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Plastic Wastes Survey in River Mouths Discharging to Manila Bay

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This study reports on the amount of plastic wastes in five river mouths discharging to Manila Bay, a natural harbor which drains approximately 17,000 km³ of watershed area. Of the 17 rivers discharging to the Bay, five rivers which run through the densely populated and highly urbanized Metropolitan Manila are included in the study namely, Pasig, Cañas, Tullahan, Meycauyan and Parañaque. A Waste Analysis and Characterization Study (WACS) was conducted to investigate the composition of the wastes that were on the river banks. Samples were taken from the wastes that were found lying on the banks. The wastes collected in each study site varied from each other, although plastic wastes and yard wastes were gathered from all areas. Based on their % wet weight, plastics alone comprised 28% of wastes in Cañas, 46% of wastes in Meycauyan, 42% of wastes in Parañaque, 37% of wastes in Pasig and 27% of wastes in Tullahan. The disposed plastics collected were also characterized and categorized into different types: hard plastic (PP, HDPE), film plastic (PP, PE), foam (PS, PUR) and other type (PVC, PET). In Cañas River, film plastics (79%) were the most ubiquitous type of plastic waste which primarily consist of different sachets of household products and single-use plastic bags. Few hard plastics and other types of plastic such as PVC and PET were collected. Meycauyan River and Parañaque River had almost the same plastic type distribution wherein the most dominant plastic type were hard plastics. These hard plastics collected were mostly composed of bottles of detergents and toiletries. Meycauyan River has relatively fewer establishments near its river mouth, indicating that the sources of the accumulated plastic wastes came from the mid and upstream of the river where the urbanized and industrialized areas were located. Furthermore, even though hard plastics represented 38% of wastes in Paranaque, numerous plastic straw ropes were collected as fishermen use these straws to tie up their boats to the docking area. Significant amount of foams and PET bottles were also amassed in these rivers. Plastic wastes from the Pasig River were mostly comprised of both film plastics (39%) and hard plastics (30%). The plastic wastes taken were all household products directly dumped by the those residing by the Pasig River mouth. Notable quantity of foams and other types of plastic were fetched from the sampling area. Tullahan River has abundant amount of film plastics (35%) and foams (33%) in its river mouth. Some of these plastic wastes are stuck to the rafts tied up along the bank of the river. Sachets of household products were dominantly present. Few hard plastics and other type of plastic were extracted from the site. Substantial amount of plastic wastes in each of the river mouths signifies poor waste management infrastructure, lack of materials recovery facilities, and lack of discipline of people as these plastics are found to be directly dumped into the water bodies.

