令和元年度　環境科学院　修士論文内容の要旨

Microplastic pollution due to anthropogenic factors in river sediments of Jakarta northern part areas

（ジャカルタ北部における河川堆積物の人為的要因によるマイクロプラスチック汚染）

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It is widely accepted the presence of small fragment of plastic identified as microplastics. Microplastics are incredibly high spatial and temporal variability, because it could be present anywhere including terrestrial, marine and freshwater ecosystems. Especially estuarine is considered to be one of main important source of microplastics to marine ecosystem. As the estuarine may work as a transitional and accumulation place between marine and freshwater ecosystems, it is important to understand actual situation for evaluating anthropogenic pollutants. Our approach is to quantify microplastic abundance in four rivers in North Jakarta area, and to investigate driving factors of microplastic abundance. This study also included the importance of human behavior and/or consideration as indirect factors of microplastic abundance in the river. River sediments were collected from each river in the area. And microplastics were extracted by density separation and quantified by stereomicroscope and ATR-FTIR to analyze polymer type. Social survey was also conducted in 152 household in the same area to assess people behavior toward plastic waste.

As results, it was noted that amounts of microplastics (5533 particles Kg^{-1} of dry weight) in Ciliwung River were highest than those in other three rivers. In addition, amounts of microplastics in upstream were significantly higher than those in downstream. According to the sorting types, microfiber was dominance type present with 3000 particles Kg^{-1} of dry weight at the highest point. This study is in contrast to previous study about Jakarta Bay Area which showed that microplastic abundance was higher in downstream than those in upstream. Although these findings were not fully comparable with those in present studies regarding of point locations and distance, microplastic abundance was indicated to be affected by population density, land use area and waste infrastructures. Social survey also indicated that due to limited space in the home, people did not separate garbage. In future, it will be needed to investigate direct impact of fisheries and aquaculture as source of microplastics. To understand the effects of microplastic, It would be beneficial to analyze diffusion of microplastics into environment through human behavior perspective.