課題研究動画発表会でのプレゼンテーション原稿

Onuma Environmental Survey ~The Relationship Between Onuma and Livestock~

From now on. We would like to report on the “Onuma Environmental research” conducted by the first year students of Hokkaido Hakodate Chubu High School.

What we’re going to talk about in this presentation is roughly divided into these five things. First, we’ll talk about the background of this survey. We joined the seminar of Tanaka Kuniaki who is the ex-professor in Hokkaido University of Education Hakodate School. In the seminar, we understood that there is a big relationship between Onuma’s water quality and the livestock around there. After that, we went to Onuma, and surveyed the water quality of lake and surrounding the river by using a pack test. Onuma town has done some initiatives to improve the water quality. Currently, Onuma has failed to meet the goals of environmental standards. This year, we could not get enough data due to COVID-19. Thus, we will suggest how the livestock should be handled to improve the Onuma’s water quality how consider the data of Hakodate Subprefecture, given Mr.Tanaka also how to research using the Internet. Here, I will briefly explain Onuma.

Onuma was formed by the eruption of Mt. Komagatake, which caused the Orito river to flow and was damned by the mudflow hill. You can see the detail here. In addition, Onuma was registered in the Ramsar Convention Wetlands in 2012. Please take a look at this table. There are a lot of animals and plants inhabiting there. Also, there are specific exotic species such as bullfrog and scorpionfish inhabiting there, too. About the water quality, outbreaks of blue-green algae are observed in the water almost every year. Especially, there are reports that it occurs one week after heavy rain. It seems that the water-bloom occurs because of heavy raining caused sediment draining Onuma Lake. There are lots of dairy cows and cattle around Onuma.

Next let me talk about our results and discussions. Regarding the reference value of the water quality, the Chemical Oxygen Demand (COD) is set by the governor of Hokkaido as a consolidation of the water quality in Onuma. At first, the 75th percentile of COD exceed the allowable limit set by the Environment Agency, both of Onuma and Konum’s Environmental reference point as you see. However in 1991, because of legislation requiring farmers to dispose of manure properly, it is decreasing.　Next, the relationship between water quality and the number of cattle. In this case, we focused on beef cattle impact. Onuma’s COD increases when the amount of cattle increases.

Besides, imported meat was free and started in 1990. Bovine Spangiform Encephalopathy (BSE, mad cow disease) infected cows were discovered in Japan in 2001. BSE infected a person in Japan in 2006. From this Onuma’s COD decreased when beef cattle decreased.

Therefore, we thought understandings beef cattle are an important factor for improving Onuma’s water quality. In addition, the area around Onuma is in a valley, so the water pollution is made

worse by the shape of the land. Polluted rivers drains into Onuma and the water gathers in the Onuma Lake. For the above reasons, the cause of the water pollution is related to cattle farms. One of the reasons is that their excrement is transported into Onuma through rivers when it rains.

Also, Nanae city has a biogas plant and they are working on a project where they reuse cow excrement. We found out that, not only excrement but also the leftovers are made into biomas. Then they are converted into electricity. The rest is made into liquid fertilizer with on-site inspection. Through this initiative, a problem has become clear to us. That is the energy conversion. The problem is that the Nanae biomas plant is a very important facility but the efficiency has been low because of its small-scale efforts to improve the water quality of Onuma. Even though the facility is vital, its energy conversion efficiency is low. Therefore we suggest the construction of a large-scale biomas plant. When we look for the same kind of construction that had been done in Hokkaido. We found a successful example with the biomas plant in Okoppe town. Okoppe spent five hundred seventy-four million and ten thousand yen on this construction and it contributes to their advanced business as a “Biogas industrial town.” If the large-scale biogas plant operates, the water quality of Onuma will be able to improve and it also can make an eco-friendly town development.

So, we suggest the plan using crowd founding. When we do this, it is not just about collecting donations, but also important for inventors to understand the blessing and role of Onuma’s ecosystem service from Onuma. And it is better to collect founds with their approval. Therefore, “Wise use”, one of the philosophies of the Ramesar Convention should become well-known by more people.If the dairy farmers donate to the manure processing, we will transport the manure free of charge. After that we will change it into fertilizer and return it. When non-farmers donate, we will use a mechanism like “Hurusato-nouzewi” to deliver local dairy products and vegetables, which are the blessings of Onuma, depending on the amount. If we use such a system, we expect to promote local production for local consumption. We have proposed a plan like this but there are many problems. For example, first, will the farmer do manure processing all the time? Second, will the town cooperate with this initiative? Third, will the funds actually be collected? As mentioned above, there are still many issues to be solved in improving Onuma’s water quality. However, based on these issues, we should like to continue to think about improving the water quality little by little. This concludes the proposal for the first year students of Hokkaido Hakodate Chubu High School.