

## A Company from Gifu, the Birthplace of Japanese Modern Beekeeping, Contributing to Increasing Honey Yields in Tanzania



Tanzania in East Africa is an agricultural country where approximately 70% of the population is engaged in agriculture. However, the growth rate of the agricultural sector remains low compared with other sectors, and the disparity between urban and rural areas as well as employment among the younger generation are challenges. The beekeeping industry produces approximately 30,000 tons of honey annually, making the country the second-largest producer in Africa, although the actual yield is reportedly much lower than its potential when considering the climate and abundance of nectar sources (plants from which bees collect nectar to make honey). One of the reasons for this is the use of traditional beekeeping technology by smallholder farmers.

Therefore, Nissin Honey Co., Ltd., which is based in Gifu Prefecture, known as the birthplace of Japanese modern beekeeping, and is engaged in manufacturing and importing honey products, utilizes JICA's SDGs Business Supporting Survey to introduce modern beekeeping in Tanzania.

Japan depends on imports for most of its honey consumption. Nissin Honey, which imports honey mainly from South America, Eastern Europe, and Southeast Asia, began considering Tanzania as an option for diversifying the company's import sources. Mr. KISHINO Hayato, CEO and President of Nissin Honey explains the reason for their choice: "We estimated that, by introducing Japanese modern beekeeping technology, we would be able to increase the honey yield in Tanzania, where honey is collected using traditional methods."

"This project was a new attempt for our company, as it was about not only importing honey, but also developing local human resources and improving production capacity. The issues we addressed first were the introduction of Japanese-style beehive boxes and the aggressive nature of the local bees," says Mr. Kishino, looking back on the early days of the project.

Traditional beekeeping in Tanzania uses beehive boxes that are nearly four times the size of those in Japan and waits for bees to arrive at a fixed location. With this method, it is



A staff member of Nissin Honey Co., Ltd. (on the right) discussing with local beekeeping stakeholders (Photo: Nissin Honey Co., Ltd.)

difficult to move the hives to areas with flowers, and it takes several months to collect enough honey, which reduces its quality. To tackle this issue, Nissin Honey starts this project by introducing compact and mobile Japanese-style beehive boxes. In order to ensure a stable supply of beehive boxes, Nissin Honey plans to set up a system to manufacture and distribute beehive boxes using local wood, in cooperation with a company in Miyazaki Prefecture in Japan. Mr. Kishino says, "The introduction of compact beehive boxes enables the local people to move the hives to areas with flowers and collect honey efficiently. In addition, smaller beehive boxes are easier for women to handle, which encourages women's participation," as the explanation of the benefits of Japanese-style beehives.

Regarding another challenge of the aggressive nature of African honeybees, it poses a high risk of beekeepers being stung while working. Therefore, Nissin Honey, with the cooperation of JICA, works with local universities and research institutes to increase the number of bees suitable for beekeeping by placing honeybees in an environment where they do not need to be aggressive, repeating crossbreeding for three generations, and selecting less aggressive bees.

According to Nissin Honey, it has been confirmed that the yield can be increased to nearly four times that of traditional beekeeping by incorporating modern beekeeping technology. Local beekeepers, who were initially skeptical about the introduction of new technology, have come to have high expectations for the introduction of Japanese beekeeping technology. Regarding the company's future prospects in Tanzania, Mr. Kishino says, "Our goal is to further increase production and stabilize the business by 2026, and we have to work not only on human resources development of beekeepers for increasing the production, but also on quality issues, including taste and color. We aim to resolve these issues and deliver honey from Tanzania to Japanese dining tables while increasing and stabilizing the income of Tanzanian beekeepers."



Checking that the bees have adapted themselves to the beekeeping equipment brought in from Japan (Photo: Nissin Honey Co., Ltd.)

## Waste Management in Ethiopia Improved with Landfill Technology from Fukuoka – Working with Local People –



In Ethiopia, the amount of garbage has increased in recent years due to the rapid urban population growth and changing lifestyles, but the development of solid waste disposal facilities has not kept pace, making waste management a major issue. Notably, the Koshe dump site, Ethiopia's largest dump site for garbage in Addis Ababa, the capital city of the country, was in urgent need of finding a solution after an accident in 2017 when the garbage that had been piled up to a height of 50 meters collapsed and more than 200 people lost their lives.

In response to this accident, in 2018, through the United Nations Human Settlements Programme (UN-Habitat), Japan provided emergency technical support to improve the Koshe dump site, by implementing the "Fukuoka Method," a Japanese landfill technology with a proven track record in solid waste management.

The "semi-aerobic landfill type" is a landfill technology known as the "Fukuoka Method," which is an environmentally conscious landfill technology originally designed in Japan. It was jointly developed by Fukuoka City and Fukuoka University in Japan in the 1970s, and was devised and put into practice by Professors Emeritus Dr. HANASHIMA Masataka and Dr. MATSUFUJI Yasushi at Fukuoka University. This technology facilitates the inflow of outside air via leachate collection pipes installed at the bottom of the landfill so that the decomposition of landfilled waste is accelerated by activating microorganisms in the waste layer. This technology also purifies leachate and inhibits the emission of methane gas, one of the greenhouse gases. Another feature is that it can be introduced at a low cost by using local materials such as bamboo and oil drums.

Dr. Matsufuji speaks from his own experience that to introduce the Fukuoka Method in landfills where there is neither heavy machinery nor tools available, and where there are people who make their living by picking up waste (waste pickers), just passing on the technology will not work.



Three Japanese experts who gave on-site technical assistance and the waste pickers who worked together with them (Third from the left (back row): Professor Emeritus Matsufuji) (Photo: UN-Habitat)

Therefore, Dr. Matsufuji himself visits the dump site facilities and provides technical assistance to introduce the method while gaining the cooperation of waste pickers. "Waste pickers, who are frowned upon by the public, are our partners who contribute to the separation and reduction of waste, if you look at them from another perspective. Through the cooperation of waste pickers, the introduction of the Fukuoka Method will be accelerated. At the same time, it makes the dump site safer and their work easier. As we work together and improve the dump site, they become gentler and more cooperative," he says.

Following its success in Addis Ababa, calls for the introduction of waste management through the Fukuoka Method increased, not only from within Ethiopia but also from 21 other countries. In Ethiopia, a project was started in Bahir Dar City in 2019 and also in Hawassa City since 2021 as part of the "African Clean Cities Platform (ACCP)"\*1 initiative.

Dr. Matsufuji receives requests for cooperation in improving landfill facilities from many countries. Regarding the future expansion of the method to other countries, he says, "There are dozens of landfill facilities in a single country, and the budget is limited. Since it is difficult for me to visit every facility myself, I would like to focus more on developing human resources who can convey the correct techniques and knowledge, hoping to widely spread the Fukuoka Method." Currently, plans are underway under Dr. Matsufuji's leadership to establish regional training centers that will utilize both onsite and online training in areas such as Southeast Asia, South America, and Africa. It is hoped that Japanese technology will lead to improvements in sanitary landfill facilities in these regions.



The Koshe dump site in Addis Ababa improved using the Fukuoka Method (Photo: UN-Habitat)

\*1 See the glossary on page 67.



## Contributing to Malaysia's Palm Oil Industry with Technology from Japanese Small and Medium-Sized Enterprises (SMEs)



Malaysia is a major producer of palm oil, which is extracted from oil palm fruits, and its exports amount up to approximately ¥2 trillion. However, the problem of processing agricultural waste, such as oil palm trunks (OPT), which are produced when cutting down old palms, as well as oil palm fronds and empty fruit bunches, has become an issue for which a balance between development and environmental protection is required. Oil palm trees are logged and replanted approximately every 25 years to maintain oil production levels. Consequently, as many as 75 million old oil palm trees are cut down every year. Abandoned OPT on the plantation sites not only emits greenhouse gases, including methane gas, but also causes the spread of soil-borne diseases, making it difficult to reuse the land in some cases.



Trunks of old oil palm trees logged and piled up in an oil palm plantation (Photo: KOSUGI Akihiko)

In response to this situation, the Japan International Research Center for Agricultural Sciences (JIRCAS) implements the "Project on Sustainable Replantation of Oil Palm by Adding Value to Oil Palm Trunk through Scientific and Technological Innovation" from 2019 as part of the Science and Technology Research Partnership for Sustainable Development (SATREPS)\*1 in collaboration with the University of Science, Malaysia (USM). This project conducts scientific and economic assessments of the negative impact of abandoning OPT after logging. It also examines ways to maintain the healthy state of palm plantations by upcycling OPT without abandoning them on site, and to sustain palm plantations without expanding their acreage. To this end, JIRCAS and USM work to develop technology for manufacturing high-value-added products from OPT and to demonstrate its effectiveness, as important targets.

Project leader Dr. KOSUGI Akihiko, who has been conducting research on the utilization of OPT waste at JIRCAS since 2004, talks about the achievements of this project as follows. "We presented our research findings on the impact of OPT abandonment on soil to the Government of Malaysia and plantation owners, which helped them understand the benefits of removing waste from the plantation sites. The use of palm biomass is increasing both in Japan and overseas by turning collected waste materials into useful products such as fuel pellets, plywood, and fertilizer. For example, Panasonic Corporation developed a technology called "PALM LOOP" that makes upcycled wooden boards from oil palm waste. Thanks to this technology, the waste wood can now be used

as a material for furniture. By implementing research results in the real world, we aim to add value to OPT as a resource and create new industries."

In a pilot project to commercialize OPT, the knowledge of Japanese engineers and the technical skills of local factories in Japan were utilized to develop a "Multi Biomass Treatment Process" that reduces the environmental impact of pellet manufacturing. This process can pelletize not only OPT waste but also its branches and fronds, as well as empty fruit bunches discharged from palm oil factories. The project intends to achieve carbon neutrality in the palm oil industry by disseminating this process in the future. In addition, it reaches out to the agencies of the Government of Malaysia to certify not only palm oil but also the biomass produced by the palm oil industry as a sustainable product.

Dr. Kosugi aims to collaborate with Japanese companies to realize the social implementation of the palm biomass project, including this OPT waste material: "Since this series of results was achieved by combining the brilliant and superior technology of Japanese SMEs concentrated in downtown areas called Shitamachi, we named it the 'Shitamachi Biomass' initiative. We hope to apply this concept to the export industry not just in Malaysia but also in the entire Southeast Asian region, utilizing Japanese technology for the world while also revitalizing Japanese manufacturing itself."

Dr. Kosugi launched a venture company in 2022 in view of continuing the project after its conclusion in the SATREPS framework. "The shortest way for the social implementation of the technology we have developed is to create our own way for its use. For the people of Malaysia, it is important to ensure profitability first, but on top of that, it is important to raise environmental awareness. We would like to continue working to expand the biomass business in Malaysia by achieving both the stabilization of the procurement of raw materials and commercial viability of the factory, which will lead to sustainable land use and environmental conservation," says Dr. Kosugi about his future prospects.



Dr. Kosugi (seventh from the right) and students engaging in the research in front of the SATREPS Oil Palm Trunk Research Laboratory launched at USM (Photo: KOSUGI Akihiko)

\*1 See the glossary on page 38.

## Japanese Company's Effort to Disseminate Cultivation and Processing Techniques for "Washi" Paper Raw Material "Mitsumata" (Oriental Paperbush) in Its Country of Origin, Nepal



Approximately 80% of the land in Nepal is mountainous, and combined with its geographical constraints as a landlocked country, basic infrastructure is not adequately developed. Agriculture is a major industry in which 60% of the population is engaged, but productivity is low due to a lack of infrastructure and production technology, which is a major cause of poverty in rural areas.

Kanpou Inc. is a Japanese company based in Osaka and engaged in the sale of government publications as well as Mitsumata (*Edgeworthia Chrysantha*, commonly known as Paperbush and called Argeli in Nepal), a raw material for Japanese traditional paper called "washi." Faced with this situation in Nepal, the company utilizes JICA SDGs Business Supporting Surveys and transfers technology for the cultivation and processing of Mitsumata in Nepal, aiming to revitalize Nepal's agriculture and forestry industries and resolve the development challenges.

In Japan, Mitsumata is used as part of the raw material for banknotes since the Meiji era, but domestic production has been decreasing year by year. Kanpou's first involvement with Nepal was through its corporate social responsibility activity to donate wells, and in 1990, the company began conducting research on Mitsumata in Nepal, where the plant originated. With the aim of revitalizing villages in areas where Mitsumata grows wild, Kanpou started teaching cultivation and processing techniques, and replanting Mitsumata in areas cleared for forest conservation. It then established a local subsidiary and trained Nepali staff, through whom it continued providing technical assistance to contracted farmers.



Staff of Kanpou-Nepal giving work instructions to village women (Photo: Kanpou Inc.)

Mr. MATSUBARA Tadashi, the company's President and CEO who took over the Mitsumata business in Nepal in 2013, looks back on the earlier days of the project and says, "I will never forget the words of a village elder who said, 'Thanks to Mitsumata, children in our village are no longer trafficked due to poverty. I myself was able to raise my daughter to become a respectable person.' When I heard these words, I vowed that I would surely get this project off the ground and eliminate poverty."

While considering how to continue this business, Kanpou consulted the Embassy of Japan in Nepal, which then referred the company to a JICA project. In 2016, the company began the SDGs Business Model Formulation Survey with the Private Sector to study its feasibility, and since 2019, it implements the "Pilot Project for Establishment of Dissemination Model of High-Quality Mitsumata (Argeli) Production in Nepal."

Talking about the advantage of utilizing JICA's public-private



Mr. Matsubara (on the left) holding a meeting with producers (Photo: Kanpou Inc.)

partnership support scheme, Mr. Matsubara says, "Poor landless farmers grow Mitsumata on state-owned land with permission from the government. Previously there were many obstacles to continuing their business, such as by having to apply for permission every time the government changed. However, after starting as a JICA project, the permit and approval process was expedited thanks to the network and trust that JICA has cultivated in Nepal. Moreover, we were able to expand the geographical coverage of our activities to regions far away from the capital. Currently, we produce approximately 150 tons of Mitsumata per year at approximately 30 production sites, which is approximately three times the amount produced 10 years ago." Mitsumata from Nepal is imported to Japan and becomes the raw material for banknotes manufactured by the National Printing Bureau.

This project creates employment opportunities and contributes to women's participation in society. Regarding the results of the project, Mr. Matsubara explains, "Mitsumata processing does not require large facilities or electric power and can also be easily carried out by women, so it can create jobs for the entire village, encouraging social participation of women. This project also provides employment opportunities to migrant workers who returned home from the capital due to the spread of COVID-19. In addition, it has led to the autonomous operation of the village, as the villagers began to utilize profits from the Mitsumata business for the village, such as for building a school."



Flowering Mitsumata shrub with the Himalayas in the background (Photo: Kanpou Inc.)

In order to create new jobs and further revitalize the agriculture and forestry industries in Nepal, Kanpou intends to make Mitsumata a specialty of Nepal and considers using the network cultivated through the Mitsumata business to develop new agricultural products. It is expected that this will further create employment for people living in the mountainous regions of Nepal and lead to poverty reduction.