

Kenya and Tanzania

Agricultural Projects

Project Sites

Ujuwanga and Moshi



1. Background and Objectives of Evaluation Survey

In many sub-Saharan African countries, the achievement of self-sufficiency in food production is the highest priority of agricultural policy. However, with continued reliance on rainwater for cultivation, it is not easy to secure stable agricultural production.

In this region, JICA has a long history of technical cooperation in agriculture and dispatch of Japan Overseas Cooperation Volunteers in order to make a contribution to improving food production.

This evaluation survey looked at Kenya and Tanzania, which are the chief recipients of Japanese technical cooperation in this field, and focused on assessing the effects of cooperation (especially its social impact) by conducting interviews with counterparts (including ex-trainees) and farmers who were beneficiaries of aid.

JICA asked Mr. Shinichi Takeda of the Kahoku Shimpō, a journalist who has visited many sites of international cooperation and has vast experience in covering projects related to rice cultivation, to be the evaluator for this evaluation.

2. Evaluated Projects

(1) Tanzania

The Kilimanjaro Agricultural Development Project Phase I (September 1978-March 1986, Project-type technical cooperation)

The Kilimanjaro Agricultural Development Project Phase II (March 1986-March 1993, Project-type technical cooperation)

The Kilimanjaro Agricultural and Industrial Development Center Construction Project (FY1979, Grant aid)

The Kilimanjaro Agricultural Training Center Project (July 1994-June 1996, Project-type technical cooperation)

(2) Kenya

Japan Overseas Cooperation Volunteers (Rice cultivation, 1978-1987, 1997-1999)

3. Members of Evaluation Team

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4. Period of Evaluation

6 February 1999-25 February 1999

5. Results of Evaluation

(1) Tanzania

1) Overview

On the outskirts of a small city called Moshi near the Kenyan border, which is an eight-hour drive northwest of Dar es Salaam, Tanzania's main city, there is a large expanse of irrigated paddy field that Japan has developed through over twenty years of aid and continues to support. The paddy field covers an area of around 1,100 hectares with the 5,896-meter Mt. Kilimanjaro looming in the background. The region is no different from Japan's rice growing areas except for the strangely shaped baobab trees that symbolize Africa. The recreation of a Japanese rice growing area in foreign soil in the savannah climate is striking.

Japan's assistance for rice cultivation in the region called Lower Moshi, the lowland area surrounding Moshi, began in 1978. Japanese aid came to an area of land where people eked out a living with rice cultivation and farming that was dependent on rainwater. With an injection of close to 8 billion yen in combined grant aid and yen loan aid, Japan developed 1,100 hectares of irrigated paddy field and 1,200 hectares of up-land farmfield, and also provided related facilities.

In terms of technology, JICA's project-type technical cooperation consisted of two phases from 1978 to 1993, during which time a technical training project was carried out. Advanced rice cultivation introducing the high yielding variety IR54 took root. The aid quickly produced results

achieving harvests of six to seven tons of unhulled rice per hectare.

All at once, a major rice producing area capable of yielding close to 7,000 tons, even with a single annual harvest, was born at the foot of Mt. Kilimanjaro.

Moshi was originally known as a coffee and banana producing area. This region was a typical area for the production of the famous Kilimanjaro Coffee. While the downtown area at the foot of Mt. Kilimanjaro is at an altitude of 850 meters and is very green, in terms of climate, it is located in the semi-arid savannah belt but has high rainfall thanks to the mountain, and bananas are an abundant staple food. As a border city there is frequent movement of people and goods and a lively atmosphere.

In recent years the presence of rice and Japan has loomed large as factors further enlivening the activity in Moshi. Looking around the market in the center of town in a country where "Ugali" made from maize flour and bread made from wheat top the list of staple foods, rice stalls account for half of the cereal stalls.

Baskets piled with white rice are lined up in the front row. When I asked the woman selling the beautifully polished rice in the top locations on the roadside what variety of rice it was, she replied "Jappani". This means Japan in Swahili. I was told Jappani specifically refers to rice from paddy field created using Japanese aid.

I was impressed that Japan is embedded in the name of the variety as if symbolizing 20 years of aid. The rice fields at the foot of Mt. Kilimanjaro have added rice production to the list of terms synonymous for Moshi that already includes coffee production and banana production.

2) Results at the Farmer Level

In order to see the changes in the lifestyle of farmers brought about by rice cultivation aid, I walked around Mabogini, one of the villages in Lower Moshi. GNP per capita in Tanzania is US\$210. At 1/180 that of Japan, this is less than 1 US\$ per day. Tanzania is one of the poorest countries in Africa. Living standards in rural communities are low, and houses with mud walls, dirt floors and grass roofs are not unusual. The Moshi district is no exception and there are houses that would be viewed as little more than huts in Japan. However, going into Mabogini, which is adjacent to the paddy area, there were many solidly built houses with plastered walls and tin steel roofs.

I visited a farmhouse on a road in Rau area. It was an attractive five-bedroom house with blue walls and an entrance porch with a roof. In the concrete floored living room there was an impressive sofa and a black and white television. The starched shirts and gleaming leather shoes were tangible signs of the comfortable lifestyle. When I asked the owner of the house, Mr. Shabani Mbindu (52), about his living circumstances he answered "Everything is thanks to growing rice. Rice has brought prosperity. I am very grateful for the Japanese cooperation," with particular emphasis on



Rice fields at the foot of Mt. Kilimanjaro, developed with Japanese aid (Lower Moshi, Tanzania)

"prosperity" and "grateful."

Mr. Mbindu, who moved to Mabogini in his father's time, acquired land and began growing rice in 1973. Although he began by cultivating 0.6 hectares, he obtained a harvest of around 15 bags of un-hulled rice depending solely on rainwater cultivation. One bag is around 80 kilograms so it only worked out to a harvest of around two tons per hectare. On another 0.8 hectares of up-land farmfield he grew maize and tomatoes but with no better results. Compared to farmers in the highlands who produced coffee and bananas, the farmers in lowland Lower Moshi, which had low rainfall, did not have a main crop. They worked hard simply to eat.

Things have changed dramatically since 1985, when the irrigation channels were put in and the paddy field developed using Japanese aid. With training from JICA, a three-fold increase in harvests has been achieved. Mr. Mbindu recounting the emotions of the time says, "Some people opposed the development thinking that their land would be taken away. Even people who believed in the aid, including myself, did not imagine anything like this. We were amazed." Mr. Mbindu bought more rice fields and became a full-scale rice farmer cultivating 1.5 hectares. His production is an average of nine tons per year. At a stroke, rice brought about nearly an eight-fold increase in incomes.

The first result of the increased income was his wonderful five-bedroom house. He built it in 1990, five years after he began cultivating rice under the aid program. He says happily, "Our life has changed greatly. We were able to send five of our seven children to school. The eldest son went until secondary school and the second eldest went to college." His wife, Mrs. Masina Yusef (43), listening to the conversation, nods vigorously in agreement and adds, "Everything has changed for the better from our food to the household decorations."

The house where Mr. Mbindu's family used to live still stands close by. He showed me around, and it was a very small house like a hut with mud walls and a grass roof. This reminder of the changes that have taken place over the last ten years moved me. "My next goal is to own a car." The couple was smiling as I left. It is very promising when

farmers speak of their dreams for the future. It confirms that the crop to which the farmers of Lower Moshi have entrusted their hopes has taken root.

3) Impact

Two thousand farmers, mainly people who originally owned land in the area, are cultivating rice in the 1,100 hectares of paddy field developed with Japanese aid. On average the area cultivated is around 0.5 hectares per person, so the scale of cultivation is not great. Despite that, as a result of the dramatic increase in yields brought about by aid, the income from one block (0.3 hectares) with single cropping is 350,000 Tanzanian shillings. With an average 0.5 hectare holding, income is slightly less than 600,000 shillings. With double cropping this doubles. Mr. Mbindu, who has 1.5 hectares, can earn 1.8 million shillings even with single cropping. As the average annual salary for a public servant is 500,000 shillings, it is an exceptionally high income. It is no wonder that the lifestyle of farmers has changed dramatically. Even excluding production costs, such as fertilizer and wages (approximately 40% of gross income), it is possible to make a net profit of 350,000 shillings per 0.5 hectare. The net profit for coffee on the same area of land is 200,000 shillings. Due to increased yields, rice has become a much more profitable crop than coffee, the traditional commercial crop of Moshi.

The promise of rice as a cash crop has led to an increase in the price of paddy fields. When I asked the farmers about prices, apparently one paddy block in the aid area cost 70,000 shillings in the late 1980s, but in the 1990s it rose sharply to 150,000 shillings. Now the price has jumped up to 600,000 shillings. The climb in paddy prices indicates the sharp increase in farmers who want to cultivate rice in this area.

In fact, rice fever has rapidly spread throughout Lower Moshi. Touring the local area, you realize that the paddy belt is much larger than the official figures of around 1,100 hectares. This is because large areas of paddy field stretch on beyond the fields developed by aid. They are all paddy fields developed independently by local farmers on their own land imitating the work being carried out by the aid project over the last ten years. This incredible pace of expansion has enlarged the area to well over 500 hectares.

In the process, people other than farmers have begun cultivating rice. The most enthusiastic are agricultural extension workers who are public servants. Local extension workers who have carried out cultivation training for farmers as JICA experts' counterparts, have started growing rice as a side business on their days off.

At a meeting of eight managerial staff in charge of cultivation training for the aid paddy field to explain the aid area, I asked about side jobs. All of them answered without hesitation that of course they grew rice themselves. Their attitude was that it would be crazy for a staff member not to, considering how profitable it is. Some of them leased one or two paddy blocks in the aid area while others engaged in full scale rice cultivation buying as much as two hectares of land outside the aid area. "Public servant salaries are low.



With training from JICA experts, rice cultivation takes root-Lower Moshi, Tanzania

By growing rice, I have been able to build a house and send my children to school." "The Japanese aid completely exceeded our expectations." All of them echoed the comments of the farmer Mr. Mbindu. Many extension workers are unwilling to transfer from Moshi because they do not want to lose their income from rice. The side jobs of the extension workers have also had the benefit of disseminating high yield rice cultivation expertise and promoting the independent development of paddy fields.

Ironically, the expansion of rice cultivation also created problems. The arbitrary drawing of water from the upper reaches of the irrigation channels has the negative effect of not allowing the water to reach the aid paddy field. Water theft is a daily occurrence, and the aid paddy field has suffered from chronic water shortage since the 1990s. The initially performed biannual harvest became impossible, and it is now becoming impossible to guarantee even one crop per year for every farmer.

There have also been frequent incidents involving water theft. I saw the remains of a burnt out hut next to a water channel. Farmers in the aid area hired spear-bearing Masai warriors to guard against water theft. Apparently, the Masai guard hut was attacked and burnt down. Clashes tend to become violent in such cases where income is concerned. A JICA expert said, "The only solution is to secure a new water source and develop new irrigation channels." A new irrigation plan is being considered in the local area in order to find a solution.

The severe water shortage problem could also be termed a "side effect" brought about by the repercussions of the rice cultivation aid. The increased interest in rice cultivation and the rapid expansion of paddy field themselves are major results of the aid. The local people are openly pleased with the positive impact brought about by rice production.

"The population of the village has increased more than four-fold and the village has come to life." These are the words of Mr. Zablou Sarakikya (51) who lives in Chekereni, another village in Lower Moshi. He is a managerial official of the Ministry of Agriculture who has received rice cultivation training in Japan. The population of Chekereni,

which was about 1,000 at the beginning of the 1980s before the rice cultivation aid began, has now swelled to 4,500. In the neighboring village of Mabogini, where Mr. Mubindu lives, the population has also apparently doubled from 3,000 to 6,000.

"Farmers who used to grow maize in the highlands have gradually come down to Lower Moshi looking for work. Many farmers, including paid farmhand, have even come from other provinces several hundred kilometers away." The rice fields generate a lot of employment. A lot of labor is required, including the jobs of transplanting, weeding, harvesting and chasing birds-which is suitable for children-when rice cultivation is not adequately automated.

When I toured the villages, there were large numbers of people in the rice fields. The villagers gathered, including children and adults, men and women, and worked hard at transplanting or harvesting while talking. The average labor required for rice cultivation in Lower Moshi is 70 people for one paddy block. Farm laborers continuously come looking for various types of rice field jobs and the population has expanded.

"In Chekereni 95% of the village children attend elementary school. In other villages, the figure is 70 % at best. This is thanks to rice cultivation," says Mr. Sarakikya, who is also the chairman of the PTA for the village elementary school, stressing the increased economic power of the villagers due to rice.

Rice cultivation has also spread outside Moshi. In Kilimanjaro province, where Moshi is located, rice cultivation using the high yielding variety introduced into Lower Moshi with Japanese aid has spread spontaneously and the area under cultivation has reached 4,200 hectares. The province's rice production has increased five-fold in the last ten years to 55,000 tons.

I visited the province office of Kilimanjaro and Mr. Paul Chikira, the province's chief administrator, said "Rice has given hope to the province's farmers, particularly the low land farmers who until now struggled for their daily food. Rice has great value as a cash crop and is also an important crop for Tanzania's self-sufficiency in food. Japan's rice cultivation aid is very significant." While showing his pride in the rice producing area that has bloomed at the foot of Mt. Kilimanjaro, the chief administrator expressed his gratitude to Japan. The dramatic changes in Lower Moshi brought about by rice cultivation, which could be termed a rice revolution, illustrate the scale of the impact of agricultural aid.

(2) Kenya

1) Overview

The small town of Shiaya lies about a two-hour drive northwest of Kisumu, the main town on the shores of Lake Victoria in western Kenya. When I visited Kenya for the survey, Mr. Takaaki Imazono (29) of the Fukuoka Prefecture Regional Agricultural Improvement and Extension Center was acting as the Japan Overseas Cooperation Volunteer in rice



Jappani rice from the aid area is in plentiful supply in the markets-Moshi, Tanzania

cultivation. He returned to his job in Japan in April 1999. Mr. Imazono told me that there was a village he really wanted me to see: Ujuwanga, on the outskirts of Shiaya. He said, "I have only recently become aware of it myself. Hearing that there was a village where the Chinese had taught rice cultivation, I went to have a look and found that Japanese had patiently carried out aid there over ten years ago. Looking at the results of the training which gave consideration to the independence of the farmers, I was truly moved." Following Mr. Imazono's advice, I headed to Ujuwanga.

2) A Series of Results

Leaving the Shiaya trunk road, I traveled along a potholed country lane into the interior. Although I was already in the village, I did not see any notable settlement. In a quiet place where there were only two or three houses, there was an incongruously magnificent brick building. Inside there was the sound of machinery. Looking in, I saw several men amidst a deafening noise. Rice husks flew all around. A small model rice-polishing machine, made by a Japanese manufacturer and standing about two meters in height, was at work.

The men led me to the rice fields on the outskirts of the village. After descending a gentle slope, they suddenly came into view: neatly divided rice fields stretched out along the low ground on the banks of a river. It was clear from the rice stubble that rice was being cultivated in precise rows. This is not an account of a proper town on the map such as Moshi in Tanzania. It was a surprise to find a rice polisher made by a Japanese manufacturer at work and a high level of rice cultivation firmly established in a village in the backwoods of Kenya where it was difficult to image any connection with Japan at all.

Mr. Onyanko Masiga (45), the administrative head of the Farmers Association, explained the connection with the Japanese on behalf of the village, saying "The Japanese taught the village everything about rice cultivation, and the Japanese

also gave us the rice polishing machine." During his explanation he readily recounted the names of the Japanese people who had provided the training, "Toyokama, Hakariya, Oda, Kobayashi." The villagers standing around also nodded vigorously and repeated the names. When I referred back to JICA later, I found each person. They were Mr. Yasuki Toyokama, Mr. Shinichiro Hakariya, Mr. Masami Oda and Mr. Tsutomu Kobayashi. I discovered that they were Japan Overseas Cooperation Volunteers dispatched to the Shiaya Office of the Kenyan Ministry of Agriculture for two to three years each between 1978 and 1987. I was surprised again that the villagers had accurately remembered the names of Japanese people whom they had met more than ten years before, and that the names of Japanese youths were repeatedly brought up as "benefactors" in the small village.

The irrigation water channels in the village were made with aid from the Netherlands and full-scale rice production began in 1977. Initially about 20 acres (eight hectares) was cultivated. However, rice cultivation was transformed when the Japan Overseas Cooperation Volunteers came to the village through the Ministry of Agriculture. A succession of volunteers taught the basics of rice cultivation, including making precise ridges between rows, planting in straight lines, using high yielding varieties and the correct use of fertilizers. As a result of the training, yields increased three-fold, and rice cultivation rapidly expanded. Today 180 people cultivate 200 acres, which is ten times the original area, and Ujuwanga is known as the village of rice.

This is a summary of Mr. Masiga's explanation. During the training the volunteers brought 40 hand-operated weeders to the village and 25 of them are still being used. Supplementing Mr. Masiga's explanation the villagers all praised the activities of the volunteers with comments like "the Japanese often came three days a week" and "they came into the rice fields with us to teach."

This was not the only legacy of the volunteers. The highlight was the introduction of a rice-polishing machine. Mr. Masiga also explained this in detail for me. "If farmers can deliver rice that they have polished themselves, it will double the profits from rice cultivation. Then, the village can become independent through rice." This was the thinking of the volunteers, and Mr. Hakariya requested assistance from JICA. Apparently, the rice-polishing machine arrived in the village in 1987, during the tenure of Mr. Kobayashi.

The rice-polishing machine was not given easily. In order to test the motivation of the farmers, the volunteers made the construction of a building to house the equipment a condition for the provision of the rice-polishing machine. In response, the village immediately built a magnificent brick building as a rice mill. The volunteers also advised the village to accumulate a reserve fund by collecting fees for rice polishing in order to prepare for buying new equipment before they left the village.

The dispatch of the Japan Overseas Cooperation Volunteers through the Kenyan Ministry of Agriculture was completed with Mr. Kobayashi. For the next ten years, until



Farmers have built a "village of rice" using a rice polishing machine obtained through aid, Ujuwanga, Kenya

Mr. Imazono visited the village, all ties between the village and Japanese people were cut. The operation and maintenance of the rice-polishing machine were entirely in the hands of the village during this time, and the farmers followed the advice to build up a reserve fund perfectly. I discovered the evidence of this in a corner of the rice polishing building. There was a new rice polisher still carefully packed. It was a machine made by the same Japanese manufacturer as the one in operation. Apparently the farmers had invested the large sum of 700,000 Kenyan shillings from the reserve fund and purchased it in 1998. The farmers had gone to great pains to do everything themselves from the order procedure through to making the payment.

"Today farmers come to the rice polishing building from villages twenty kilometers away. We polish more than two tons of rice per day, and the number of users from outside the village has increased to 300. Because we have a rice-polishing machine here, surrounding villages have also begun to cultivate rice. Rice cultivation has spread from here." Mr. Masiga continued proudly, "Everything about life in the village has improved due to rice. Soon, we will begin operating the new rice-polishing machine. We also plan to expand the rice fields." There was deep confidence in Ujuwanga as an independent "village of rice."

3) Subsequent Results

Unlike major projects, the individual activities of Japan Overseas Cooperation Volunteers are not recorded systematically with a focus on results. This holds true for the legacy of aid in Ujuwanga. JICA Kenya office first heard of it through the reports of Mr. Imazono. Without Mr. Imazono's frequent and tireless efforts to visit the village, the legacy might have remained hidden. Mr. Imazono himself was a traveling, grass-roots "rice cultivation missionary" whose activities were reminiscent of the work of previous volunteers.

Mr. Imazono, who was dispatched in 1997 to a development corporation in a different scheme from the one involving the Ministry of Agriculture, found little opportunity for activity at the organization to which he was dispatched. Therefore, he voluntarily began touring villages around Shiaya on motorcycle, deepening his relationships with farmers. During this process he heard about Ujuwanga. While touring the villages, he learnt that there was a great deal of interest in rice cultivation and he began practical training in rice cultivation for motivated farmers.

I visited one of the villages where Mr. Imazono had provided training. It was a village called Nyamasari, several kilometers from Ujuwanga. Part of a disorderly area of swampy land had been cleared and about ten acres of rice fields had been created. Although small in area, fresh green rice was growing in magnificent rows. I was told the rice field had only been finished ten months earlier. They had begun by clearing a mere 10m². In response to a request for training from Mr. Kaleb Okos (28), a farmer who wanted to cultivate rice, Mr. Imazono had cleared the rice fields with him.

Showing me a photograph, Mr. Okos said, "Mr. Imazono always gave encouragement. He took a hoe in his hand and worked with me to make the rice field. I will never forget how happy I felt when I had my first rice harvest." The photograph showed Mr. Okos smiling happily with the less than 10 kilograms of rice harvested from the first 10m² of rice field. He said "I thought that growing rice was difficult but I managed to get a harvest from the beginning. Mr. Imazono has been great. I was so happy and I shared the rice with my friends. I myself have been recommending rice cultivation to everyone. I want to increase my rice fields to about two hectares in the future." Four farmers in the area had begun to cultivate rice, and all of them expressed the hope that with rice cultivation they would be able to use under-utilized marshy land and make money. With its reputation spreading by word of mouth, rice cultivation has begun to spread into the villages of western Kenya.

Mr. Imazono said "To be honest, until I came here I didn't know that rice cultivation cooperation projects were in such demand and were so helpful. I am not teaching anything special. I myself only know the bare basics of rice cultivation. However, there are no teachers in Kenya and no books either." He went on to explain, "In western Kenya there are still hundreds of hectares of land patches where rice cultivation is possible. I think that Japan has a very big role to play," he stressed.

The legacy in Ujuwanga and the progress in Nyamasari share a common factor that results were produced by face-to-face, direct human interaction and contact. The technology is communicated through people. The grass roots aid activities that have taken root in Kenyan rural villages show that this is also the starting point for rice cultivation.

6. Conclusion

Japan has carried out numerous aid projects based on



Rice cultivation spreads to tiny villages due to the efforts of Japan Overseas Cooperation Volunteers, Nyamasari, Kenya

requests from Africa in countries, which hope for increased rice production and expansion of rice cultivation. Solely in terms of ODA-related projects since the 1980s, there have been vigorous activities in aid investment for technical cooperation in rice cultivation in countries such as Nigeria, the Ivory Coast and Kenya.

There are only two major ways to increase the production of rice and other agricultural products. The first is to increase the area under cultivation and the other is to increase the yield per unit area cultivated (the unit yield). Increasing the yield over the same area achieves increased production. In other words, increased unit yields are the key to increased production. The history of rice cultivation in Japan and the rest of Asia is the history of increased unit yields. Rice cultivation aid for African countries has also had a major focus on increased unit yields. The question is how low-productivity rice cultivation with yields of only around two tons per hectare can be transformed into high-productivity rice cultivation. Japanese cooperation projects have responded to this with methods that include the large-scale development of rice fields and mechanization.

The aid in Lower Moshi, Tanzania, was the first project of this kind. In addition to developing irrigation channels and organizing rice field blocks, it introduced techniques for improvement and encouraged cultivation of high yielding varieties. This brought about more than a three-fold increase in yields, changed the lives of farmers, brought the region to life and proved that this type of cooperation opens the path to increased food production. It provides an answer, a model for increasing rice production and rice cultivation aid projects in Africa. One of the Japanese experts involved in the project in the past exquisitely described it as "a sort of pavilion at an international exposition." The Lower Moshi aid project was a kind of demonstration of Japanese and Asian rice cultivation on African soil.

In general, development-oriented aid tends to receive criticism. Despite the success of Lower Moshi, there are many problems and questions regarding whether similar aid can be expanded all over Africa. Equipment-provision type aid projects, which develop Asian-style paddy fields through the investments of the enormous sum of nearly eight billion yen, are not

possible everywhere.

Aid projects that prioritize equipment and facilities also tend to give rise to contradictions. When I observed another project, not the Lower Moshi project, that focused on training in rice cultivation machinery such as tractors, I learned that the actual training site had not been ready to introduce mechanization and was surprised by the discrepancies with the content of the aid project. There, the center facilities, which were the base for the project, had also been constructed in a strange location that was a long way from the rice cultivating area that was receiving the training. A Japanese expert pointed out the problem with equipment provision-type aid projects in developing countries, saying, "The partner country's governments tend to want aid such as mechanization. The content of the investment depends on those governments' requests and does not always suit actual circumstances."

There independence of farmers is also a serious issue. Even when modernization of rice cultivation is realized using aid investment, unless it is independently sustained by the farmers, the structure of aid dependency will continue. The farmers of Lower Moshi had formed Tanzania's first "farmers' cooperative" and had been consciously trying to achieve independent operation, but said they were still not able to manage repairs of agricultural machinery. I felt that more time would be needed before Lower Moshi was able to function without aid from Japan. If this is the case in Lower Moshi, which is a success, there are profound problems with independence and sustainability in other equipment provision-type aid projects.

It would be very easy if agricultural aid only entailed the supplying of funds and facilities to the partner country. Crops are different from industrial products. They need to be grown with careful adjustments according to the conditions of the soil and the environment. Should the cultivation techniques not take root at the actual location, all the equipment and facilities will be worthless. Conversely, facilities and equipment may wear out, but the techniques will remain forever. Ultimately the most beneficial aid is the education and diffusion of skills and techniques to people. While the results may be small, the legacy of the Japanese Overseas Cooperation Volunteers that I saw in a small Kenyan village demonstrates a typical example of transferring technology through personal contact.

The project type aid mechanism also serves to promote experiments in communicating rice cultivation ideas and techniques to a wide range of farmers and agricultural engineers. In Lower Moshi I observed a strategy to advance aid does beyond the mere provision of equipment and facilities. This was the Kilimanjaro Agricultural Training Center project.

The project which is abbreviated to KATC began in 1994 inheriting the facilities of the Kilimanjaro Agricultural Development Project (KADP), which had developed Lower Moshi. In KATC, extension workers and farmers from all over Tanzania, who will form the nucleus of rice cultivation extension, come together and undergo 45-day and 19-day residential training courses respectively. In five years more than 700 people have already been trained. The adoption of training in which farmers and public servant extension workers, who

tend to be seen as different social classes and receive different treatment in developing countries, participate jointly in revolutionary, and the project structure is stimulating the motivation to cultivate rice.

I observed a classroom where they were studying water management and cultivation techniques. About 30 farmers from the villages of Chekereni Weru Weru were having an enthusiastic discussion. "What will we do if we can't buy machinery?" "If about five people put up the funds it should be okay." "Yes, we can see if everyone in the village is involved, there is no problem." The classroom was a forum for the spontaneous confirmation of the concept of communal work, which is the basis of rice cultivation.

I visited a farmer who participated in two training sessions in 1997 and 1998 in a village about 60 kilometers to the west of Lower Moshi called Rakitatu. Ms. Marie Kuwaison (42) showed me around her own rice fields, which she said "changed completely after my training." She cultivated about 30 acres with neat ridges and well-spaced rows of rice. She said, "I used to harvest only ten bags (800 kilograms) before, but when I followed the training I managed to harvest 38 bags. Everything was new to me, including the techniques for leveling the rice fields and the selection of seeds. Now I am teaching neighboring farmers." I was also impressed by her comment, "I have been motivated by the rice fields in Lower Moshi I saw in training. I have worked hard, thinking that if I do things that way, my life will change". The Lower Moshi rice field, which is an exposition pavilion for African rice cultivation aid projects, together with the KATC training, has begun to increase the enthusiasm of Tanzania's farmers for rice cultivation.

Nonetheless, the Lower Moshi project in Tanzania, which tends to be seen as the results of investment in facilities and equipment, would not have succeeded without human interaction and exchange. Since 1981 when the full-scale technical training began, a total of 30 JICA experts have been dispatched to conduct local training for long-term assignments of around three years. Including short-term experts, the number reaches as many as 50. During this time, nearly 40 Tanzanian counterparts have received training in Japan. Through mutual human exchange, techniques that can increase yields three-fold was gradually absorbed.

Overcoming difficulties in culture, nature and education and transferring communicating technology is no mean feat. I spoke to Mr. Junji Inoue 70, now living in Nara Prefecture, who was the project team leader for three years from 1986 at the time when actual cultivation in the rice fields developed in Lower Moshi began. He said, "Although irrigation channels had been developed, the farmers were used to relying on rainwater for agriculture and had no concept of the communal use and management of water. Rice growing is communal work. We continually explained that unless everyone works together, nothing will work, not even a piece of machinery. All the instruction had to start from the beginning." Mr. Inoue, who had spent 37 years as a expert in rice cultivation in countries such as Bangladesh, Indonesia and Nigeria until his retirement in 1998, looked back on his experiences and declared, "The results of aid and cooperation grow out of human contact". He

also made great efforts to conduct training that had direct contact with farmers in Lower Moshi.

The role of experts does not end with technical training. They also have to work in a poor and chaotic country. He said, "At the project, you have to take care of all kinds of things. One time there was a break-in at the project equipment storehouse, and a counterpart was arrested by the police. He was definitely not a thief. I immediately went to speak to the police and pleaded his innocence. The suspicions were cleared, and when my counterpart was later released he cried tears of joy saying, 'I'm so happy that you believed in me and came to get me.' We still write to each other even now." Overcoming a variety of problems built up the trust needed for technical transfer.

One expert dealing with the aid area in Moshi at the time of this evaluation also said "Africa is hard physically and mentally. It is completely different from Asia. Theft is a daily occurrence. I have been betrayed by staff that I trusted countless times. It breaks your heart." Some experts had their cars stolen at gunpoint. Others suffered from malaria. But the work goes on amidst these difficulties.

"The farmers are finally developing a sense of communal work, and rice cultivation is becoming established. Together with the farmers I want to try to make Lower Moshi into a food producing center." These are the words of experts and engineers who have been conducting activities in rice cultivation. The fact that many engineers have braved dangers and difficulties to work hard and support the aid project in Lower Moshi should be kept in mind as should the activities of the Japan Overseas Cooperation Volunteers in Kenya.

When I visited Tanzania, a headline on the front page of the local newspaper saying "Deterioration in Food Situation" gave the government's forecast that the food crisis would worsen. The Prime Minister stressed that due to drought damage, cereal crops that had just been planted were not growing and made a strong appeal for food aid from other countries.

Africa frequently suffers from droughts. Major droughts in 1973 and 1984 affected all of Africa, and the 1984 drought produced 150 million starving refugees. Although natural disaster is a major factor, it has been pointed out that recent food shortages are caused by the limitations of dry field farming.

"Traditionally African farming is based on dry field cultivation, but with the rapid population increase, the period for which fields lie fallow has been shortened, leading to soil deterioration. There has been a pronounced decline in productivity," said Mr. Lucal Brader, then Director General of the International Institute of Tropical Agriculture (IITA), an international organization based in Nigeria, which I visited previously to cover a story on rice in West Africa. The land use cycle in dry farming for crops such as cassava, which was previously 14 years, has been shortened to about seven years. The soil has been depleted, and productivity has fallen. In order to increase farmland to raise production, forest zones in the hills have been developed, and African dry field farming is



Rice culture propagation in progress at KATC. Local staff teach these techniques, spreading rice cultivation techniques to the farmers in Lower Moshi, Tanzania

reaching its limit because of farmland saturation. The agricultural problem is directly related to environmental problems.

"In West Africa, there are 20 million hectares of low-lying marshy land but less than 15% of this is being used for agriculture. Unlike dry field cultivation, growing rice has the advantage that the same land can be used every year. The cultivation of rice in low-lying marshy land can be an important strategy in terms of Africa's food problems." This comment was made by Mr. Matron, then Deputy Director General of the West African Rice Development Association (WARDA), an international organization based in the Ivory Coast. The spread of rice cultivation could also be a way to reduce land used for dry field cultivation in mountainous areas. A discussion of the environmental advantages of wet rice agriculture is just beginning in Africa.

"Good things spread automatically and bad things die out naturally." While visiting Africa, I heard many Japanese involved in rice cultivation aid projects make this kind of comment. Agricultural techniques do not take root if they are forced. They only become established and spread when needed by farmers and the area. The current situation in which rice cultivation is steadily expanding in Africa is the confirmation of the continent's need for it.

To summarize the local expectations, including food and environmental issues, it seems that rice and rice cultivation may be an important key to the development of Africa in the 21st century. That is what I felt while touring the actual sites of rice cultivation aid projects. As a country that prides itself as the land of rice and possesses high-level rice cultivation technology, as well as rice-related cultures, Japan's role in realizing this mission is extremely important. The results in Lower Moshi and the legacy of grass roots aid in Kenya are merely the first step. We need to thoughtfully embrace the words of those who have been working hard at the actual aid in Africa, "You do not solely mind short-term results, but assist in developing Africa's rice crop cultivation over the long term, looking towards the next 10 or 20 years."