaringan* as Least Concern (LC).

Compared to other research at Cipeles River, Susilawati (2001) and Sjafei et al. (2001), fish that are not found in our study notably Three spot gourami, Climbing perch, Kehkel, Twospot catfish, Whiskers catfish, Catfish, Goldfish, Yellow rasbora, Java barb, Silver barb, Spotted barb, Asian swamp ell, Beardless barb, Yellow catfish, Redtail catfish, and River carp. While compared to Hermawan (2010), our study did not found Beardless barb, Redtail catfish, and Catfish. Furthermore, according to Yustiati et al. (2019) who conducted research in rainy season, the differences are Beardless barb, Silver barb, Java barb, Yellow catfish, Twospot catfish, and Stream loach. These differences in the last two decades are caused by Rengrang Weir construction, different time, and different season. Wang et al. (2010) stated that fish diversity on a river becomes depressed due to changes from lotic into lentic ecosystem caused by dam contruction, so accordingly selection will occur. Jenkins et al. (2010) said that season also correlated with water temperature changes which result in alterations in habitat conditions and availability, thereby affecting fish diversity.

Identical results are found in Hermawan (2010), which stated that fish diversity in Cipeles River is low. Meanwhile, Yustiati et al. (2019) said that fish diversity is low to moderate. Fish diversity in upstream is lower than downstream of Rengrang Weir, this disparity occurred because there is no fishway in Rengrang Weir, Herawati et al. (2020c) added beside the absence of fishways, fish diversity also affected by fishing activities. Haryono (2017) said that fish diversity is higher on downstream along with the increasing of river width.

Dominance index values in Yustiati et al. (2019) shows similarity with our results, which is low (0.30–0.76). While Herawati et al. (2020a) conducted research at Cimanuk River upstream found that dominance index is low to high (0.19–0.78). Dominance index is considered low (there is no a fish species dominance other) if the value close to zero (0) and vice versa if the value towards one (1) (Ardani & Organsastra, 2009).

Uniformity index (E) in this study is similar to Yustiati et al. (2019), which E values in Station I, II, and III are 0.40, 0.23, and 0.10, respectively. Station I and II are located before Rengrang Weir, while Station III after Rengrang Weir. The diffence with our research is they conducting research shortly before Rengrang Weir construction. According to Shannon-Weinner index, the value of $0 \leq E \leq 0.4$ is categorized as low. The value of small population uniformity was

related to the condition of the Cipeles river with the diversity of species caught, namely eight species. Changes in the value of the diversity index value are influenced by pressure from continuous fishing activities and are associated with disruption of community structures such as reduced species richness, and shifts in fish species dominance (Suprapto, 2014).

According to Magurran (1987) criteria that E<0.4, the uniformity is low and the community structure is depressed so this value describes the distribution between species is unbalanced. Krebs (1972) stated that if the uniformity index value (E) is smaller than 0.4, the population does not spread, the the population uniformity value is low, and the distribution of individuals dominates. Low population uniformity is caused by the presence of more individuals than other individuals with species diversity that dominates from the three stations are the *Cyprinidae* family. The low population uniformity is influenced by the total suspended solid in the Cipeles River that exceed the threshold value of 50 mgL^{-1} (based on Government Regulation No. 22 of 2021 about Class II for aquaculture activities).

The results showed that water quality parameters consisting of temperature, depth, total dissolve solid, pH, dissolve oxygen, ammonia, nitrite, and chemical oxygen demand are still not exceeded the threshold based on Regulation of The Government of The Republic Indonesia Number 22 of 2021 for freshwater aquaculture. Total suspended solid at Station 1 (67 mg l^{-1}) and 2 (74 mg l^{-1}) are higher than Station 3 (38 mg l^{-1}), this result appeared since both of stations are located in residential and agricultural areas, thus it can become sediment traps that increase the total suspended solid value. This result is in agreement with Yulius et al. (2018) statement, total suspended value influenced by soil erosion consisting of mud and microorganisms that carried to the river.

CONCLUSION AND SUGGESTIONS

Fish community structure during the dry season in the Cipeles River at Stations 1, 2 and 3 is depressed namely low uniformity index (0.16–0.17), with low diversity (0.85–0.89), and the population distribution is uneven, there are abundant species with moderate dominance values (0.55–0.62). There were 566 types of fish caught and identified tails from 4 families, namely the *Cyprinidae*, *Bagridae*, *Cichlidae*, and *Zenarchopteridae*. A suggestion for further research is to exercise the fish community structure in other rivers.

ACKNOWLEDGEMENTS

Thank you to the Faculty of Fisheries and Marine Sciences, Padjadjaran University for the support and access to the laboratories for this research.

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