

International Field Appraisal I

201421168

Yuko Yamane

Urbanization is following Vietnam quickly in recent years. As a result, it has various problems, such as water pollution of a river, aggravation of air pollution, and unsuitable processing of waste, centering on urban areas. In this program, I focused on water pollution problem in Vietnam. What was the most impressive place for me in this program is reservoir used in dry season in Hanoi. Some of the water flowed the reservoir was waste water treated in sewage treatment plant near the pond. Water after the treatment seemed to be very clear, I could also observed some fish were sticking up. However, I found some data that showed most of waste water were flowing in river. I think the inflow of untreated water into river must be a main reason to cause water pollution in Vietnam. Here, I would like to consider the solutions to solve water pollution problem in Vietnam.

First of all wastewater treatment is not been done properly in Vietnam. As shown in Table1, in 2007, about 70% of waste water was flowed into river with no treatment. In addition, during 2004 to 2007, the amount of wastewater that was not processed was decreasing year by year. It should be noted that, in the economic development plan, up to 2020, it will have set 49% as a target of Sewerage Coverage in Hanoi, but still over half of waste water flow into the river. By the influx of non-treated waste water, pollution of the water quality of the river is severely going on. As shown in Figure 1, in some industrial areas, concentration of BOD in waste water was significantly higher than the reference value. High BOD concentration will increase the number of bacteria including pathogens in the water. In addition, shown in Figure 2 it could not be seen that the improvement of water quality parameters during 2006 to 2008. By those data more efficiently wastewater treatment is essential for the improvement of water pollution in Vietnam.

Then, how is waste water treatment in Vietnam performed? It is an activated sludge method. Activated sludge process is decreasing the organic pollution substance contained in waste water by using a group of many different types of microorganisms in sludge. Various microbes are contained in activated sludge and the increase in efficiency of effluent treatment is aimed at our laboratory paying attention to the microbe in this activated sludge. Our focus is nitrogen elimination process. Nitrogen is emitted into the air through a process called nitrification and denitrification in the nitrogen compound

in waste water. In this process, nitrification is a rate-limiting process. As for the physicochemical techniques, such as temperature, oxygen concentration, and pH, all condition examination was carried out, and active improvement has greeted the limit. Furthermore, by these methods, in order to act on the whole activated sludge, the amount of sludge will increase. The main disposal methods of waste sludge are thermal disposal and reclamation, and it is known that cost high, so the new approach method that only activate nitrification is required. Then, what our laboratory focusing on is signal molecules. Signal molecules are like the languages of the microbe recognized by only the specific microbe. For example, only Japanese and some foreigner who study Japanese can speak Japanese. One signal molecule is only sense by specific bacteria. By adding the signal molecules which improves nitrification specifically into the activated sludge, Nitrification can be improved specifically, without increasing the quantity of activated sludge because other microbes cannot recognize the signal molecule.

In Vietnam, while urbanization progresses, various environmental problems, such as traffic maintenance, air pollution and water pollution, are still present. Water is indispensable for human beings, and it is possible that contamination of water quality affects not only a life of people but the ecosystem of a river or a lake. Untreated waste water contains so much organic matters, so it will increase some toxic bacteria. It is said that water pollution becomes various sick causes. Diseases such as diarrhea, cholera, typhoid, hepatitis A, and a parasitic disease, are caused by water pollution. Especially, most diarrheas are depended on shortage of clean water and inferior health environment. I will write my actual example; I was suffered from diarrhea in Vietnam. I could not cure the diarrhea after going back to Japan, so I lived a life of only drink about one week, and was very hard days for me. To prevent untreated waste water flowing into river and prevent some serious disease, we would like to advance improvement in new effluent treatment efficiency which used the microbe.

We warmly welcome urbanization of Vietnam, but environmental pollutions are not. I hope no one is troubled by water pollution in the future.

Year	2004	2005	2006	2007
Water Coverage (%)	59	65	69	69
Sewerage Coverage (%)	42	40	33	33

Table 1 Water Coverage

Population with access to water services (either with direct service connection or within reach of a public water point) as a percentage of the /total population under utility's nominal responsibility
 Sewerage Coverage : Population with sewerage services (direct service connection) as a percentage of the total population under utility's notional responsibility
 (IB-NET) (<http://www.ib-net.org/IBNetProduction/>)

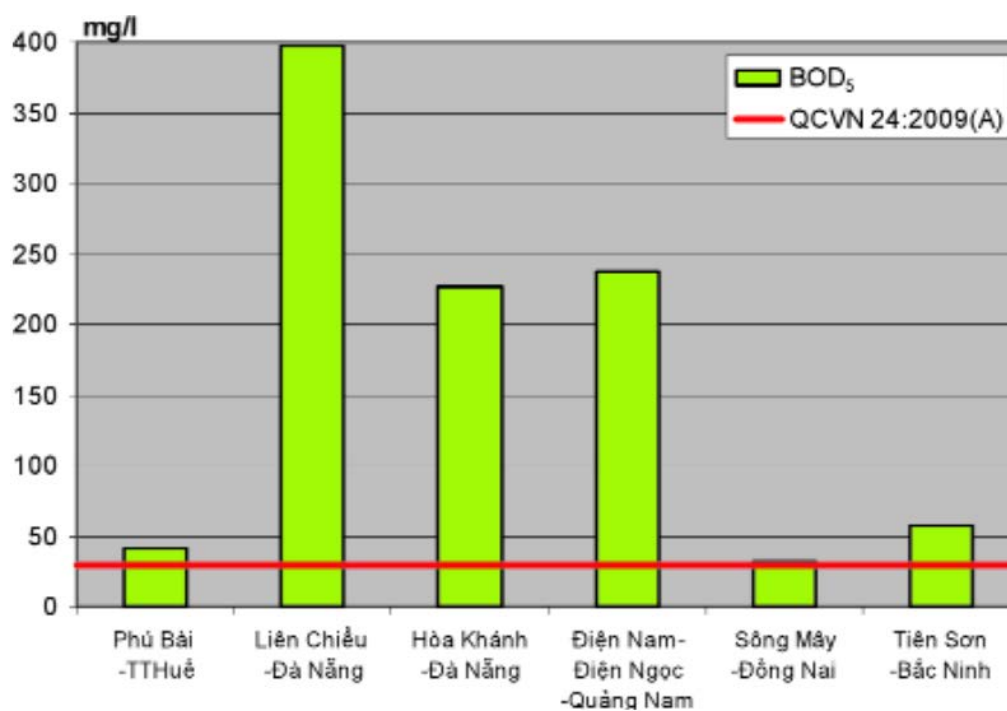
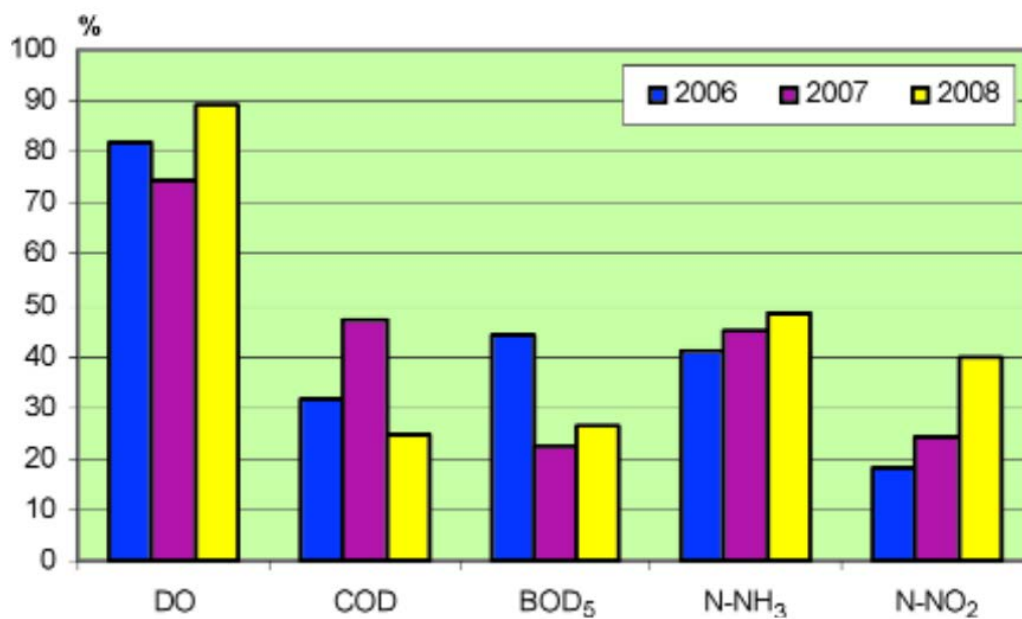


Figure 1 concentration of BOD in waste water in industrial area (2008)

環境庁 ベトナムにおける環境汚染等の現状



Frequency of excess pollutants beyond environmental standards of
 Bien Hoa Province Dong Nai River (2006~2008)

環境庁 ベトナムにおける環境汚染等の現状