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Connecting people, agriculture and the environment through appropriate technologies

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My relationship with Pakistan
"A Departure Point for the World of International Cooperation"

I joined AAI in February, 2019, and have been working in Islamabad, the capital of Pakistan, as a member of a JICA technical cooperation project since March. Pakistan was the place that opened my eyes to the world of international cooperation. I am still in my first year as a consultant, but I would like to contribute to the people of this country in some way, and as this is my first time to write for AAI News (and my first project is in Pakistan), I would like to briefly introduce myself by retracing my first steps to where I am now.

When I was a university student, I traveled from China to Pakistan for a month. At that time, Pakistan was in a period of security instability, with bombings targeting war materials in the area around the Khyber Pass and terrorism in urban areas such as Lahore and Karachi. However, I could travel safely with the support of local people as my appearance made me look like a shoestring backpacker. Also, since it was during Ramadan, I was able to experience the special atmosphere of this holy period; the city was silent with no restaurants open during the daytime, and after sunset, I had the opportunity to jump into groups on the street who had started eating their "Iftar" meals.

Although some of the areas were insecure and dangerous, for me, encountering the local people and their lifestyles was a serendipty that gave me the opportunity to foster my curiosity and interest in the distinctive character of this Islamic culture and society. From this experience, I realized that I desired to work in these areas in the future. In order to achieve this desire, I was made aware of the necessity to acquire more specialized knowledge and skills; thus, I began to study development economics, rural development and Arabic.

A scene after breaking fast

Badshahi Mosque in Lahore

After completing an undergraduate degree programme in Japan, I entered a trading company with the expectation that I might be able to go to Islamic countries. However, my assignments were mainly domestic midstream and downstream logistics operations in the manufacturing industry, which didn't satisfy my interest, as I had originally wanted to work closely with local communities. This sense made me realize that I wanted to take on a new challenge, and I applied for the Japan Overseas Cooperation Volunteers (JOCV). As a result, I was dispatched to Sudan as a member of the Community Development Corps, and worked on activities to improve livelihoods, such as food processing in rural areas. After completing my term as a volunteer, I pursued rural development studies in a post graduate degree programme in the UK to make up for my lack of skills and knowledge. Then, I was fortunately given the opportunity to take a new step in the world of international cooperation as a member of AAI.

My main specialied areas are agricultural economics, rural livelihood improvement, and social analysis, which is a bit different from other AAI members who specialize in agricultural production and environmental conservation technology. However, I believe that I have tried to grasp the situation and needs of the field from a different standpoint based on my specialty and experience by being a member of AAI. In conclusion I hope to contribute to the outcomes of technical cooperation as much as possible. Perhaps it was fate that my starting point on this road to working in Pakistan with AAI also began in Pakistan. Although there are many new things for me to work on in Pakistan, I am very much looking forwards to what kind of new starting point it will prove to be for me.

(Kenji Nakamura, July 2019)

Ingenuity of demonstration fields <Part 4>

Demonstration field with a story

I feel that an exhibition in a museum springs from a certain hypothesis and its ingenuity lies in the way it elaborates upon and reveals its story. In its way the demonstration field can be seen in similar terms - it is an exhibition and the entire village in which it stands is the museum. It is interesting to think three-dimensionally about the connection and development of technology, in holistic terms just like my hypothetical picture.

It seems that there is some debate about how to effectively display thinking and concepts in a demonstration field. I have been thinking for many years about how it can be displayed as a continuous exhibition with an interesting story following a constantly developing line, as opposed to just a technical display caught in one moment. Here, I would like to introduce an exhibition connected by a line, using a trial in a JICA technical cooperation project being implemented in the state of River Nile, Sudan (hereinafter referred to as the “RN project”).

The state of River Nile is located about 250 km north of Khartoum, the capital. It belongs to a typical desert climate zone and has an average annual rainfall of 100 mm or less, making it extremely difficult to establish dry farming. This said, it is a “Gift of the Nile” and irrigated agriculture is actively carried out along the river. However, the heat of the summer (May-August) here is severe, and the air temperature during the day is well above 45 degrees Celsius. In such an environment, the cropping system has to be centered on winter crops, which thrive in the relatively mild temperatures from November to February, and we have not actively worked on summer cropping. The dormant period of such crops is locally called the Dead Season, and it can be said that it is harsh.

The RN project was aimed at introduction and promotion of highly cashable summer crops using irrigated agriculture. Rice, maize for feedstuff, pigeon pea and strawberry were examined as candidate crops, but finally oil yielding crops such as sesame, peanut and sunflower, which had yielded research results in Agricultural Research Cooperation (ARC), were selected as the items to be introduced.

As an introduction of new crops, the exhibition of cultivation techniques such as plowing, sowing, fertilization, and pesticide spraying, squeezing of oil crops, and the process of selling in the village market were exhibited. I tried to convey a series of flows from upstream to downstream as a market-oriented message. Specifically, following the demonstration field of oil crops, all work processes such as the use of agricultural machinery, small-scale processing plants for peeling and oil extraction, food preparation by women's groups, storage, and buying and selling in the market are continuously exhibited.

In the above-mentioned "Connected Exhibitions", we devised an exhibition order that naturally raises curiosity according to the changes in the interests of farmers. Farmers were particularly intrigued by the so-called market-in, which is how to sell what they make. From this launch pad the exhibition introduces methods with new technologies, ideas. It has been well received by farmers who praise it for being easy to understand. One farmer told the exhibition story and his happy conclusion as he reached the end of the story line was, "The season of death is over."

The introduction of cashable summer crops not only increased the acreage of oil crops, but also led to the construction of new small-scale processing facilities by farmer’s groups. I think that the exhibition equipment, which emphasizes the flow of composition, connection and line was a dynamic and interesting attempt, and carries with it a sense of expandability and anticipation.

Harvesting oil crops

Oil extraction

Oil extracted products from groundnuts

Explore the world of beekeeping <Part 4>

Visiting Ishizuka Bee Farm (1)

In June 2019, we had the opportunity to visit Ishizuka Bee farm in Miyagi Prefecture. As an example of Japanese beekeeping, we will report on its activities in this issue and the next.

Ishizuka Bee farm was established in 1997 by Takeo Ishizuka in Koya district of Marumori Town in the southern part of Miyagi Prefecture. Mr. Ishizuka, from Chiba Prefecture, became a disciple of a beekeeper in Kagoshima Prefecture after graduating from university, and subsequently became independent after developing his skills under his master for about two years. The main reason for choosing Marumori Town was that there were few beekeepers around, so there was little competition for bee forage.

An apiary at Ishizuka Bee Farm

Currently, Mr. Ishizuka manages about 200 colonies of honeybees with three staff members; one beekeeping staff, one sales staff and one staff general affairs manager. According to statistics, the average number of bee colonies per Japanese beekeeper in 2018 was 22.2 colonies, but if you were a full-time beekeeper, you needed more than 100 colonies. Many beekeepers in Japan migrate seasonally from south to north in the Japanese archipelago to find nectar-producing plants, but in the Tohoku region, many beekeepers do not move their bases, and Ishizuka Bee farm also follows this pattern. Although they do not move their base, they have 10 apiaries nearby and collect nectar while moving the hives to the next apiary in about 1-2 weeks according to the flowering period of the nectar source.

As shown in the table, nectar collection starts from rape and apple blossoms that start to bloom in late April, followed by horse chestnuts and black locusts in late May. Mid-June is the peak of the bee farm nectar harvest. After the peak season, the source of nectar decreases, but they continue to collect nectar from persimmons in late June, chestnuts in early July, and wildflowers on the banks of the Abukuma river from late August. Then, from late November to mid-April, they move their beehives to Kashiwa City, Chiba Prefecture to overwinter.

Location and timing of nectar collection and beehive rental for pollination at Ishizuka Bee Farm

Activity	Location	Nectar plant	Number of colonies	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Nectar collection	Kashiwa city, Chiba pref.	Cherry	200					*No honey extraction							
	Marumori town and nearby area	Cherry	200					*A few honey extraction							
		Rape	20												
		Black locust	100												
		House chestnut	100												
		persimmon	200												
		Chestnut	200												
	Akita pref.	Apple	100						*Same colonies with colonies for the rental for						
	The bank of Abukuma River, Marumori town	Wildflowers	100												
Rental for pollination	Miyagi pref.	Strawberry	100												
	Akita pref.	Apple	100												
Overwinter	Kashiwa city, Chiba pref.		150												
	Marumori town and nearby area		50												

In addition to honey production, another important source of income is the lending of bee colonies for pollination to horticultural farmers. Unlike honey production, which fluctuates from year to year, pollination services provide a stable income, which is important for management. Approximately 100 colonies will be rented to strawberry farmers in Miyagi prefecture and apple farmers in Akita prefecture through agricultural cooperatives. Nectar cannot be expected from beekeeping at strawberry farms, but it is a valuable source of income in the winter when there are no flowers. At apple farms, by contrast, honeybees collect nectar at the same time as pollination during the rental period of about 10 days, so, it also contributes to honey production.

Their annual honey yield is about 5 tons. In general, full-time beekeepers produce a few items in large quantities and sell them to wholesalers, but Ishizuka Bee Farm produces about eight types of honey and sells them at roadside stations, farmers markets, inns and hotels. Currently, they also manufacture ice cream and beeswax candles, but in the future, they would like to work on high-value-added products such as hand cream, soap, and waffles that use honey. Since there is still demand for honey, they are considering increasing the number of bee colonies, and they would like to rent forest lands to plant and manage horse chestnut and black locusts as nectar sources, and increase the scale of production.

In the next issue, we will report on the technical aspects of beekeeping and the activities of the Zambian trainee at Ishizuka Bee farm.

Facts about dry land vegetation <Part 7>

Apple of Sodom

I have chosen the "Apple of Sodom" as the 7th topic for this series. This plant was already introduced in the early AAI News No. 5 (1996) "Plants in Arid Lands and Their Utilization". The scientific name is "*Calotropis procera*", and is very common in the United Arab Emirates at the lowlands between dunes and along wadi. In the arid areas of the Arabian Peninsula, it is considered to be an indicator plant in places where there are relatively favorable water conditions. This plant is also listed as one of the invasive vegetation species and is also an indicator of over-cultivation. In fact, this plant was conspicuous in places like abandoned formerly cultivated land in the desert.

Habitat/ Environment

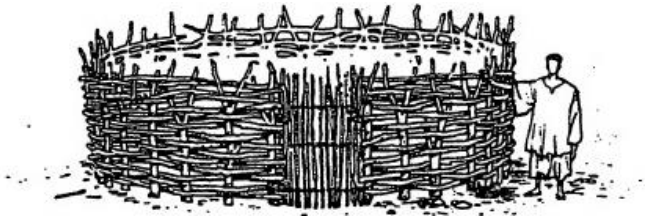
Flowers of the plant

While I was working in Dubai, at the time I was guiding researchers from Japan, I was told that this plant had the name "Apple of Sodom" or "Dead Sea Milkweed". Sodom is a town on the Dead Sea coast that appears in the Old Testament book “Genesis” and is said to be a town of immorality that was destroyed by the judgment of Yahweh. From this town and the name of the apple, which imitates ‘the forbidden fruit’, it seems this name is used for some plants that bear toxic fruits. One of them is *Solanum mammosum*, which appears in the TV drama "Apple of Sodom - Daughters Who Killed Lot".

This plant is widely distributed in Oman, especially in the Dhofar region, and is often found in wastelands along the roads around urban areas and villages. In addition, this plant is explained in detail in the book "Plants of Dhofar" published in 1988, along with the illustrations shown on the right. According to the description, the sticky emulsion-like figs that it exudes when the trunk and branches are damaged is highly toxic and is used as a material for poisoned arrows and, interestingly at the same time is applied as a medicine for livestock skin diseases. Furthermore, there is an account that states charcoal made from the stem of this plant can be used as a raw material for gunpowder.

Morphology of the plant

Even in the area around Lake Fagibinne in Mali, where the non-profit organization "Association Sahel" was initially active, the growth of this plant was commonly observed in places where water conditions are likely to be good, such as old lake bottoms and depressions in sand dunes. It is called "Torsha" in this area, but it seems that it is only partially used because the material is weak and the emulsion is toxic. Meanwhile, the project used this plant as an unutilized resource for various purposes. For example, the trunk of Torsha was used as a material for the hedges surrounding the nursery to protect the seedlings from strong winds. Since it was knitted into a circle as shown in the figure below, it was strong and had no corners, so it was less likely to break. Attempts were also made to introduce the use of the plant’s fiber and fluff to women's independence support projects.



This plant is less important to the inhabitants of the Arabian Peninsula and West Africa. In fact, because it is not very useful, it can be considered that it survives even in arid areas where resources are scarce, without suffering from collection pressure. However, as mentioned above, there are some use cases, and it may have some great value that has not been identified yet. When I see this plant, I think of the Daijoa idea that is summarized in one word meaning "The usefulness of the useless".