

Research Training in Benin

1. **Name (Affiliation, Position).**

Satoru OHNO

(1st-year master's degree student at Graduate School of Agricultural and Life Sciences, The University of Tokyo)

2. **Host International Agricultural Institute.**

Africa Rice Center (Benin)

3. **Training period.**

21 Sep 2012 – 16 Dec 2012

4. **Research Theme.**

Spatial Distribution of Rice Yield and Soil Fertility in Rice-Growing Inland Valleys in Benin

5. **Host Scientist's Name (Position).**

Dr. Shin Abe (Soil scientist)

6. **Understanding on international working environment (difference from Japan).**

[Site location, Security]

Africa Rice Center is located 20 minutes by car from the city center of Cotonou. So it is easy to access. Grass and Palm trees are planted around Africa Rice Center. They make the beautiful and tranquil atmosphere. Most of the researchers who work there commute by courtesy car. Large experiment field is expanded around the research institute and whole the place is fenced in, so outside and inside of Africa Rice Center's area is completely separated. There are always security guards at the gate of the entrance and they stop every cars passing there and make identity confirmations. It seems that because public order of Benin is not as good as of Japan. That is why they have such a thorough security.

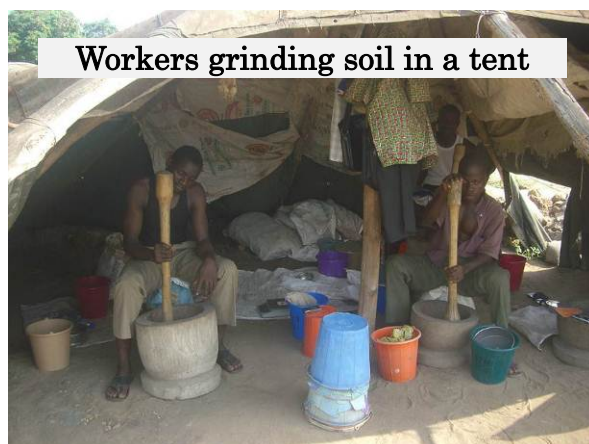
Most of the people who work here start working at a fixed time, and finish working at a fixed time. They look they do not work overtime. It might be because that there are many people who use courtesy car for commuting.



[Research environment]

I found irrigated rice fields next to the building of Africa Rice Center in which several varieties of rice have been cultivated. There are shelters in places. And in the each shelter, there is a man. They watch rice to protect them against bird damage. If birds come, the men scare them off by shouting.

When workers grind dried soil samples taken from rice field, they use a big mortar and pestle which are usually used for cooking. It seems that the number of experimental instrument is limited. The number of experimental laboratory is also seemed to be not so many in the institute. The grinding operation was in fact being conducted in a tent outside of the building. Also note that the facilities for chemical analysis of soil are poor. If soil analysis is needed, you have to ask another institute. So the soil I took this time is going to be imported into Japan and be analysed in Japan. When you try to begin precision experiment in Africa Rice Center, you first have to order to the company since materials and chemicals are often missed in the Center. Moreover, many of the sales companies are not in Benin so things must be imported from foreign countries. The period from the time of planning an experiment to the time of starting the experiment there is very long unlike that in Japan where you can receive your order in time. A meticulous preparation is required.



The use of computer or analytical instrumentation has to be taken care of, because blackout frequently happens due to lightning strokes and so on. There is high possibility of data loss or failures of analysis.

7. **Research knowledge and skills gained.**

[Chinese help]

Koussin and Lele, in Cote d'Ivoire, in south-central Benin, are the rice fields maintained by Chinese support about 15 years ago. There is irrigated lowland rice field of more than 100 ha as well as upland rice field of more than 100 ha.

Although Farmers had originally practiced farming by themselves in this region before the help of China, there has become a main rice production zone since then and is now known as an unignorable place of rice production in Benin. What China did as help were supply of power tillers, tractors, and farming implements like rice polisher, and construction of storehouses and ditches. China is no more involved with rice cropping there at present. But they still come to the field to have a look from time to time.

[The Association of Farmers]

The farmers work in Koussin and Lele are divided in to 11 groups and rice is shipped by each group. 1 group consists of around 10 farmers and there are positions of president and secretary in each group.

[Rice cultivation]

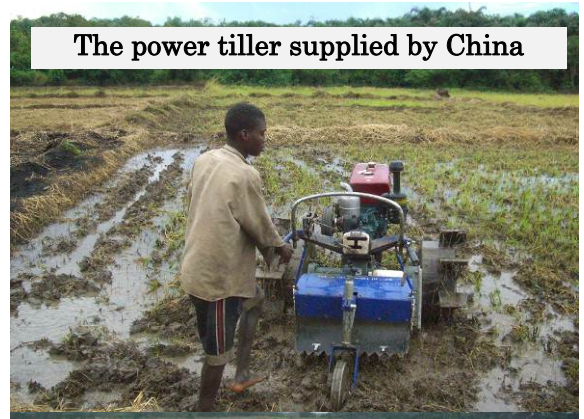
It is possible to grow rice 3 times a year in the study region. But the actual number of rice growing practiced there is 1 or 2 because of floods during rainy season, from June to August. Preparation for rice planting begins in the middle of September. Weeds, removed from the fields by herbicides and hatchets, are made dried and burnt. Then, water is poured on the fields and fields are tilled up by a power tiller before rice planting. Rice fields are divided into small plots by ridges to let water flow to the whole rice field because it is difficult to evenly fill a large field with water at once there. So the plots come in various sizes. And, the exact area of the field is uncertain since it is expanding as farmers reclaim farm land every year.

The water available in the field is coming only from a stream on the north part, is limited. It is impossible to irrigate the all plots in the field at once so the farmers have decided the order of water use among them and each farmer carries their farm work on in accordance with their own water use schedule.

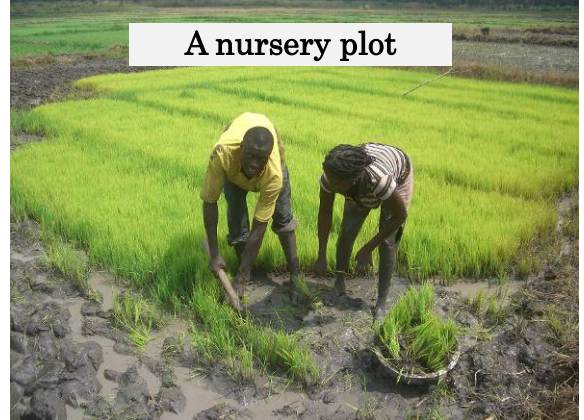
Seedlings used for planting are raised in 1 plot while the field is prepared for planting. At the harvest, rice is first cut by a sickle and then threshed with a drum can to thresh. Secondly, they spread the paddy they gather on a mat to dry. Then they polish rice or directly pack them up for sale.

[Soil sampling]

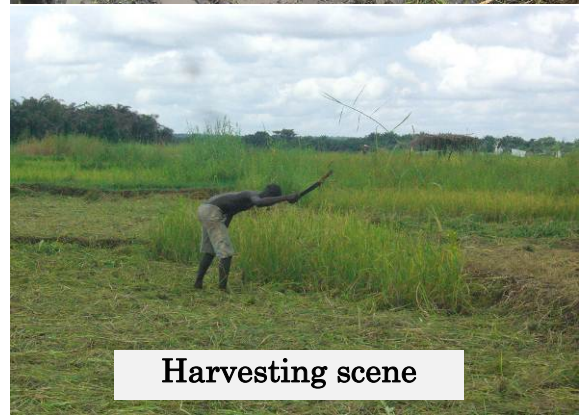
Soil was sampled in the study region, Koussin, in this research. Each sampling point was recorded by GPS to put soil data on a map. The chemical property. To figure out the shape of the whole field, the farmer followed and the tracks were recorded.



The power tiller supplied by China



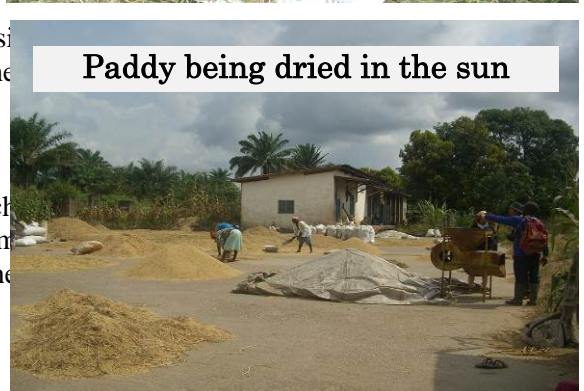
A nursery plot



Harvesting scene



Threshing scene



Paddy being dried in the sun

I learnt how to use GPS from scratch since it was first time for me to conduct research using GPS. Although I was bewildered using GPS at first, I increasingly got used to it and finally got be able to do basic operation, like how to mark the way point, how to transfer the data into computer , and how to edit them.

The soil data is going to be shown every 30m on a map, so soil was taken from the rice field every 30m. In concrete terms, 1 plot was chosen in every about 30m and soil was sampled from 4 points from each plot. A soil sampler was utilized for sampling in dry plots, while a shovel was used in wet plots.

The important point in soil sampling is to look over the whole sampling area from a higher place and capture the entire picture of the field. Then you decide sampling points considering land form and vertical interval. In addition, when you take the soil which is under the water or is so wet like mud, it is important to take more soil than usual. Because those soils will be very lighter if they become dry.

All the soil samples will be imported in Japan and analysed in my university after they become dry and ground. So the import clearance procedure of the soil was needed and I could know the means and flow of soil importation through this experience.

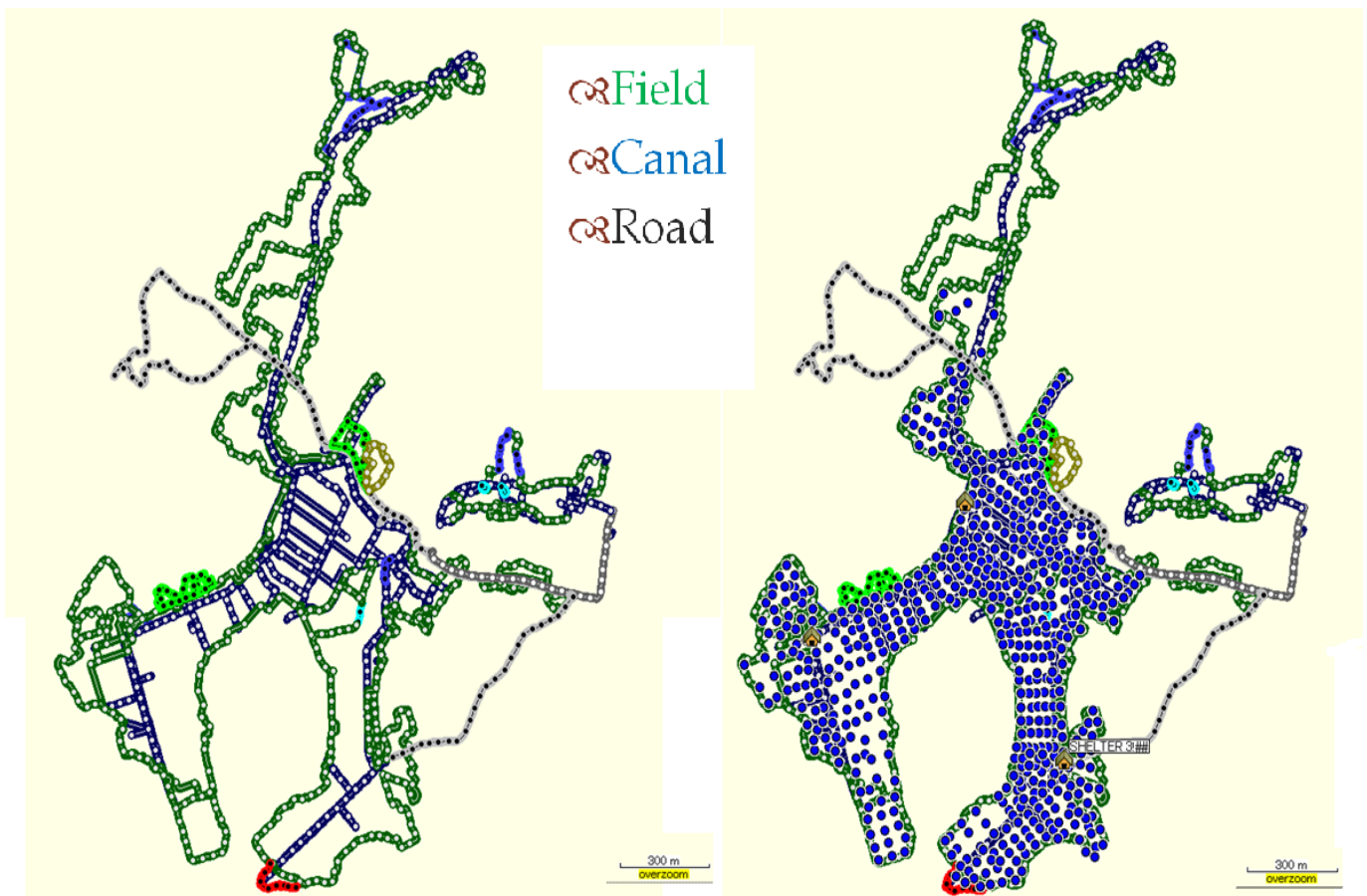
I was surprised at the strictness of the rule of imported soil, as I knew that the places of storage, analysis, and disposal have to be checked.

[Assistant]

The research funding I received for this training was used not only for purchase of experimental equipment but also for employment of assistant who helps my work. He helped soil sampling, GPS working. He even worked as an interpreter when I need to talk with local people.

It was new finding for me that a research funding used for research can be spent for employing workers to make research work efficiently proceed. Research funding is not the thing used only to buy materiel for experiment like seeds, seedlings, chemicals, and instrument.

This experience of having an assistant made me think about moving others to act as an employer. I realized that you have to take the responsibility for every your decision and action when you have workers under you and your judgment makes the quality and efficiency of your work. The decisions with deliberation are needed. As it was the first time for me to hire a man, I could learn a lot from it.



Maps of KOUSSIN recorded by GPS.

The blue dots on the right side map indicate soil sampling points (582 points in total)

8. **Plans for application of knowledge and skills gained in the future.**

I wish to conduct researches taking advantage of GPS functions in the future, since I have obtained how to use GPS.

I could learn from this training that it is important to understand the situation of your study field before you start your experiment. And the strategy of your experiment should flexibly be changed according to the status of study field. For instance, in a case of the research for yield increase, the information of the target place, the climate, agricultural form, the condition of soil, the organization of the farmers, to name but a few, is firstly collected then the defects can be found and removed. This method, knowing your opponent and drawing out a scheme, is generally applicable to any job. I will never forget gathering information and checking the reality when I begins something.

From what I learnt through hiring an assistant, I promise that I will always work keeping the importance of every single my decision for my job in my mind when I get the position of an employer.

9. **Possible or desired contribution to international agricultural research activities by Japan (especially to Africa Rice Center).**

What the way of contribution which Japan can do for international agricultural research activities is giving the training of researchers and workers who work in the institutes.

Most of the researchers working in Africa Rice Center come from other countries. They grew up and studied in a foreign country. But, when you research, you first have to know the research place. It is important to understand and see the picture of the field correctly if the research's goal is the development of farming methods or agricultural technique suiting local agricultural form and local society. That means the most suitable person for a research is the person who knows the local culture, language, and ethnicity. And that is obviously the local people. So the cultivation of local researchers is absolutely necessary to conduct the researches with more significant theme and agenda. By doing this, the development of local agriculture gets quicker and smoother. Especially in a hearing investigation of social science, it is closely related to the success of a research to have an intricate understanding of even the meaning and nuance of local people's talk. The necessity of researchers from local people becomes higher.

Training of the workers in the institute is also necessary.

Workers in Africa Rice Center are from the people living around Africa Rice Center. Many of them normally do not have the basic knowledge and rule of science. So they sometimes collect unreliable data by doing works in the wrong way. To prevent this problem, it is important to teach and train the workers. Of course there are the jobs which require technical knowledge. But most part of the basics is developed by education works had in the past. In other words, to raise the quality of the research ongoing in the institute, raising the quality of the workers is needed. And to raise the quality of workers, raising the quality of education in Benin is needed.

What we can do to cultivate researchers and workers working in Africa Rice Center is support of education to lift up the level of education in Benin. Support of Science education which builds scientific thinking is particularly important. The examples are arrangement of new educational materials like textbooks, construction of schools having a laboratory. Growing highly qualified teachers is also needed. If computer education is also held in schools it is better. By this support, the level of education becomes higher and the work ability of people in Africa Rice also becomes higher. It helps producing Beninese researchers very much.

Another way to lift up the level of researchers and workers is to run a training workshop. In the workshop, instructors from Japan teach the technique and knowledge of research to the university students majoring in science, young researchers, or new workers. Support of overseas education to Japan for local students is also good as the students can see advanced technology and learn how we, Japanese, approach to research here.

Another thing we can do to contribute to international agricultural research activities is to create good conditions for experiment in institutes. For example, donation of experiment tools, foundation of building. It was impossible to have a precise scientific experiment in Africa Rice Center so I strongly felt that kind of condition should be ameliorated. This help should be in kin. Otherwise the money will be used for other things.

In addition, it is also one way of contribution to devote much effort to the eradication of endemic disease in research regions. For example, going in fresh water in Benin is at high risk of becoming infected with Schistosomiasis. It is easily comprehensible that people hesitate to have rice research, especially paddy farming, in such places. From that point of view, to find a way of the eradication or to create a medicine for prevention of Schistosomiasis is a big key to make the research activities of Africa Rice Center smoother. So the first thing we have to do when we think of contribution to international agricultural institutes can be contribution to international medical and health research.

10. **Impression of the nation(s) during the stay other than research activity.**

[City]

Although I got an impression of a quite urbanized country from the sight of passing cars and motorbikes on paved main roads in big cities like Cotonou and Porto-Novo, once I took a step into a side road I realized Benin is still actually a developing country as I could see the roads are all rough dirt roads. The air in cities is polluted by dust and exhaust gas. Moreover, it is hygienically awful that there are many water-covered roads after rain and you can find lots of puddles in the middles of roads for few days due to defective drainage facilities.

The people riding a motorbike are often in sandals and not wearing a helmet. I was horrified by thinking of traffic accidents they could have. The scenes which cannot be seen in Japan, of a woman riding a bike with a baby on her back or six people riding on 1 bike drew my attention. And It is still vivid in my mind for the strange sight that there a lot of stalls selling bottles of petrol on the side of roads.

If you walk in cities, you can see how big Chinese help to the development of Benin is. Almost all of the cars and motorbikes used in Benin and convenience goods are Chinese-made. Huge road works are being carried on under Chinese supervision. I never would have guessed China has moved into Africa so much. So it was really surprising to me. The infrastructure construction of Benin might not be encouraged without China. The Beninese seems to have affection for the Chinese. Everywhere I go, I was frequently called "Chinois!" by the people of the town. The skillfulness of Chinese global expansion is impressive, indeed.

[Food]

I always had a meal out. There are few eating places in Cove, the study area, so I had the same meal almost every day. Most of the food is spicy seasoned with chili peppers. They are too hot for me as I am not keen on hot food. But I could get used to the food day by day.

One day, I found that the meal my assistant eats is always simple like rice or akassa with a piece of fish and sauce. He does not eat vegetable. I first thought he has poor food because he saves money. But as I talked with him I knew that it is in fact the general meal in Benin. I felt the difference in cuisine culture. I suppose they the Beninese use wider variety of food for their cuisine at home than I actually saw during this training, but I still feel they consume low amount of vegetable in their life. I could not see leaf vegetable though I saw potato and bean a lot. Vegetable seems to be considerably expensive but it is not healthy so I strongly felt the necessity of spreading the habit of eating more vegetable.

The tap water in Benin is safe to drink. I was surprised when I knew it. Because I never thought I can drink water directly from the tap. This is the achievement of Japanese help for the construction of filter plants in various locations. I could find an unexpected connection between Benin and Japan.

[Education]

Not all the children in Benin get an education. There are many parents who let only their first or second child receive an education because they want their rest of children to help the family business. Furthermore, about 1 out of five students in the first or second year of primary school quit school since all the classes are conducted in French, not in their local language so the children who cannot keep up with the lessons come out. Everyone in Japan can receive an education and get the basic literacy. But Here in Benin, it is not. The people unable to use French there have to live an inconvenient life all through their life. It is very hard. According to what my assistant says, the education provided in their local language is needed. Having touched on the educational problem I had never known of a developing country, I realized there are still many unsolved problems in the world.

11. **The sentiment throughout the whole training.**

When I heard the worlds "an international agricultural institute", I just had the desultory image of the place where investigation and research are conducted with the world's most advanced scientific technology and excellent people. It was a place for me which is far from me and exist only in my mind. However, the institute which was just an image became a reality by going there and seeing it firsthand through this programme. I am very glad that now I can have the picture in my mind of myself working there.

I regret that I could not have a look around Africa Rice Center, slowly and carefully. And if there are more opportunities for participants to meet and deepen exchange with each other before going, it will be much better.