

What's Glocal?

We entered Kisarazu National College of Technology five years ago and, are majoring in Urban Environmental Engineering. We have studied various subjects.

In surveying class we study in the classroom and then practice outside to acquire the technique. In structural mechanics, we designed bridges for various conditions, like different amounts of traffic and varying lengths of bridges. We also learn about the different materials that are used for building. Knowledge of concrete, asphalt, or steel is necessary.

Irrigation science gives us ideas of the flow of water. Understanding is deepened through experiments. We also study microorganisms and quality of water.

During graduation research in the fifth year we acquired this knowledge and wanted to deepen it, which lead us to go to a special two-year course in our college. Now we all belong to the department of environmental construction engineering, where we are required to pursue the special research.

I am conducting research on river reclamation for the preservation of indigenous plants and animals. In order to prevent natural disasters such as floods, many rivers in Japan have been altered. The riversides were concreted and the riverbeds made smooth. This makes it almost impossible for flora and fauna to live near these rivers. I am searching for a method that enables local people to restore small rivers to their original state. Rivers in villages were once a vital and familiar place for local wildlife and local people to enjoy.

I am researching the practice of drain purification. A lot of nitrogen is included in the drains of factories. By pouring the nitrous down these drains, factories are causing eutrophication to occur in the surrounding areas. The plankton grows at an abnormal rate, causing red tide. If this new processing method is established, this can be prevented, and the drains of factories would be efficient and cheap.

My research focus is examining the character of sand used for concrete. Concrete consists of cement, stone, sand and water. When sand or stones contain some harmful minerals, the concrete will crack, peel off, or simply fall. However, if we know some harmful minerals exist beforehand, we can take some measures to avoid the weakening of the concrete. By creating methods to examine the sand, we can make effective use of our limited natural resources.

During this summer vacation Sudo went to Malaysia. He is doing research in the field of water environment and became interested in environmental problems in developing countries. Two of us became interested in the environmental problems that he saw in

Malaysia. It made us start thinking about environmental problems in other countries as well.

I have no idea what Malaysia is like.

Well, Malaysia is one of the countries in Southeast Asia. It is located near the equator and has a warm climate all year round.

So, are the people there always happy?

You could say that. I saw many people singing on the buses.

By the way, why did you go to Malaysia?

One of the seniors at my school is doing research in Malaysia now. I went there to visit him.

What kind of research is he doing?

He is studying wastewater treatment in the palm oil companies.

What is palm oil?

Look at this. This is a palm oil forest. This forest covers two-thirds of Singapore. Palm oil production is one of the leading industries in Malaysia.

And these are the palm oil fruits. Palm oil can be turned into margarine and detergent among other things. These days, the palm oil is often used as bio-diesel.

So, how is the wastewater treatment related to that problem?

All right. I'll explain.

When they make palm oil products in the factories, they use a lot of water to steam and sterilize them. Tons of filthy water is discharged. The present treatment method is to pour the water into a pond and wait for it to ferment.

What does that mean?

First, please look at this video. This shows how the water ferments naturally. You can see that a lot of bubbles are foaming, right? This is methane gas. The filthy things in the wastewater are going out in the form of gas. Then the water becomes clean. But they are just pouring the water into the pond, and waiting. It takes a long time and is very inefficient.

Methane gas is one of the greenhouse gases, isn't it?

Greenhouse gases lead to global warming, don't they? To decrease those gases is one of the goals in the Kyoto Protocol, isn't it?

That's right. Team – 6% is talked among people.???

But that is CO₂, right? What about methane gas?

As this picture shows, the methane gas is 26 times as effective as CO₂ in causing global

warming. Methane is far more harmful to the earth. We need to develop a new way of treating wastewater in order to help prevent global warming.

As a matter of fact, methane gas can be used to produce electricity. This picture shows the machine they are using to promote a more effective methane discharge. The goal would be to clean the water and produce new energy at the same time, killing two birds with one stone.

And it doesn't add to global warming. It's technology that is friendly to the environment.

There are a lot of environmental problems that should be solved besides global warming. Acid rain, desertification, and the destruction of tropical forests are just a few other examples. They are all caused by human activities. Human beings have developed technology to improve their life. However, from now on, that is not enough. The aim of today's engineers should not just be to produce convenient technology, but also to take an active role in preserving the global environment. Our research projects are not global in size. In fact, they are rather local. However, if each of us takes some action in a small region or a particular field of study, together, we can make a significant impact in the struggle to preserve the global environment. The individual work of local engineers can have a global influence.

Now is the time to apply our research findings in the real world. We have been studying hard for years, and there is plenty of action that we can take. Let's put the motto "Think globally, act locally" into practice. In short let's be glocal!