PHYSICAL AND CHEMICAL CHRACTERISTIC OF LAKE PANJALU, GEDE, BAGENDIT AND CANGKUANG.

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INTRODUCTION

A great number of lakes are found in Indonesia which are comprise of important aquatic resources for he development of the country. Some of the significant fuctions of the lake among others for domestic use, fishery, irrigaion, industry, recreation and flood control. Not less important are their roles in recharging the undergroun water supply and as habitat for rich variaty of aquatic live. The lake ecosystem is not a totally closed system, its condition is determined by the physical, chemical, geological and biological feature inside the lake, but they them selves are very much influenced by input of matter and energy from the surrounding landscape.

Generally speaking the development of studies in Indonesian natural lake has been very slow, partly due to the lack of experts or scientists in related field. On the others hand information on the physics of lake of lake water in Indonesia or others tropical region is still lacking. Mean whille we are already faced with a lot of problems such a water pollution and eutrophication which deteriorate the aquatic environment and hence decreasing their utilization value. More serious is the drying of lakes, either by natural or due to human activities such as reclamation for agriculture and housing. The study on lake water is very important for the development of appropriate technology for lake eutrophication control. The new concep approach to control eutrophication is the loading concept approach (Vollenweider and Kerekes,1980).

The significant chemical physical factor for measuring and monitoring eutrophication among others are mineral nitrogen, orthophosphate and related descriptive parameters such as conductivity, temperature, pH and dissolved oxygen. The objective of the study is to reveal some physical and chemical characteristics of three lake is southern part of West Java.

MATERIAL AND METHODE

The study was conducted in lake (Situ) Panjalu, Gede, Bagendit and Cangkuang small tropical lakes. Field samplings were conducted two times i.e, the first sampling was done on 2th of June, 1992, and then last sampling on 10th of November, 1992. These lake have an average depth 1 - 2 m, maximum depth 3m for all lakes.

The pH and conductivity of water samples was measured with pH meter and conductivy meter, temperature and dissloved oxygen measured with portable digital DO/O_2/Temp meter model UK - 2000. At every sampling time, the measurement and the water taken started from the surface down to the secchi depth and then to bottom layer above the water-sediment interface.

Tabie 1. Average pH, DO, Conductivity and Temperature in the water column of Lake Panjalu (LP),Gede (LG),Bagendit (LB) and Cangkuang (LC).

Sampling, June, 1992

	Lake Panjalu	Lake Gede	Lake Bagendit	Lake Cangkuang
DO (ppm)	7.70±1.80	5.68±1.32	5.76±1.34	5.97±3.25
pH	6.40± 0.11	5.87±0.37	6.53±0.29	6.73±0.33
Temp(°C)	26.50±0.45	26.23±1.20	25.06±1.09	27.00±2.35
Cond. ($\mu s/cm^2$)	47.83±2.11	547.77±110.33	518.75±123.53	301.66±41.79

Tabie 2. Average pH, DO, Conductivity and Temperature in water column of lake Panjalu, Gede, Bagendit and Cangkuang

Sampling, November, 1992

	Lake Panjalu	Lake Gede	Lake Bagendit	Lake Cangkuang
DO(ppm)	7.69±0.55	5.75±1.32	7.72±0.72	7.88±0.96
pH	9.36±0.46	7.92±0.37	8.98±0.37	9.15±0.62
Temp(°C)	27.43±1.13	27.07±0.85	27.50±0.55	30.77±1.20
Cond($\mu S/cm^2$).	45.45±2.95	591.23±42.08	698.71±76.88	427.71±39.04

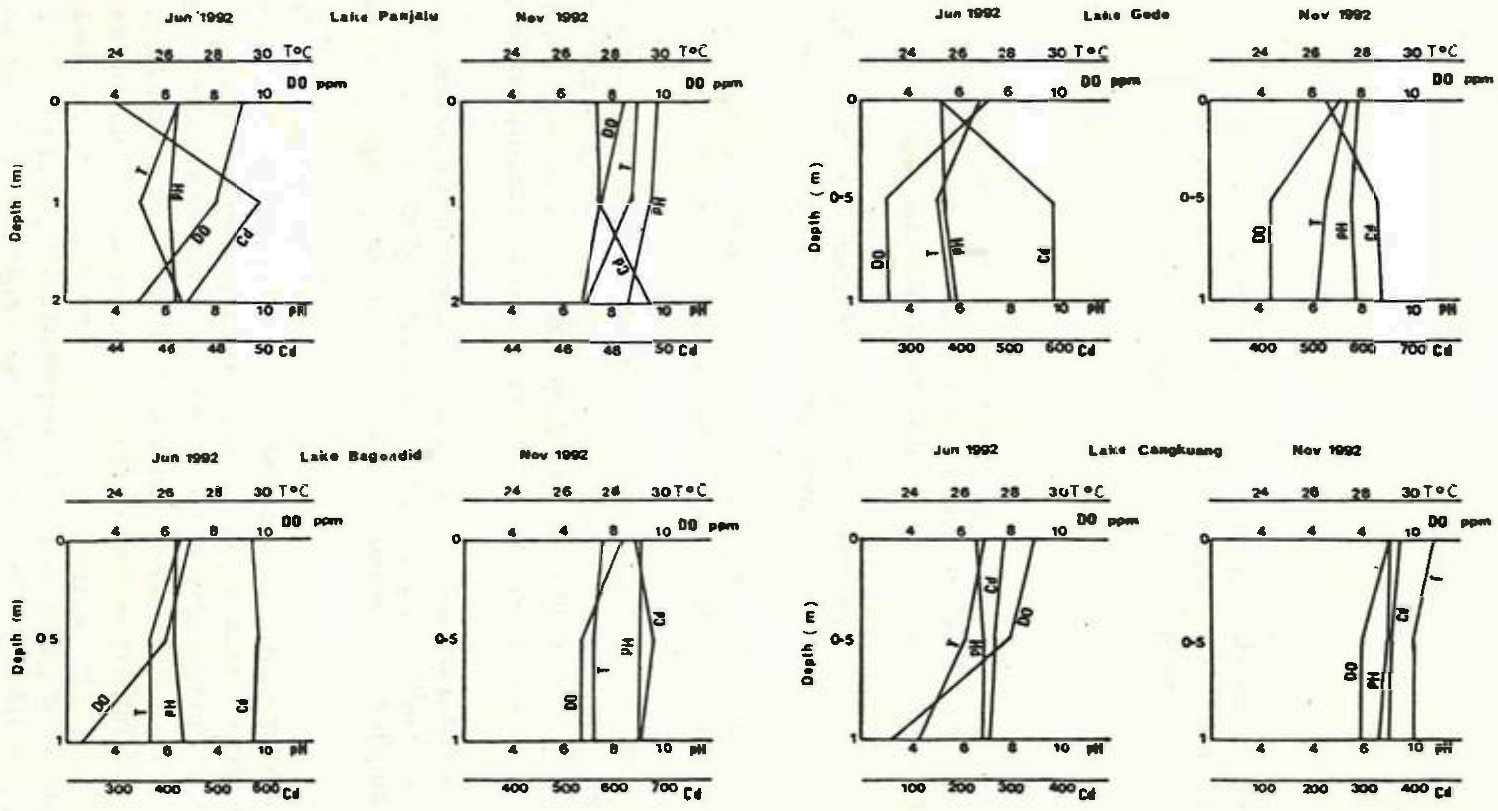

Figure 1. pH, DO, Conductivity and Temperature in The Water Column

RESULTS AND DISCUSSION

Data on table 1 shows that dissolved oxygen (DO) in the water column the firts samlping (June, 1992) with the second sampling (November, 1992) relative similar for Lake Panjalu (LP) and Lake Gede (LG) is 7.70 ± 1.80 mg/L to 7.69 ± 0.55mg/L and 5.68 ± 2.16 mg/L to 5.75 ± 1.32 mg\L and then for on Lake Bagendit (LB) with Lake Cangkuang (LC) on the November shows DO higher than on the June is 7.88 ± 0.96 mg/L to 5.97 ± 3.25 mg/L. This pattern indicate may be of several others processes such as existing process of ground water discharge at rainy season and recharge in the dry season, or to lower of DO on June (first sampling), the influence of aquatic plants whice cover a wide area of the lake, or maybe due to any the organic compounds deposit in down lake. The possibility to explain as higher conductivy on November (second sampling) for Lake Bagendit and Lake Cangkuang is 698.71 ± 76.88 $\mu s/cm^2$ and 427.71 ± 39.04 $\mu s/cm^2$.

Temperature in the all lake for first sampling and second sampling is relatively similar 25.06 °C to 30.77 °C. The temperature profile from the first sampling is unclearly indicates a stratification., However any thermocline form shows in temporer thermocline Fig. 1 .

Goldman and Horne (1983) informed for depth lake 1 to 3 m, thermocline seemed is temporary but for lakes which are very deep such as example Lake Tahoe (313 m) the thermocline is permanent. Ruttner (1928) informed the first thickness of thermocline define of depth 2 - 5 m in the shallow lakes or depth maximum 40 m in Indonesia.

The temperature profile in June and November, 1992 similars shows straight line from surface to bottom, this patter may be due to the possibility of over turn.

Table 2 shows the stability in the water lake fery small (0.05 - 1.40) kg m m^{-2} which shows low energy is necessary, energy for mixing of lake water.

Ruttner (1928) informed up to the depth 1 - 5 m in the tropical lake, is very easy of mixing because very small stability level, for example lake Ranau Lamongan in the East Java and Hartoto (1989) reported for lake Bojongsari (0.75 - 4.50) kg m m^{-2}.

CONCLUSION

From the results of the study of the four lakes conclusion can be with draw, is the distribution of dissolved oxygen shows lowest level in the, dry season (June, 1992). This information is important will be used as base for future development of management practices of these lakes.

DAFTAR PUSTAKA

Goldman, C.R. and A.J. Horne, 1983, *Limnology* Mc, Graw Hill International Book Company, Auckland, 464 p.

Hartoto, D.I. 1989. Profil Oksigen dan Suhu Danau Trofika Situ Bojongsari, Bogor. 159h.

Soerjani M, 1978, Pengelolaan danau di Indonesia, Biotrop, Seameo Regional Centre for Tropical Biology, Bogor, Biotrop/TP/78/314.

Vollenweider R. A. and J. Kerekes, 1980, The loading concept as basis for controlling eutrophication phylosophy and preliminary results of the OEDC programme o Eutrophication, In S. H. Jenkin (ed.) : Eutrophication of Deep Lakes. *Progress in Water Technology*, 12 : 5 - 38.