Discussion

The mean concentration of Cd, Cr, Pb and Cu observed in this study were higher than the values reported by Otene and Alfred-Odaiya (2019) in Elechi creek. The values were also higher than the values reported by Eletta (2007) in Asa River but in agreement with the values reported for Cd, Cr, Pb Ni and Cu from public water supply in Kaduna Metropolis by Kazaure *et al* (2015). The values were also in line with the finding of Joseph *et al* (2012) in Lake Chad, Baga, North Eastern Nigerian except chromium value which was completely contrary to this result.

The higher values of metal concentration in sediment than water observed in this study is in line with the finding of Davies *et al* (2009) in Elechi Creek where all the metals studied concentrated in sediment than the water. This result is also in conformity with that of Otene and Alfred-Ockiya (2019) with sediment metal concentration higher than that of the water.

The high concentration/accumulation of metal in the water and sediment above the required or permissible limit of WHO (1993,2006), WPCL (2004) ,CCC(USEPA,2006) and CMC (USEPA,2006) is also in line with the finding of Joseph *et al* (2012) in Lake Chad, Baga, North Eastern Nigerian. This observation is also in agreement with the finding of Maitera *et al* (2011) in River Gongola, Adamawa state Nigerian where metals such as Cr, Cd and Pb were present above the required / permissible limit of WHO (2006). According to Maitera *et al* (2011) higher concentration of heavy metals in sediment than water is normal since sediments are considered to be metal reservoirs. Ademoroti (1996) opined that higher presence of heavy metals in sediment than water is normal because metals are originally found to reside in sediment. According to Mason (2002), higher levels of Cd and Pb in any water body could be attributed to huge agricultural and industrial discharge into the area. Hardman *et al* (1994) also opined that high concentration of Pb in water could be attributed to spill of leaded petrol in automobile cars and heavily traveled roads running along the lake while Banat *et al* (1998) attributed it to proximity of water body to highways and large cities due to gasoline combustion. Hamed, (1998) and Nguyena *et al* (2005) also reported higher accumulation of metals in sediment than water owing to the fact that sediment acts as reservoirs for all containments and dead organic matter descending from the ecosystem above.

Conclusion/ Recommendation

Considering the result of this study Elele-Alimini stream is contaminated by the heavy metals Cd, Cr and Pb since their concentrations in both water and sediment exceeded the WHO, EU, CCC and CMC permissible limits for natural water and Oral reference Dosage (RFD) for sediment. The prolonged presence of these heavy metals in this water body might affect aquatic life and eventually threaten the life of the inhabitants of the area. It is therefore recommended that continuous monitoring need to be carried out to determine the long term impact of anthropogenic activities in the area to ensure the safety of health of man and that of aquatic life.

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