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The sun in Uganda (1)

About 10 years have passed since I started working on rice cultivation in Uganda. Here are some stories related to the sun in an equatorial country based on what I have observed.

Time difference between standard time and actual sun movement

When I first arrived on my assignment in Uganda in March 2007, I woke up a little early due to jet lag and was relaxing. After a while, the dawn was over and I thought it was around 6:00am, but the time had already passed 7:00am and I was panicked. Uganda's territory is in the range of 29° to 35°E, but the meridian of Uganda's standard time, UTC+3-hours, is 45°E, which is in the far east of the territory. For this reason, the local solar noon in Kampala is later than noon at the standard time, and the sunrise is also later. The meridian 30°E, the standard of UTC+2-hours passes through the western edge of Uganda's territory, so if UTC+2-hours is standard time, I think it fits well with the rhythm of everyday life, but for locals, this may not be a big deal. And having no time difference with East African neighbors would be economically beneficial.

Japanese often start lunch around noon, but the peak hour of lunch time of Ugandan restaurants is after 13:00. It seems to me that Ugandan people are having lunch at the local solar noon time instead of at noon, standard time. I'm wondering about why human appetite is stimulated by the midday sun.

Seasonal changes in sunrise and sunset time

In Uganda, nightfall becomes earlier and earlier from October to December. As in Japan, I felt that the days were getting shorter toward the winter solstice. One day, when I left the office, watching the sunset, I told my Ugandan colleague, "The sunset is getting early, these days." I was surprised by his answer, "Yes, and the dawn is also early." He was right. The day length was not getting shorter.

As shown in the figure below, the sunrise and sunset times in Kampala move earlier or later twice a year while maintaining the day length. The difference between the earliest and latest times is 31 minutes. This is related to the orbiting of the earth while rotating, and it is a phenomenon that can be observed as a time lag of the local solar noon in Japan, but the change in day length is larger due to the high latitude of Japan. It cannot be recognized as a change in sunset time. It is a phenomenon that can be observed only under the equator where there is no difference in day length. Given these phenomena, I'm interested in whether the flowering time of rice in Uganda fluctuates seasonally within a range of 30 minutes or not. However, it is difficult to confirm this seasonal change because the flowering time of rice changes for more than one hour depending on whether it is sunny or cloudy.

If a Japanese watches the sunset every day around October in Uganda, he may feel that winter has come, but if he walks early in the morning, he may feel signs of spring.

	Sunrise	Sunset	Solar noon	Day length
Max	7:01	19:07	13:04	12:08
Min	6:30	18:36	12:33	12:06
Diff.	0:31	0:31	0:31	0:02

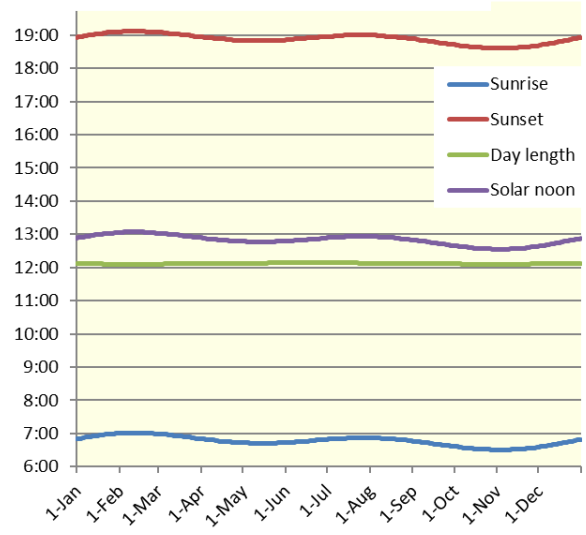

Fig. Sunrise time, sunset time, local solar noon time and day length in Kampala

Ingenuity of demonstration fields <Part 1>

Advantage and misunderstanding of demonstration fields

In order to disseminate useful technologies to farmers, various extension methods have been studied and practiced. Demonstration fields are often used as an effective tool. Indeed, one could say it is an indispensable tool when disseminating cultivation techniques whose performance is affected by the natural environment of specific areas.

Demonstration fields have two main roles: "verification of the adaptability of the technology to the local natural and social environments" and "promotion of the usefulness of the technology for getting the farmers to know its application in the target area". Farmers are generally said to be skeptical of new technologies and conservatively attached to traditional methods. However, given the risks that farmers must take when adopting new technologies, it is inevitable that they should feel cautious. For such farmers, demonstration fields where they can confirm the applicability and usefulness of the new technology with their own eyes, are the most convincing tool. It is exactly a case of "Seeing is believing." In addition, when farmers set up a field by practicing new technologies by themselves, the demonstration field can also be a “place for technology transfer”. From this point of view, there is no doubt that demonstration fields are an excellent tool for technology dissemination.

Demonstration fields are being used around the world as a useful extension. This said there is also the idea that "if a demonstration field is showing good results, the farmers will automatically embrace the methodology." The most typical example is the case where an advanced farmer in an area is selected as a model, and financial resources are imported from outside to set up a demonstration field. Cultivation in these "special" demonstration fields is likely to be successful, but the technologies are unlikely to extend to nearby farmers. Rather, even negative effects can be seen that widen the inequality among the community members and encourage other farmers to give up and be jealous. Therefore, locations and model farmers for demonstration fields should not be limited to special case scenarios and external financial inputs should be minimized.

It is also important to verify in advance that the technology itself is useful and applicable to target farmers. In particular, when introducing horticultural crops or irrigation technology, these technologies will not extend to farmers unless it is verified that the cost of the technology can be covered by local farmers.

How to show the field is also important. I saw one demonstration field designed to introduce a new variety. However, since there was no comparative variety, it did not allow visitors to evaluate accurately the superiority of that variety. In another case, I visited a demonstration field introducing a new technique. The field was composed from many plots randomly arranged with multiple treatments. Although I could observe some growth differences between the plots, it was not easy to clearly evaluate at a glance which treatment caused the differences. It was like an experimental field, not a demonstration field. The design of demonstration fields should be simple, keeping in mind that the purpose of a demonstration field is mainly for extension and communication to visitors.

The selection of installation conditions of demonstration fields, the validity of technology, and the field design described above are basic matters. More importantly, depending on the purpose of demonstration field and local conditions, it is necessary to plan the content and operation of the field and use it as a dissemination tool. We, AAI, have set up many demonstration fields in our work on agricultural sectors in developing countries and in this series, we will introduce some ingenious ideas for demonstration fields that we have developed for technology dissemination.

A demonstration field to show the effects of fertilizer and to promote its use. The field was designed to be easily understood visually.

Explore the world of beekeeping <Part 1>

Introduction

Beekeeping is a traditional form of agriculture that has been practiced by humankind since ancient times. Apparently, a kind of beekeeping has been depicted in a mural, which was created 10,000 years ago, found in a Spanish cave. Apiary has been practiced in ancient times in Egypt, Greece, India, and China. Even though beekeeping seems to be categorized as a livestock activity because it manages living bees to harvest honey and beeswax, it has very different characteristics from other agricultural activities such as livestock breeding and farming rice or vegetables.

Bees collect pollen and nectar within a few kilometers of their nest, regardless of whether flowers are wild or cultivated. Therefore, beekeeping can be started wherever there is the minimum space required for placing a beekeeping box or a beehive. Furthermore, the land does not need be flat, another significant difference from other agricultural activities such as crop cultivation, in which production amount and work efficiency increase as farmland becomes larger and more accessible. Honey is also a major non-timber forest product and has traditionally been practiced by people living in forested areas as an activity utilizing forest resources. For these reasons, beekeeping can be a small and easy-to-start income generation activity for smallholders, women's groups and those who do not possess farmland.

A beekeeper starting to practice beekeeping using a modern method

Honeybees are also important actors as pollinators. For production of apples, plums, and strawberries, honeybees can be used for pollination. To take one example during strawberry cultivation using greenhouses in Japan, it is common to purchase honeybees and pollinate during the flowering period. Some beekeeping farmers specialize in renting bee boxes as a business. Even for beekeeping in the field, the pollen and nectar collected by honeybees are unused resources that are not utilized for other agricultural activities. Therefore, beekeeping can coexist without competing with other agricultural activities. In addition, honeybees are closely related to the natural environment such as the pollinated flowers and forests in which they exist. So, it would be possible to raise awareness and knowledge of people on environmental protection through beekeeping activities. Even though beekeeping, by itself, can be a business, it is a very multifaceted agricultural activity which is closely related to horticultural crop production and forest ecosystems.

On the other hand, some challenges are observed in traditional beekeeping practices in forest areas in Asia and Africa. In the case of traditional beekeeping in an area of Ethiopia, beehives formed like wooden barrels are tied to tree branches waiting for a queen to naturally enter the beehives and build a nest. Then, the beehives, mostly made of native tree bark, will be used only once and destroyed when honey is harvested. Destroying beehives in this way places a burden on forest resources and the honey productivity is very low compared with modern beehives. Besides that, these traditional practices are very risky since workers have to climb up and down tall trees holding wooden beehives. There is also a danger of wildfire due to careless handling of the smokers used to manipulate honeybees by calming them down.

This series focuses on beekeeping methods in various places for both traditional beekeeping, which is still practiced in eastern Africa, and modern methods using beekeeping boxes.

Traditional beehives hung on native trees

AAI and Me – Yoshihisa Zaitsu <Part-1>

Encounter with AAI

I left AAI (Appropriate Agriculture International Co., Ltd.) in June 2016, after some 27 years working with AAI members and taking part in international cooperation activities in the field of agriculture. I am currently working to contribute to the local community in my hometown in Miyazaki and taking advantage of this retirement opportunity I am ready to deliver several articles looking back on my activities at AAI.

My first encounter with AAI began in 1978 when I met the current president, Hiroyasu Onuma, in the UAE. After graduating from university, I had been dispatched as a laboratory technician to the Agricultural Research Station in Abu Dhabi after an introduction by my professor, the late Dr. Keiichiro Matsuda of Shizuoka University. The station was operated by the Desert Development Institute Japan (DDIJ) which was the related organization of Ministry of International Trade and Industry (MITI) and was established in the desert between Abu Dhabi and Al Ain. Onuma was working in the station as an expert at that time. Since this was my first overseas assignment and I was not good at English, Onuma educated me through on-site activities. By watching Onuma who had an uncompromising attitude to field experiment protocol while always trying to work with fun and good humour with Pakistani laborers and Palestinian technical staff, I was drawn into that attitude when I carried out my daily work. I found out that there was such a profession as an international development consultant providing overseas agricultural support, and this led to the definition of my future occupation.

I resumed college life after returning to Japan. After completing my master's course, I was looking for a job as an international development consultant. I finally got a job at CKC (Chuo Kaihatsu Corporation) and I was always blessed in terms of work. Overseas assignments came in without interruption for me even though I was a newcomer. I was able to gain knowledge and experience in various fields from competent seniors. I also participated in academic conferences and training almost at will. My knowledge and practice accumulated not only in the fields of soil and land use that I specialized in, but also on agriculture in general, including crops, irrigation, farm economy, and satellite image analysis. This greatly contributed to my consulting work in the agricultural field. I was well satisfied with the professional work in this way, but I was hoping to work as a long-term expert in the way I had experienced in Abu Dhabi and the idea gradually became stronger. However, it was not possible to find long-term dispatch opportunities in my specialization field at that time in CKC.

At this time, Onuma who had returned from Dubai requested me to join in resuming activities at the dormant AAI. The decision to shift my job to AAI came quite easily, despite being quite a gamble for me just after getting married. However, I remember that it took about two years to actually make a move. There were long negotiations between CKC and AAI. I wanted to move to AAI, but CKC was expanding its scale and tried to incorporate AAI. Despite these twists and turns, Onuma and I started AAI activities in the year 1989.

We borrowed and shared a desk in the office of FAI (Fisheries and Aquaculture International Co., Ltd.), a company with which we had a close relationship. Since it was not convenient, we soon rented an office on Hiranuma shopping street in Yokohama and tried to make our activities full-scale. AAI did not have the appearance of a company and there was only one long desk in the office. My first work after joining the company involved attending to the actual practical details of joining a company; organizing AAI's pension participation procedure, sending letters of thanks for starting activities to affiliated companies and so on.

However, performing various tasks at the startup period of the company was a time that generated a strong awareness of, and passion for, running our company. Everything had to be decided and executed by just the two of us. Taking all the responsibility on ourselves gave me a full sense and awareness of "running AAI". The launch of AAI, which specializes in dryland agriculture, was challenging but relatively easy. It was due to personal connections made through CKC and Onuma and many of these are still solid AAI supporters.

Yield Survey at the Experimental Station in Abu Dhabi