the upper, mid, and lower regions, covering a distance of 50 km and a range of salinities from freshwater in the upstream area to seawater at the mouth. Subsamples were taken from the uppermost layer of the sediment taking care to minimize contamination. e samples were frozen a er collection and later thawed, dried at 50-60°C in an oven and disaggregated in an agate mortar, before chemical treatment for total metal analysis. For each sample a known quantity (1 g) of sediment was

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(6.8%) > acid reduction (3.2%). Assuming that bioavailability is related to solubility, then metal bioavailability decreases in the order of exchangeable forms > acid reduction forms > organic forms > residual forms [6,24]. e residual forms are not expected to be released under normal conditions in nature [6] and could be considered as an inert phase [24].

Metal availability is also in uenced by other characteristics of the sediment system such as pH and organic matter content, which control the solubility and therefore the availability of metals [25]. Among the non-residual fractions, the organic matter fraction was much higher than other fractions in all sites. e percentage of cadmium in the non-residual fractions was greater than the residual fraction. About 73% of the cadmium in sediment was associated with the exchangeable, acid reduction and oxidation fractions. Forstner [26] reported that cadmium was characteristically enriched in the more mobile fractions and more mobile than most of other heavy metals [27]. e present results indicate that cadmium, cobalt and lead have greater potential for mobilization from the sediments than copper, nickel and mercury because of their higher concentration at the acid reduction fraction.

Organic matter has a high speci c storage capacity for heavy metals [18]. Acidic pH condition is known to in uence the sorption of lead by organic matter fraction in sediments [6]. Analysis of pH and percentage of organic matter present in sediments concluded that there were strong correlations between each of these factors and the concentrations of copper and lead. Results showed that the concentration of heavy metals at oxidation fraction increased with increasing pH levels and percentage of organic matter present in the sediments.

A direct correlation was carried out between organic matter percentages, pH and concentration of heavy metals at the oxidation fraction. ere was no signi cant correlation between concentration of cadmium with organic matter percentage and pH ($p>0.05$). e result of Pearson correlation (r) for organic matter for copper was 0.75 ($p<0.001$), which means that there was a strong linear correlation with organic matter. ere was a linear correlation between lead and the percentage of organic matter in the sediment ($r=0.55$ and $p<0.01$), copper ($r=0.64$ and $p<0.01$). us, organic matter shows a signi cant to bind copper and lead the sediment in Arvand river. ere was a linear correlation between copper and pH ($r=0.69$ and $p<0.01$) and lead and pH ($r=0.80$ and $p<0.01$).

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