Malaysian scientists committed to Antarctic research

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Sultan Mizan Zainal Abidin (second from left) listens to Siti Aqlima Ahmad (centre) explain her research project after the opening of the 8th Malaysian International Seminar on Antartica in UPM. PIC BY SAIFULLIZAN TAMADI

CLIMATE change is happening rather alarmingly because of the widespread pollution that has taken place all across the globe for years now.

In a near-pristine area like the Antarctica, accidental oil spills and the use of fossil fuels for daily activities have resulted in a build-up of contaminants which could have detrimental effects on the polar communities and the world at large. Cold temperatures also cause the natural processes that help remove contamination in other parts of the world to happen at a much slower rate.

Dr Siti Aqlima Ahmad, an associate professor at Universiti Putra Malaysia's (UPM) Faculty of Biotechnology and Biomolecular Sciences, has been involved in research to find a solution to the problem since 2004.

One of the activities she has been involved in is the development of a bioreactor for an ex-situ bioremediation of diesel-polluted soil using indigenous Antarctic soil bacteria, which culminates in diesel biodegradation.

"This project will provide extensive knowledge not only on the biodiversity of Antarctic soil bacteria but also, on the potential use of bioreactors and psychrotrophic bacteria in treating hydrocarbon-contaminated sites, especially those with diesel contamination, therefore contributing to the environmental sustainability on climate change," she explained.

The scientist was recently named as one of the recipients of the 2019 Sultan Mizan Antarctic Research Foundation research grants, receiving RM150,000 for her project — the "Second Stage of Bioreactor Design for Cold-adapted Bioremediation of Antarctic Soils Contaminated with Diesel Hydrocarbons".

"This grant will enable me to begin the second phase of research. The last time I applied the bacteria and observed whether the degradation happened, it did, but the period of study that we carried out was only for five weeks.

"This year, we will be going again to carry out more research. I checked earlier this year and the results are encouraging. Eighty per cent of the diesel has degraded, so the research is yielding positive results. Next year, we will rope in our students to get involved in soil experimentation," she said.

Dr Siti Aisah Alias, an associate professor with Universiti Malaya (UM), also received a grant for RM150,000 for her research project on the "Impact of Increasing Rainfall Trend on Atmospheric Reactive Gasses and Microbiota Over the Maritime Antarctic Region".

"Of late, we have observed a heavier rain phenomenon in the Antarctic region compared with 20 years ago. Acid rain occurs not only in temperate and tropical regions, but in the polar region as well, which would affect microbes, bacteria, algae, and fungi — creating an imbalance in the organism population. The organism population is important for decay and to strike a balance in the environment. If the population decresases, it will affect other living things on a higher level," said Siti Aisah, who is also the director of the National Antarctic Research Centre (NARC) in UM.

Siti Aisah has already been on several expeditions to the Antartic region with her colleagues who are doing research on atmospheric science, and the data that they collected is being shared with other researchers from the United Kingdom and the United States.

"We experiment in the lab to study the effects of acid rain on the exposed microbe population. From there we can create models from the physical sciences data," she revealed.

Siti Aisah has been doing Antarctic research since 2000.

"We started with fundamental science research on biodiversity. Then we looked at the effects of climate and temperature changes as well as ultra violet rays on the fungi population. For this next project, we are working with various international institutions coupled with the data obtained from researchers from the United States and the United Kingdom," she divulged.

SEMINAR ON ANTARCTICA

Siti Aqlima and Siti Aisah are two of four recipients of the Sultan Mizan Antarctic Research Foundation Research Grants announced during the eighth Malaysian International Seminar on Antarctica (MISA8) that was held at UPM.

The other two recipients are Dr Wan Mohd Rauhan Wan Hussin of Universiti Malaysia Terengganu (UMT), and Dr Nur Athirah Yusof of Universiti Malaysia Sabah (UMS).

There were also other recipients of the Sultan Mizan Antarctic Research Foundation berth support provided under the Smart Partnership Initiative between the foundation with eight local universities, namely UPM, UM, Universiti Kebangsaan Malaysia (UKM), Universiti Sains Malaysia (USM), UMS, Universiti Teknologi MARA (UiTM) and International Medical University (IMU) and UMT.

MISA8 was graced by the Sultan of Terengganu, Sultan Mizan Zainal Abidin, who also handed out grants and berth support to the recipients.

In his royal address, Sultan Mizan said Malaysia is not only committed to addressing issues of climate change and the protection of Antarctic resources, but has also made progress in terms of science and governance.

"Even here in Malaysia, we are affected by climate change. We are experiencing warmer weather trends along with its impact for the last couple of decades. Such impacts will definitely bring about negative socio-economic changes, including deterioration in economic growth, livelihood opportunities, human health and biodiversity.

Associate Professor Dr. Siti Aisah Alias

Associate Professor Dr. Siti Aqlima Ahmad

"Therefore, there is no other choice but the obligation for every nation to be concerned about the Antarctic continent and the potential aftermath that can occur as a direct result of climatic change. Our climate is the life support that sustains and nurtures us," said Sultan Mizan.

"Malaysia has gone from strength to strength in its scientific endeavours and I must congratulate our scientists from various universities, who have made the country proud through their respective research. I hope the research in Antarctica will also help us with our own country's efforts in addressing climate change," he said.

At the same function, Energy, Science, Technology, Environment and Climate Change deputy minister, Isnaraissah Munirah Majilis, emphasised that Mestecc (Ministry of Energy, Science, Technology, Environment and Climate Change) has always supported Malaysia's involvement in the Antarctic, especially in ensuring proper implementation of the institutional framework.

"In 2012, the Ministry established the Sultan Mizan Antarctic Research Foundation with the mission to sustain Malaysia's presence in polar research and strengthen our capability in the area of global frontier sciences. To date, the foundation has signed a Memorandum of Understanding (MoU) on Smart Partner Initiative on Polar Research with eight local universities to enhance collaboration between parties and strengthen Malaysia's research initiatives in the Antractic," she said.

The Malaysian International Seminar on Antarctica (MISA) is a series of biennial events which gathers researchers from different countries to share their findings and experiences on polar research while providing a platform for scientists to strengthen existing cooperation and forge new collaborations.

MISA also provides opportunities for local researchers and students who are interested in pursuing their career in polar sciences, especially global sciences.