To University of Zambia

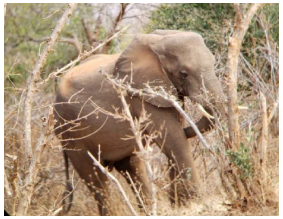
Mitsuru NAKASE, 5th year

My motivation for applying to Zambia program was to broaden my perspective by learning about diseases and their diagnostic methods, animals, ecosystems, and how livestock are kept, which I cannot see in Japan. The fourteen days I stayed in Zambia were full of discoveries and surprises. In this report, I would like to describe the most memorable scenes in the national parks and the cattle situation in Zambia.

After taking lectures on parasitology, bacteriology, and virology at the University of Zambia in the first week, we went to Lower Zambezi National Park in the second week. I had imagined the savanna to be reddish-brown soil with short grasses and lions resting on them, but it was actually rather thin shrubland, and I couldn't see any lions. Because it was the dry season, vegetation near the ground was poor, and the soil was bare in large areas. The most common animals we saw were impalas. There were a lot of them, partly because the visibility was good. I was impressed by the amount of resources available to support such a large number of herbivores even during the dry season. It brings me thought of Sika deer that survive the winters in Hokkaido, which are probably much tougher than the dry season in savanna. I was delighted to be able to feel the vividness of birds, the size of rabbit's ear, the large population of hippopotamuses, the pain of a tsetse sting, the size of a baobab, the dignity of a kudu, the abundance of leguminous trees, and the abundance of anthills.

Baobab is believed to bring rain (@Lower Zambezi NP)

In the bush, there were many animal trails that were wide enough for small cars to pass through. Elephants are playing a major role in creating such paths. When elephants were in the bushes, we could hear the sound of elephants breaking branches with their noses and stepping through the grass. Gaps were naturally formed around the paths that the elephants made. We also saw a lot of undigested elephant dung here and there in the park. These droppings should be very useful for spreading seeds. We could feel the great impact that elephants make on the vegetation of the savanna. As a side note, on the third day we visited Lusaka National Park, where there are no wild elephants, I remember that the proportion of forest was higher than that in Lower Zambezi, and there was less open land. I think this is because of the lack of elephants.



A young elephant in the bush (@Lower Zambezi NP)

I was also impressed when I visited Conservation Lower Zambezi (CLZ), an NGO that conducts conservation activities in the national parks. CLZ holds training camps for elementary school students living near the national park to teach them why we need to protect wildlife. They don't just teach them in the classroom, but actually take them on tours of the national park by car and boat, so that they can experience the magnificence of the animals directly. I wondered why this kind of education is necessary for children who live in an area that is supposed to be familiar with wildlife. The answer to that question shocked me. Wild animals are hated by some of the residents of the surrounding area because they destroy their farms and livestock. I could not imagine such a feeling, since I had lived in a urban environment. The purpose of the camp was to make children, who live in an environment where wild animals are considered enemies, realize the necessity of coexistence with animals, and then go home and tell their families how wonderful it is. CLZ is also involved in activities that encourage coexistence, such as building electric fences on farmland around the national park and teaching people how to make repellents using vegetables. These activities have been ongoing for 18 years and have clearly shown positive results, such as a decrease in the number of poachers. The number of animals such as elephants and raptors has increased due to the decrease of poachers, and the elephants are said to be gentler than those in other national parks where poaching is common. Rather than seeking a special solution to wildlife problems, I have learned that it is more effective to try to solve and coexist with wild animals through steady activities.

I would like to move on to the cattle situation in Zambia. In Zambia, cattle are mainly indigenous breeds that are smaller than those we usually see in Japan. What surprised me was the way they were kept. During our stay, I rarely saw cattle kept in fences or chained, and most of them were free-range. They were moving freely without being restricted by the boundaries of the land, crossing roads and grazing on the ground. Cattle were brought back to their owners before dark. Because of the way cattle are kept, theft of cattle is said to be a frequent occurrence. They also do not require much hoof trimming. Unlike concentrated-fed farming conducted in our country, cattle move freely and graze without restriction, and I saw the original role of cattle as livestock, which is to convert plants that humans cannot use into protein.

Inspection of organs (@slaughtorhouse)

In the living environment of cattle, there are many organisms such as arthropods including ticks, snails, and wild mammals that can carry or transmit pathogens. Of course, livestock get infectious diseases. In fact, at slaughterhouses, it was easy to see liver fluke and tapeworm in the liver. These parasites were removed with the fingers, and the livers were sold directly to the customers. In the slaughterhouse, I also saw carcasses hanging in the yard and their processing process, which made me understand why Zambians have a culture of cooking their meat well done. In terms of meat, I was impressed that livers, kidneys, and limbs were sold in supermarkets. Some of the meat was salmon pink in color and had a long sell-by date. Although the quality of the meat is not excellent, and there are problems with infectious diseases and the need to heat the meat for long times, I thought that this was one form of livestock farming that is not restricted by strict sanitary control, does not require excessive energy in the production process, and is easy to access meat.

After spending some time in Zambia, I realized that the seminar presentation usually done in English in my laboratory and English classes were very important to improve my English skill. I could discover many things that Zambia is superior to Japan and many issues that Zambia is facing. However, this time I only got knowledge, not any solutions, and I could not help any people. I strongly felt that I should acquire a wide range of knowledge and expertise and become a person who can confront actual problems.

Thanks to all the people who were involved in this training. I was able to open up a new world, and I truly appreciate the professors in University of Zambia and Hokkaido University and the students in University of Zambia, Ms. Oikawa who is in charge of IVEP.

To University of Zambia

Shiho NIWA, 5th year

My motivation for applying this program was that I wanted to learn about the relationship between pathogens, animals, and humans in an environment different from Japan. Another major theme was to see and learn about ticks in Zambia, because I am studying about ticks in my laboratory. In this report, I write mainly about what I learned about ticks. What impressed me the most during my stay in Zambia was the fact that many ticks suck blood from both large and small animals in Zambia, and that tick-borne diseases are a serious problem there.

At first, it was in a conversation at a student exchange event. I casually asked a student from UNZA what tick-borne diseases problem in Zambia are and how often he is bitten by ticks in his life. I was taught by him that people can be bitten by ticks even in their normal lives in Zambia and that the government is working to control ticks for livestock. I felt that problem of ticks is more important in Zambia than in Japan at that time.

The next day, we had a lecture and a practice about parasitology. I had been looking forward to learning about parasites (mainly ticks) in Zambia. During the practical training, I was able to see the ticks of the genus *Hyalomma*, which I had longed to see, and I was fascinated by the very beautiful appearance of the ticks of the genus *amblyomma*. However, despite their beautiful appearance, I learned that in Zambia, where livestock is often kept free-range, arthropod-borne diseases, such as theileriosis, babesiosis, and heart water disease, are very serious problems.

In the third day, we had a class about wildlife management. We were able to collect ticks at Lusaka National Park. On the way to the collection point, I saw a patch of burned grass. I was wondering why it had burned, so I asked, and the answer was that the grass is sometimes burned as a tick control measure. They don't do this in general national parks, but this national park is not so large that natural regulations don't work very well, and they need to do tick control for the wildlife. In addition, although people are not allowed to live in the national park, there is a game management area outside the park where people and livestock can live. In the game management area of this national park, they are controlling ticks by installing applicators to apply acaricide to animals that pass through the area. The amount of effort put into tick control showed me how much the problem of tick is large and the importance of tick control in Zambia.

When we arrived at the tick collection point, it was a dry open grassland with an artificial pond. I heard that animals often use the area around these artificial ponds, and it was impressive to see many droppings from various animals there. It made me think that ticks must be abundant where animals gather. Besides, I had had an image that ticks are sensitive to dryness, so I thought that Zambian ticks are more adapted to dryness than Japanese ticks. Furthermore, unlike Japan, which has four seasons, in Zambia, the rainy season is when ticks are abundant, and adult ticks lay their eggs during this period, while the number of ticks decreases during the dry season. I learned that these seasonal changes in ticks are also responsible for seasonal changes in tick-borne disease outbreaks. In addition to number of ticks, during the rainy season, the grass grows taller, so ticks are more likely to attach to animals. As described above, I was able to see the complex relationship between the environment, ticks, animals, and disease outbreaks by my own eyes. It was very interesting for me.

Moreover, it was not only livestock that suffer from bloodsucking by ticks and tick-borne diseases. On the 10th day of the program, I was able to see the veterinary clinic at the University of Zambia's Faculty of Veterinary Medicine and I also found several dogs with numerous ticks. I was told that because many dogs in Zambia are kept outdoors, tick-borne diseases are common even among dogs. I felt that this is very different from Japan, where dogs are often kept indoors.

On the last day, I saw medical treatment facilities for livestock in Shibuyunji. There was a medicated bath facility for cattle, and I was able to see cattle entering a pool filled with acaricide. In Zambia, there are free medicated bath facilities set up by the government in each area, and during the rainy season, cattle are brought to the facilities once every two weeks for prevention. I learned that tick control for livestock is quite important here, and the tick control is carried out in cooperation not only with veterinarians, but also with residents, researchers, the government, and various other people.

To summarize, during this program, I learned that ticks are a problem for both livestock and companion animals, and I thought the reasons for this were related to the fact that animals in Zambia are grazing freely and that there are many ticks in the field.

It was very interesting to me that the lifestyle and feeding method of animals is related to the high number of tick-related problems. I also thought that while the high number of ticks is a troublesome problem, on the other hand, it also means that there is an environment with many wild animals that maintain the ticks' life cycle. I realized how interesting it is that an environment different from Japan, pathogens (+ vectors) adapted to it, and people's lives are deeply involved in disease outbreaks. I also learned that ticks are considered a bigger problem in some overseas regions than in Japan, and I felt the importance of paying attention to overseas situation as I continue my studies.

Finally, I would like to thank the professors and students at the University of Zambia, the people I visited, the professors at Hokkaido University, and everyone involved in IVEP for giving me such a precious opportunity. I'd like to make effort to use this special experience.

Ticks of the genus *amblyomma* (top left)
An engorged tick found on a dog brought to the veterinary hospital (bottom left)
Collecting of ticks in Lusaka National Park (right)

To University of Zambia

Maya KOBAYASHI, 4th year

I will report what I got from the 2022 IVEP program in Zambia.

The most impressive things were the close relationship between humans and animals, and the beauty of the rich nature. I have been interested in infectious diseases. Before going to Zambia, I had learned that in Africa, there were more types of infectious diseases than in Japan and humans lived close to the wildlife, so a new infectious disease would break out more frequently. But Zambia made me realize that I did not "understand", just did repeat the sentences from textbooks. Moving by car, I could see cattle, goats, and chickens crossing roads freely. Going further, there were impalas and baboons. In Zambia, it is dry season in August, so farmers take their livestock to a river where there is grass. And the river is also the source of energy for wildlife, meaning it can be the contact point of livestock and wildlife. During a rainy season, pathogens are diluted because rivers are flowing with plenty of water. However, on the other hand, during a dry season, a pool of water is sometimes contaminated with pathogens in high concentration. There are various types of infection routes, too. For example, anthrax exists in soil as spores. During a dry season, the risk of infection increases because of short grass and its easy contact with soil. In addition, even though some of herbivores do not eat grass on land, they can get infected by eating leaves on which flies with anthrax are. Seeing this society which human life, animals, and environment affect each other, as these examples showed, made me surprise and interest. At the same time, I thought that was very beautiful space with full of energy where humans and animals coexisted. That is because I could learn the environment that was difficult to image in Japan, and the original relationships between animals and nature. From the viewpoints of infectious diseases, I realized that in such an environment, problems related to infectious diseases would more easily appear. An idea had stuck with me that cutting off infection routes was most effective, but I learned it was difficult to adopt in such a society. However, I have been attracted to its beauty of the natural environment, so I would like to find a way to protect the health of people and animals from the hazard of infectious diseases even under such an environment. To be honest, the more I think, the more I realize its complexity, and I do not still come up with a concrete idea. To find a good idea, I will never give up thinking, just continue to study.

Goats resting on the side of the road

I would like to talk about the infectious diseases of companion animals in Zambia. We had an opportunity to see the clinic in University of Zambia. Only in one day, we saw dogs suspected to be infected with parvovirus, canine distemper virus, and also a dog with many fleas and ticks. They were suffering. In Zambia, many dogs are kept outside due to the purpose of security. The information about rabies is well known because the government conducts the campaign for its eradication, but in the present circumstances, the information about other infectious diseases is not known so much. For that reason, in the clinic, veterinarians and students try to explain other risks to owners. I thought there might be some difficulties for the spread of the knowledge due to the differences of the purpose

Paper-plane competition with 6th year veterinary students

compared with the current Japan and the limitation to access to animal hospitals. However, different from wildlife, it is possible to prevent infectious diseases in pet dogs. I hope that the health management of dogs will get better by the spread of its knowledge and vaccinations.

The process of making nshima at the cafeteria

In addition to these learnings and realizations, it was a wonderful experience that I had in different culture and lifestyle in Zambia. For example, Zambian people were very friendly, students who just passed in front of us and workers in the lodge gave us greetings with smiles. I ate nshima, which was the Zambian main food, fish, chicken, and beef with my hand. We saw women wearing very colorful and cool clothes in towns and school. The school of veterinary medicine was closed at 5 pm every day. When we visited a slaughterhouse, a man there who I did not know said to me that he decided to marry me. It was no humid so very comfortable. Everything that I felt with my five senses was new and a very wonderful experience. Today, in the media society, I can get a lot of information about Zambia even stay in Japan. However from media, we cannot feel the humanity generating from the people who have a different way of thinking, and their culture and society. This time, I could feel it and that was really exciting. I would like to visit other countries and have fun to experience the differences.

Four students, including me, took part in this program. Every member shared their knowledge and interest. They tried to understand deeply through their active questions. Every day, those attitudes inspired me and made me act actively to broaden my horizons. Also, they supported me for what I could not understand, and discussed with me what I had questions for. This team working gave me a lot of new, knowledge and viewpoints. I really appreciate my team members' support. Thank you.

For last, I would like to give a big thank you to the all supporters who coordinated this program even under the difficult situation due to the pandemic, university professors who supported us in Zambia and gave interesting lectures to us, also drivers, Embassy of Japan in the Republic of Zambia, JICA, workers in a banana farm, staff of Conservation Lower Zambezi, and the all people who gave cooperation to us. I could gain a lot, not only knowledge but also important realizations and wider perspective. I felt the strength and warmth of the connection between Zambia and Japan, and it was a great honor for me that I could be involved with a part of the connection. Thank you very much. ZIKOMO!

To University of Zambia

Ai KOSHIKAWA, 3rd year

On this visit to Zambia, I took lectures and classes of infectious diseases and wildlife, visited the veterinary clinic, the slaughter shelter, and the national park. Everything was new for me, and I learned more things than I can express in this report. So, I am going to write mainly three things among them.

First is the importance of One Health. I had believed that I understood that concept, but it was not until I spent 2 weeks in Zambia that I realized the significance of zoonosis and livestock-to-wildlife infections. In Zambia, wild animals live freely in about 20 national parks and there are no borders for them. In addition, people live close to them. Most farmers pasture livestock, so I saw goats and cattle moving freely, and sometimes crossing the road in rural villages. Moreover, there were many baboons in some villages. By the lodge of the national park where I stayed, there were many footprints and dung of elephants, and I was able to see a lot of bats at night. I heard that elephants and baboons are especially willing to come up to people for food and there is damage to the crop. I thought this problem is common in Japan, too. In class, I learned that the contact of wild animals and livestock is one of the main causes of the outbreak of infectious diseases. And I also heard that it is difficult to change this way of pasturing because that is a traditional way in Zambia. All humans, livestock, wild animals, and the environment can be causes of infectious diseases. Therefore, I realized the importance of measures with cooperation of different areas and countries.

Second is the difficulty of prevention of infectious diseases. For example, through the lectures on bacteria, I understood that some people are infected with anthrax due to poverty. Because they don't have enough money, they eat the meat of livestock or animals killed by anthrax to get protein. Also, the professor of virology taught us that vaccination against rabies is sometimes refused owing to some myths. For instance, some believe that vaccination makes dogs weak. And then in the slaughter shelter, I was so surprised by the sight. Although the butchering location should be kept clean, not only was sterilization not enough, but also there were a lot of people such as farmers, buyers, and even children. As for anthrax, it seems impossible to prevent infection to humans unless poverty disappears. As to the problem of vaccination against rabies and the slaughter shelter, it is necessary for ordinary citizens to know the accurate knowledge of vaccination and the importance of sanitary management. Those problems are very complicated.

Third is both the wealth and poverty of Zambia. Before this program, I had never been to a foreign country. Thus, this was the first time for me to be exposed to different cultures. I felt that Zambia's wealth is people and nature. Zambian people were always friendly and very kind, too. They listened to my poor English patiently and answered my questions. Moreover, they always greeted me when I went past them in the corridors. In the meeting with 6th-year students of UNZA, they showed us around the campus in detail. Certainly, I was sometimes confused by different ways of thinking, but I felt the warmth of others. The nature was that which I had seen only in pictures. A family of elephants walking leisurely, hippopotamuses raising their heads out of the water, birds whose wings were brilliant, and the star-filled sky. Everything was beyond words. In addition, I was able to see so many elephants and hippopotamuses that I did not believe that they were endangered species. I also learned that the wealth of nature is protected by the effort of a lot of people. I understood that Lusaka National Park, where we visited in the wildlife class, plays different important roles in conservation. This park preserves and treats injured animals and then transfers them to bigger national parks as well as prevents poaching and educates local people about the importance of conservation. I was surprised that there are many ways of capturing animals for transfer, for example, using tranquilizer guns or driving animals into artificial dead ends. I am sure that this field of wildlife is the strong point of veterinary medicine in Zambia. On the other hand, near the university, there is an area called "Kalingalinga", where poor people live. I sometimes was begged by children when I was shopping. In rural areas, I saw people carrying water by buckets on their heads and houses which were not strong enough to protect people from rain or wind.

With students of UNZA school of veterinary medicine


Elephants @Lower Zambezi National Park

Moreover, this program strongly made me realize my lack of English skill. I was able to take very valuable lessons. However, I did not understand some of them. It was bitterly disappointing. My vocabulary was not enough, and I fully realized that knowing the words was different from listening to or using those words in conversation. If I had more vocabulary, I could learn more things. I will never forget this chagrin and I will increase the opportunities of "using" English and make an effort every day so that I can use everything from basic expressions to technical terms.


The lecture of virology

In this program, I came to realize again the importance and difficulty of prevention of infectious diseases. Also, I did not understand the abundance of information I could get until I went outside of Japan. I want to work relating to prevention of infectious diseases, so of course, I will study hard about veterinary medicine and infectious diseases. Besides, I will learn about a lot of things widely by being careful with information of foreign countries.

Finally, I am very grateful to Dr. Ethel and other teachers of UNZA for accepting us and giving interesting classes, students of UNZA for your kindness, and all people concerned with this program for supporting us. Thank you very much.