The Effect of Eutrophication on Drinking Water

R. K. Mishra[1]* and A.K.Tripathi[2]

[1]Department of physics, Govt H.S.S Kandel, India
[2]Department of physics, S.G.S. Govt. P.G. College

Abstract

[illegible] det2 high levels of phytoplankton, zooplankton, and algae biomass in stratiýed water bodies. This can lead algal blooms. The direct consequences is in an excess of oxygen consumption near bottom of the water body .eutrophication processes can be divided in to two categories depending on weather they are linked to the nutrients dispersion and phytoplankton growth to oxygen cycle near the bottom of the water body. Various e ects can be observed depending upon the severity of the eutrophication treatment of eutrophic water for producing drinking water. Algae disturbs the aquatic ecosystems a threat for animal and human health. Eutrophication concerns the availability of oxygenis. Some species of algae may also contain toxins but incidents where fresh water algae or the origin of cause human or animal illness. Some cyanobacteria have capacity to produces toxins dangerous to human beings. A variety of symptoms depending on toxins implicated our observed such as fatigues, headache, diarrhea, vomiting, and some throat fever skin irritations. Good practices to inform people about risks of bathing or sporting activity in normally colored or turbid waters allergic bathers of people walking along shore of water body a ected by algae blooms any allergies releasing not only toxin but also allergic compounds.

In some speciýc case; local authorities must rely on eutrophic water for producing drinking water.

: E . ophic a.e ; Ph .oplank.on; Algae; D inking a.e

"E . ophica.ion" i .he en ichmen. of face a.e i.h plan. n . ien. . While e . ophica.ion occ na. all , i. i no mall

1.

bioma , in ake [4]. Acco ding o an e ima e 400 g am of pho pha e co ld po en iall ind ce an algal bloom o he e en of 350 on (Sha ma 1999).E ophica ion i he p oce e of ce i e n ien en ichmen of a e ha picall e l in p oblem a ocia ed i h mac oph e, algal o c anobac e ial g o h. e ca e and ec of e ophica ion i comple . e c en a e of kno ledge, m ch e ea ch o k i p og e ha aim a f he ing o kno ledge of he in ica e in e ela ion hip in ol ed in e ophica ion of a e e o ce [5]. E ophica ion ca e in na al lake a di inc ion i ome ime made be een 'na inp in l i3.1(i159 J0.123 To)16i 5(io) ohg.2(n)8

ca ie fe ili e , pe icide , edimen , and/o ind ial e en ha accele a e e ophica ion hen di cha ged in o a e bod (Smi h e al .1999). Wi h e e e e ophica ion; h poic condi ion o en e l, di p ing no mal food eb and eco em p oce e food eb and eco em p oce e b c ea ing dead one– he e no animal life can be ained (Sma a 2008). In 1960' lake Wa hing on (Sea el , USA), a one of he mo p blici ed eample of an h opogenic e ophica ion. A he ma im m e ophica ion lake Wa hing on ecei ed 20 million gallon of a e a e e en each da (Edmond on 1991). f om de eloped ag ic l al and a e land e age he lake; im la ing plan and algae g o h ha choked o mo o he pecie (Edmond on 1970). Lake and e e oi de e io a e h o gh e ce i e addi ion of plan n ien ; o ganic ma e and li , hich combine o p od ced inc ea ed algae and oo ed plan bioma , ed ced a e cla ing and all dec ea ed a e ol me (Ha pe 1992).if lake e e a a d inking a e o ce e ce i e algal g o h clog in ake inc ea e co o ion of pipe , make l a ion mo e e pen i e and o en ca e a e and od p oblem [10]. Algal emo al al o inc ea e l a ion co fo ind ie ing e opic a e . People gene all nd clea a e en e ae he icall plea ing hen bid clo d a e bo h Social impac and economic a e impo an and e ophica ion con ol nece a . When pho pha e a e in od ced in o a e em , highe concen a ion ca e inc ea ed g o h of algae and plan . A he n ien o ce highe le el pe i and condi ion emain fa o able, algal bloom can become long- e m e en ha ha e an impac on eco em.

Algae end o g o/ e ickl nde high n ien a ailabili , b each algae i ho li ed, and he e l i high concen a ion of dead o ganic ma e ha a deca e deca p oce con me di ol ed o gen in a e , animal , and plan die o in la ge n mbe . Addi ionall ; ained bloom ed ce o block o nligh pene a ing he a e , e ing o killing a a ic plan in e e e ophic condi ion ha mf l algal bloom (HAB) a e bloom ha can ha e nega i e impac on he o he o gani m d e o he p od c ion of na al o in , he in ic ion of mechanical damage o o he mean .

C

When p o ec ing na al en i onmen people li e in, e m p e en con amina ion f om en e ing he a e a and p o ec hei na al co ido .

e e i e , lake and eam a e he life hood of comm ni ie , e peciall in de eloping co n ie . Poll an of he e a e a a e iden i ed in ca ego ie : poin o ce con amina ion ch a ind ial/ man fac ing facili ie and non-poin o ce o m a e no f om b ilding a ea . Con amina e incl de oil and g ea e f om oad . Fe ili e /pe icide f om a m and la n , and con amina ion come h o gh chemical f om ind ial/comme cial a ea o emo e poll ion f om a e a .

Geo-life de ign em ha e l a ion ind ial con amina ion and e en ion em ha e l a ion fo ind ial con amina ion and e en ion pond em i h biological plan ing cheme , ch a bio- e age and open e en ion pond em fo o ganic con amina e . e e em a e de igned o emo e poll ion befo e i o o lake , eam , i e and e en all he ocean .

e e em a e no e pen i e and can be pa of na al co ido h o gh comm ni ie ha p o ide afe d inking a e fo people o e a place fo ild life o li e and f e h a e l e ed ai fo all life. Vege a ion along he e e o ed a e a emo e con amina e f om a e a and ca bon- di- ide f om a mo phe e.

Clean a e Plan de ign and con c d inking a e em .

A an ample, o A enic Remo al Fil e De ign i being ed (f ee of cha ge) b mo e han 35 Nonp o and NGO a o nd he o ld, o b ild l e in comm ni ie in al a ea he e a enic poi oning i a p oblem. P o iding clean d inking a e i ha e he ha e been ained fo a ci il enginee and planne . We ha e decade of e pe ience in cleaning con amina ed d inking a e and opping poll ion f om o ing o o a e o ce he e in he Uni ed S a e . No e a e p ing hi e pe i e o k in de eloping co n ie

Al o / e help .o in .all f e h/ a.e / ell / i.h hand p mp fo .he en.i e comm ni. , o no one ha .o go / i.ho .. And / e in e .iga.e .he ca , e of/ a.e / a poll .ion,/ hich co ld come f om ind , . ial o ce o local fa m . Once / e nd / he e .he poll .ion i coming f om / e de ign lo/ co . / a.e . ea.men. , , .em .ha. a e imple b . e ec.i e / hen .o ic poll .ion o/ ing .o local / a.e / a , i , .opped, .he en.i e comm ni. bene . / i.h clean / a.e . E e one in .he a ea become heal.hie . i i / ha. / e ha e been . ained fo a ci il enginee , and planne , . We ha e decade of e pe ience in , .opping poll .ion f om o/ ing .o o , / a.e / a , .

"dead" b .he p e, d e .o .he high le el of n . ien. accompanied b e ce, i e g o/ .h of algae, h kill , and anae obic bo..om edimen. . e i. a.ion fo ni. ogen, a fo pho pho , / a i.e . a iable f om co n. .o co n. . Dani h, .a.i .ic indica.ed .ha. man e con. ib .e a. lea . 50% of .he leaching of ino ganic N (Jol , 1993). Ni. ogen f om ag ic l. al non-poin. o ce in .he Ne.he land amo n.ed .o 71% of .he .o.al N load gene a.ed f om / i.hin .he Ne.he land (ECE, 1992). A d b R ding (1986) in S/ eden demon . a.ed ho/ lake / hich / e e na ec.ed b ind . ial o m nicipal poin. o ce , nde / en. long-.e m change in n . ien. .a. a a e l of ag ic l. al ac.i i.ie in .he / a.e hed. O e .he pe iod 1973-1981 .he n . ien. .a. of Lake O en inc ea ed f om 780 .o 1000 mg/m3 fo To.al-N and f om 10 .o 45 mg /m3 fo To.al-P. Lake . an pa enc declined f om 6.2 .o 2.6 m and

i e emel d namic and comple e peciall he mic obiological p oce e pon ible fo mine ali a ion, a ion and de-ni i ca ion of oil ni ogen. Gene all , in oil ha a e no a e logged, oil N (held a p o ein in plan ma e) and fe ili e -N a e mic obiologicall an fo med o NH4 (ammoni m) h o gh he p oce of ammoni ca ion. e ammoni m ion i o idi ed b o g o p of

Fo pho pho , , / hich .end .o be a ociа.ed / i.h .he olid pha e (edimen.), no lo e a e di ec.l linked .o e o ion. e efo e .he economic of n . ien. con. ol .end .o be clo el .ied .o .he co . of con. olling no and e o ion. e efo e, .hi / ill be . ea.ed b ie he e. In pa .ic la , i. i ef l .o e amine .he economic co . of n . ien. no / hich m . be eplaced b fe .ili e if .he land i .o emain p od c.i e.

e link be. een e o ion, inc ea ing fe .ili e applica.ion, and lo of oil p od c.i i. i e di ec. in man co n. ie . In .he B a ilian .a.e of Pa an / he e ag ic l. e i .he ba e of .he .a.e econom , Pa an p od ce 22% of .he na.ional g ain p od c.ion on onl 2.4% of .he B a ilian .e i.o . Ag ic l. al e pan ion in Pa an occ ed mainl in .he pe iod 1950-1970 and / a "cha ac.e i ed b ho .- .e m ag ic l. al , .em leading .o con.in o and p og e i e en i onmen.al deg ada.ion a a e l. of economic policie and a .o. all inapp op ia.e land pa celling and ma ke.ing , .em" [12]. E o ion ha led .o e en i e lo of .op oil, la ge- cale g ll ing (Table 1), and il.ing of di.che and i e. e e of fe .ili e ha i en a a con e ence, p 575% o e .he pe iod 1970-1986 and / i.ho .an gain in c op ield . Lo of N-P-K f om an a e age e o ion of 20 ./ha/ ep e en. an ann al economic lo of US$242 million in n . ien. .

A

A ac l. e i a pecial ca e of ag ic l. al poll .ion. e e a e ./ o main fo m : land-ba ed and / a.e -ba ed .em . E en. con. ol a e po ible on land-ba ed .em ; ho / e e / a.e -ba ed .em p e en. pa .ic la p oblem . A ac l. e i apidl e panding in mo . pa . of .he de eloped and de eloping / o ld, bo.h in f e h/ a.e and ma ine en i onmen. . In con. a ., coa .al 1 he ie in mo . co n. ie a e declining.

e en i onmen.al impac. i p ima il a f nc.ion of feed compo i.ion and feed con e ion (faecal / a .e), pl a o .ed chemical ed a biocide , di infec.an. , medicine , e.c. Wa .age of feed (feed no. .aken p b .he 1 h) i e .ima.ed .o be 20% [13] in E opean a ac l. e. Wa .e feed and faecal p od c.ion bo.h add b .an.ial n . ien. loading .o a a.ic .em .

Addi.ional en i onmen.al p oblem incl de i k of di ea e and di ea e . an fe .o / ild 1 h, in. od c.ion of e o.ic pecie , impac. on ben.hic comm ni.ie and on .he e . ophica.ion of / a.e , in.e b eeding of e caped c l. ed 1 h / i.h / ild 1 h / i.h con e en. gene.ic change in .he / ild pop la.ion.

T adi.ional in.eg a.ed a ac l. e .em , a in China, / he e e/ age- 1 h c l. e i p ac.iced, can be a .abili ing in ence in .he en.i e eco .em [14]. i i ecommended, e peciall in de eloping co n. ie / he e / a.e and e o ce a e, ca ce o e pen i e.

E . ophic and h pe . ophic lake .end .o be hallo / and fe om high a.e of n . ien. loading f om poin. and non-poin. o ce . In a ea of ich oil ch a .he Canadian p ai ie , Lake Bo..om edimen. a e comp i ed of n . ien.-en iched oil pa .icle e oded f om o nding oil . e a ociа.ion of pho pho / i.h edimen. i a e io p oblem in .he e .o a.ion of hallo / , en iched lake . P-en iched pa .icle e..le .o .he bo..om of .he lake and fo m a la ge pool of n . ien. in .he bo..om edimen. .ha. i eadil a ailable .o oo.ed plan. and / hich i elea ed f om bo..om edimen. nde condi.ion of ano ia in .o .he o e l ing / a.e col mn and / hich i ickl .ili ed b algae. i pho pho pool, kno / n a .he "in.e nal load" of pho pho , can g ea.l o e. an mea e .aken b i e ba in manage .o con. ol Lake E . ophica.ion b con. ol of e e nal pho pho o ce f om ag ic l. e and f om poin. o ce . Hi .o icall , d edging of bo..om edimen. / a con ide ed .he onl mean of emedia.ing n . ien.- ich lake edimen. ; ho / e e , mode n .echnolog no / p o ide al.e na.i e and mo e co .-e ec.i e me.hod of con. olling in.e nal load of pho pho b o gena.ion and b chemicall . ea.ing edimen. in. .o immobili e .he pho pho . Ne e .hele , lake e .o a.ion i e pen i e and m . be pa . of a comp ehen i e i e ba in managemen. p og am.

C

H man ed ced e . ophica.ion ha e hea il deg aded f e h / a.e .em / o ld/ ide ed cing / a.e ali. and al.e ing eco .em . c. e and f nc.ion, pop la.ion g o / .h apid ind . iali a.ion and e ce i e e of fe .ili e ha e e l.ed in di p opo .iona.e amo n. of pho pho o in lake .im la.ing plan. and algae o e g o / .h. Wi.h .he demand fo f e h / a.e e o ce e pec.ed .o inc ea e b .an.iall (Jo gen on e. al 2001). e e an.h opogenic in ence ha e e e en i onmen.al and economic epe c ion . Ul.ima.el , i. i impe a.i e .o inc ea e p blic a/ a ene and .he en i onmen.al ed ca.ion of ci.i en and al.o de eloped an in.eg a.ed . a.eg .o aba.e e . ophica.ion [15]. Onl collec.i e comm ni. e o . can mo e e ec.i el ed ce n . ien. inp . .o lake (e.g. b ed c.ion in de.e gen. e) and b ing c l. al e . ophica.ion nde con. ol. Do ble food Yield in la.e e i e a .enfold inc ea e in f el, fe .ili e and pe .icide [16]. e bl e - g een algae ome of / hich ha e gela.ino cap le and .h i e on o ganic poll .ion, .h clogging p blic / a.e pplie and c ea.ing n i ance in ec ea.ional lake . Ecolog i conce ned no. onl / i.h o gani m b . / i.h ene g o / and ma.e ial c cle on .he land, in .he ocean , in .o ai , and in f e h / a.e , ecolog .

Wa.e poll .ion con. ol peciali . ha e, in .he pa . failed .o nde and .he e ela.ion hip and ha e a..emp.ed .o ingle o . one fac.o a .he ca e of nde i able b . n .able algal bloom e l.ing f om poll .ion. (One p oblem one ol .ion nd ome) .he . a.eg of / a.e poll .ion con. ol m . in ol e ed cing .he inp . of all en iching and .o ic ma.e ial , no. j . one o . / o i.em banned.a geog aphe M.G. Wolmann 1971. Ha concl ded .ha .; demand on / a.e e o ce a e inc ea e a.e .ha e ceed .he a.e of in .alla.ion of / a .e . ea.men. facili.ie . Change in f e h/ a.e a ailabili. / ill con e ence of global clima.e change. Wa.e managemen. m . adap. .o e ec. of clima.e change b adop.ing a ho .alic app oach .o managemen. eco .em on a egional ba i . Ino ganic fe .ili e in e/ age . ea.men. e en en.e ing lake inc ea e .hei p ima p od c.ion a.e and change .he compo i.ion of .he a a.ic comm ni. . E . ophic / a.e e i e cool clea o gen ich / a.e ma di appea ; g o / .h algae and a a.ic plan. ma become o g ea a .o in.e fe e / i.h , / imming o n- decompo ed di ol ed o ganic ma impac. a bad .a .e .o / a.e e en a e i. ha pa ed .h o gh / a.e p i ca.ion .em . E o . .o di e . m nicipal / a .e f om ce .ain lake ha demon . a.ed .ha. c l. al e . ophica.ion can be e e. ed in .he en e .ha. ome lake / ill e. n .o le fe .ile condi.ion / i.h imp o ed / a.e ali. in .e m of h man e (Edmond on, 1968).

So ce of pho pho o Ag ic l. e =62%, majo .o/ n=-9%, ind . =1%, Sep.ic Tank=14%

1. Change in / a.e ali. .ha. can ha m o gani m o make n 1 fo H man e
2. Con.amina.ion / i.h Chemical
3. E ce i e Hea. .

A

e a ho i g a ef l o IITM P ne and IASC Bangalo e p o ide aining Wo k hop and Na ional confe ence p o ide a mo phe e of ea ching i h cien i c ea ch pape in e ac ion in f e f nd i needed fo f e ea ch in i e cleanline and a e hed Managemen . A ho hankf l o Di ec o G eg Ei he . LG onic U.S and Chief Wa e Scien i . LG Sonic US h i EJ Neaf e .

References

1. FAO (2013) The Sate of Food Insecurity in the World: The Multiple Dimensions of Food Security. FAO 4-6.
2. Hassan A, Bhuiyan AB (2013) Microcredit and Sustainable livelihood: An Empirical Study of Islamic and Conventional Credit on the Development of Human Capital of the Borrowers in Bangladesh. J Econ Cooperation Dev 34(3):101-128.
3. Mekuanent M (2014) Determinants of Household Food Security among Southwest Ethiopia Rural Households. **Food Sci Technol 2(7):93-100.**
4. Planning and Development Commission (2018) Poverty and Economic Growth in Ethiopia 1995/96-2015/16.
5. Obayelu OA, Adepoju AO, Idowu T (2014) Factors Inþuencing Farmersؚ Choices of Adaptation to Climate Change in Ekiti State, Nigeria. J Agric Environ Int Dev 108(1):3-16.
6. Olsen C, George M (2004) Cross-Sectional Study Design and Data Analysis. Yes Comp 2-53.
7. Paulos A, Belay S (2017) Household and plot-level impacts of sustainabl J خa M $ J خ i ضر ٨ ٨' "