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# SUBSISTENCE RICE CULTIVATION AND THE FORMATION OF A DIVERSE RICE-EATING CULTURE IN THE RURAL VILLAGES OF SHIFTING CULTIVATORS IN SOUTHERN TANZANIA<sup>(1)</sup>

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**ABSTRACT** Tanzania, the largest rice-producing and rice-consuming country in East Africa, has unique customs and preferences for rice, some of which are similar to those of the Indian Ocean Rim region. By identifying geographical features, this study examines how subsistence rice cultivation, along with a diverse rice-eating culture, was formed in a village of shifting cultivators in southern Tanzania. Upland rice cultivation was introduced to this village around the 19th century, followed by paddy rice cultivation, though upland rice cultivation has remained the mainstream style until now. The rice-eating culture of this region has two systems: a ‘grain food culture’ in which rice grains are cooked as they are, and a ‘flour food culture’ in which rice is ground into flour and cooked, a cooking method common to that of crops cultivated before the arrival of rice. These systems coexist not because the native flour food culture was replaced by a grain food culture, but because rice was incorporated into the flour food culture. The agricultural technology and food culture of this region provide clues regarding the nature of rice cultivation and rice-eating culture that once existed, and the origins of modern rice-eating culture in East Africa.

**KEYWORDS:** Diffusion and acceptance; East Africa; Grain and flour food; Indian Ocean Rim; Rice-eating culture.

## INTRODUCTION

Tanzania is the largest rice producer in East Africa; when compared with other African countries, its production is the fifth largest after Madagascar, Egypt, Nigeria, and Mali (FAO 2020). Despite its growing rice production, Tanzania has not been able to meet domestic demand, forcing it to import rice from Asian countries, with the amount imported increasing every year. One reason for these imports is the rapid growth in rice consumption by the food service industry and consumers, owing to the increase in urban population (Kato 2008).

A visit to a local market will reveal Tanzania’s unique practices and preferences for rice. For example, many staple food crops, such as maize, sorghum, finger millet, and cassava, are sold at a uniform price without distinction by variety or production area. Rice, on the other hand, is displayed in grain bags according to

variety and production area and sold with a tag indicating the price and production area. Generally, long-grain varieties are referred to by their production area and sold at relatively high prices, while short-grain varieties are collectively called *mdundiko* and sold at a lower price.<sup>(2)</sup> Other factors that people consider when buying rice are the amount of broken rice and red rice in the grain, and the rice's aroma. The less broken rice and red rice, the stronger the aroma, and the higher the price (rice that is too broken can form dumplings when cooked and is considered poor quality). The whiteness of the rice is also important (red and white rice mix to form a brown color that is not preferred by consumers and lowers the value of the product). Additionally, while it is considered impolite for customers to smell the goods for sale in the market, rice is the only product that customers are allowed to smell in Tanzania; the store owner may even bring the rice to the customer's nose. Aroma is an important factor in determining the quality of rice; the aroma of cooked rice is favored across the country. In East Africa, cereals, including crops of African origin, are generally prepared by grinding them into flour before cooking, but rice is generally prepared as a grain after threshing and hulling.

These characteristics of rice trading in the market and rice consumption in restaurants and households are common in many cities. Furthermore, because the demand for rice is mainly concentrated in urban areas, rice, especially paddy rice, has become an excellent cash crop in Tanzania. However, in areas that remain out of the agricultural distribution channels due to geographical and social factors, rice is grown mainly for domestic consumption through shifting cultivation.<sup>(3)</sup>

In the hills descending from the Southern Highlands of Tanzania to the Kilombero Valley, Tanzania's major rice production area, there are many mountain villages whose main livelihood is shifting cultivation of rice (Culwick & Culwick 1935; Jätzold & Baum 1968). One such village is Ifinga, a remote village in the Ruvuma Region of southern Tanzania that is the focus of this study. In this village, various methods of cooking and processing rice were observed. This study describes the rice cultivation that supports the rice-eating culture of Ifinga village, and then compares rice cooking methods, cooking utensils, and food taste expression with examples from other regions to understand how rice cultivation and rice-eating culture in inland Tanzania were established, and how they are positioned in modern Tanzania. In addition, this study will focus on the spread and acceptance of rice cultivation and rice-eating culture.

## OUTLINE OF THE RESEARCH SITE

### I. Natural environment

In the southern part of Tanzania, where the Great Rift Valley meets the east and west, there are hills around 2,000 m high called the Southern Highlands of Tanzania (Figure 1). On the east side of the Southern Highlands of Tanzania is a steep slope that leads down to the Kilombero Valley, which is a hilly region. The Kilombero Valley has a vast flood plain and flows into the Rufiji River,

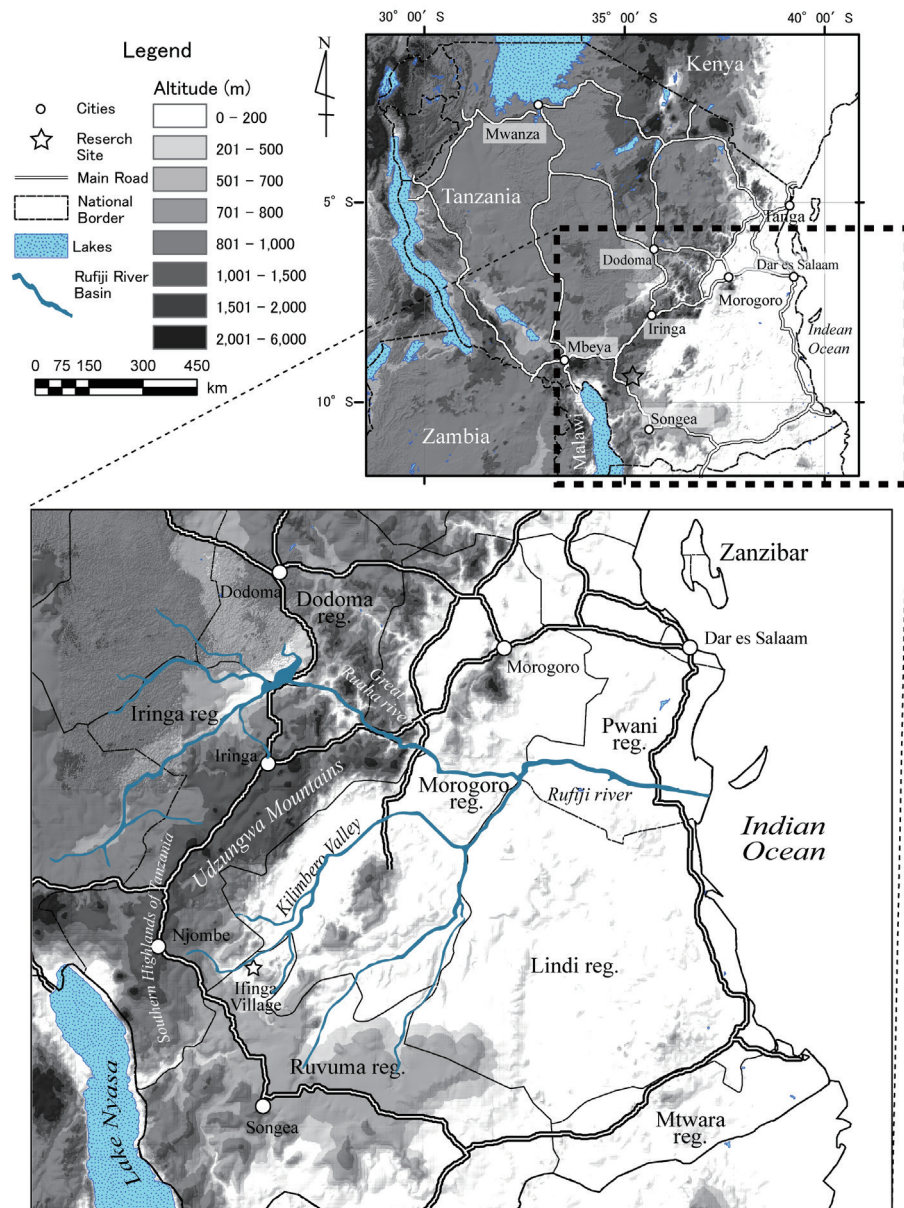


Figure 1 Location of the study site. Source: Prepared by the author.

Tanzania's largest river, which collects water from the surrounding areas, flowing south of Dar es Salaam into the Indian Ocean. The research area is located in rugged hills down the steep slopes of the Southern Highlands of Tanzania. These hills are dotted with the mountain villages of the Bena, Bantu farming people.<sup>(4)</sup> They have taken advantage of the varied topography and humid climate to grow rice and finger millet (Culwick & Culwick 1935; Monson 1991).<sup>(5)</sup>

Ifinga village, the site of this study, is one of these mountain villages, situated at an altitude of 350–900 m. It covers a vast area of about 55 km from east to west and 60 km from north to south. The settlements were scattered around this vast mountain area, but the inhabitants were forced to move to the present Ifinga village by the villagization policy that was implemented in the mid-1970s. Since then, they have settled in several administrative sub-villages<sup>(6)</sup> and have been practicing shifting cultivation in the mountainous area 20 km from east to west, and 20 km from north to south between the Ruhuji and Mwesa rivers.

The watershed of the Ruhuji and Mwesa rivers is divided into a series of small hills, about 50 m high, and the valleys are covered with wetlands (*ngapa*)<sup>(7)</sup> where grasses thrive. The stream originating from this *ngapa* forms a small river as it approaches the two rivers, eventually flowing into them. On the hilly slopes in the watershed area, a bamboo species called *mkokolombi* (unidentified) dominates, forming a bamboo forest. This bamboo community diminishes as it approaches the two rivers and eventually becomes a forest, comprising various tree species. The hilltops of this forest area are dominated by *Brachystegia spiciformis* (*mtebele*, *miombo*), a subfamily of the Fabaceae family, and a mixed forest is formed on the slopes. Rice cultivation in these uplands and valley wetlands forms the main livelihood of Ifinga village. In addition to farming, hunting and fishing are also practiced to obtain supplementary food and cash. The rice cultivation in the study area is detailed in Section 3.

## II. Ethnic society and history

In the center of Ifinga village, there is a Catholic church that was completed in 1931—the area around it is called Ifinga Mission, which is a settlement. The most common ethnic group residing here is the Bena (205 households), who account for about 86% of the total population. There are two groups of people referred to as 'Bena' in the village: those who mainly lived around Njombe at high altitudes, and those known as 'Bena Manga' who migrated from the highlands to the Kilombero Valley about 150 years ago (Swartz 2003). Both groups refer to themselves as 'Bena' to outsiders, and Swahili is used in their homes on a daily basis. There are, however, distinct differences in language, customs, and rituals between the two groups, and they make a clear distinction when talking about their origins within the village. It was at the end of the 19th century that the Bena Manga migrated to Ifinga village and established a chiefdom (Culwick & Culwick 1935). According to interviews, the Bena by that time had already migrated from the area around Njombe and were scattered throughout the mountains. The Bena Manga, who migrated with the chief, came to be regarded as the area's rulers. According to oral tradition, the Bena Manga brought rice

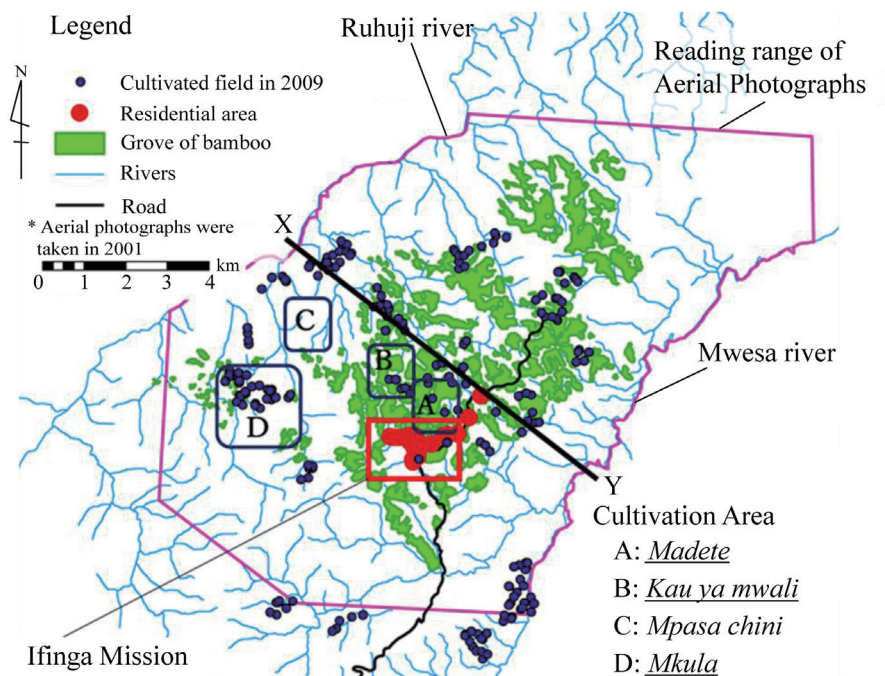
cultivation to the area. Though rice is the most important staple food today, Culwick and Culwick (1935) note that, in Ifinga village at that time, people ate a stiff porridge (*ugali*) of finger millet rather than rice.

Ifinga village is a remote village, which is an important regional characteristic. Longford (2001), who visited Ifinga village in 1959 just before Tanzania gained independence, noted that the inhabitants grew very few cash crops and mainly engaged in shifting cultivation for their subsistence. Compared with the rural areas near cities, the activities in Ifinga village are still largely subsistence-based.<sup>(8)</sup>

## RICE CULTIVATION

### I. Land use

The people of Ifinga village grow vegetables, fruit trees, and other crops on a small scale in the fields of their residential compounds and cultivate upland rice and other staple crops on the shifting cultivation fields in the hills outside the residential area. Shifting cultivation is carried out in the secondary forests that cover the hill slopes (*kidunda*). The vegetation of the secondary forest can be roughly divided into two types: bamboo forest, dominated by *mkokolombi* (a type of bamboo), and mixed forest with a variety of tree species. Figure 2 shows the



**Figure 2** Study area. Source: Compiled by the author based on field surveys.

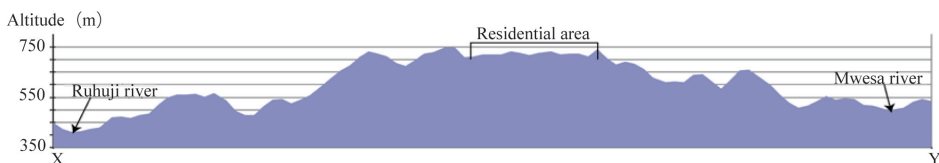
distribution of bamboo forests based on aerial photographs taken in 2001. It can be seen that the bamboo forest in *mkokolombi* is distributed only around the residential area centered on Ifinga Mission.

Figure 3 shows the topographic cross section at the X–Y line in Figure 2. Ifinga Mission is located at the point indicated as ‘residential area’ in Figure 3. The surrounding area is relatively flat, with a series of small hills and a wetland (*ngapa*) where grasses flourish in the valley. The water flowing from the wetlands eventually becomes small rivers—the Ruhuji River flowing to the northwest of the village and the Mwesa River flowing to the southeast. As they approach the rivers, the slopes become steeper and the valleys take on a V-shape, with few riverside wetlands.

In this study, the area near Ifinga Mission, where bamboo forest and wetland are mixed, is referred to as the ‘settlement periphery’ (or the ‘bamboo forest area’ when focusing on the vegetation), while the forest on its outer edge is referred to as the ‘forest area’. Figures 4 and 5 show typical landscapes of the ‘settlement periphery’ and ‘forest area’, and Figure 6 shows a schematic diagram of land use in both. In both areas, the top of the hill (*mtambo*) is not suitable for cultivation because it is a rocky ridge with exposed rocks in some places. The soil on the slope is relatively thick, and shifting cultivation is performed to grow upland rice, finger millet, sesame, maize, sorghum, cucumber, and tomatoes. Of these crops, only finger millet is grown via mono-cropping, while the others are mixed seeding with upland rice. Paddy rice is also cultivated in the wetlands at the valley bottom. The paddy fields in this area do not have ridges. These cultivated land areas in the valley bottom wetland are referred to as the ‘wetland field’ in this study.

The inhabitants of Ifinga village have fields either in the settlement periphery or in the forest area. If the field is close to the settlement, they can commute to work. If it is several kilometers further in the forest area, it takes a long time to get to and from the field. As a result, many people build a hut near the field and spend most of the farming season there. The land in Ifinga village is divided into small areas with a place name that is used to refer to the cultivated land. This group of cultivated fields with place names are called a ‘cultivation area’ in this study.

There are differences in rice cultivation between the settlement periphery and forest areas, each of which has a different ecological environment. Each household’s rice field area was surveyed in the *madete* (Figure 2, A, 21 households in 2007) and *kau ya mwali* (Figure 2, B, 16 households in 2009) cultivation area plots in the settlement periphery and in the *mpasa chini* (Figure 2, C, 9 households in



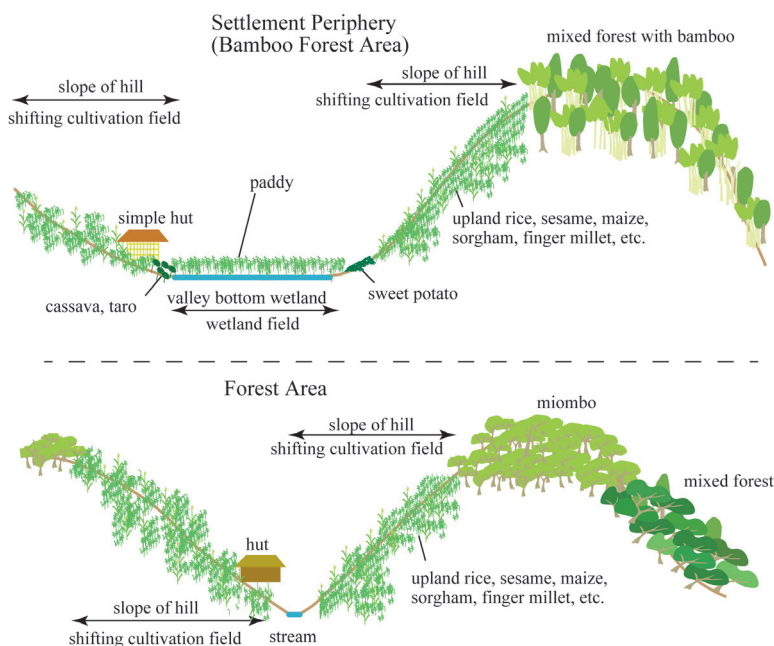
**Figure 3** Topographic cross section of the study area. X and Y correspond to the straight line; X–Y in Figure 2. Source: Prepared by the author.



**Figure 4** Landscape around the settlement periphery: bamboo forest area (Ifinga village, photo taken by the author on April 21, 2006).



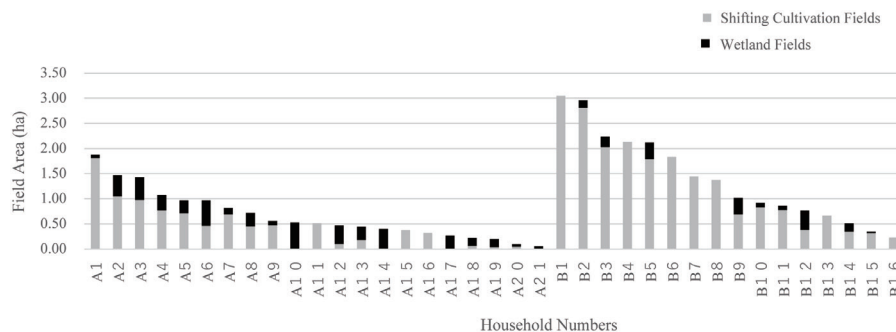
**Figure 5** Landscape of the forest area (Ifinga village, photo taken by the author on April 29, 2006).



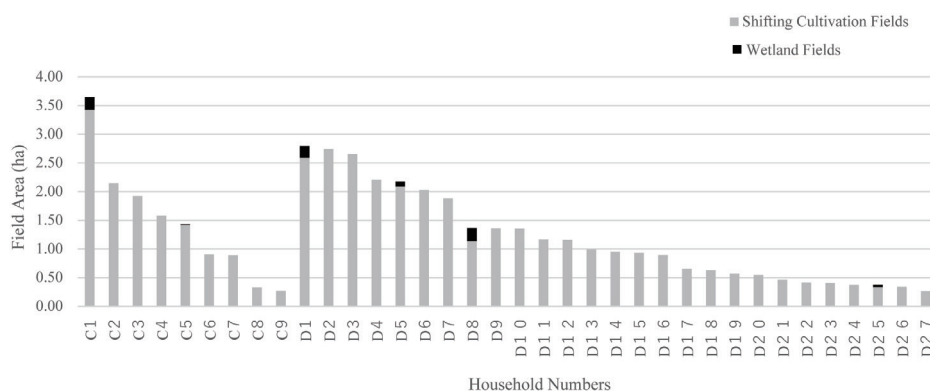
**Figure 6** Land use in the settlement periphery and in the forest area. Source: Prepared by the author.

2007) and *mkula* (Figure 2, D, 27 households in 2009) cultivation area plots in the forest area. Figures 7 and 8 show the accumulated area of shifting cultivation fields and wetland fields cultivated by each household in the cultivation area in the settlement periphery and the forest areas. Although there is variation in the area of fields cultivated by each household, many households in the forested areas, where there are few wetlands (*mpasa chini* and *mkula*), practice only shifting cultivation, while those in the settlement periphery (*madete* and *kau ya mwali*) practice both wetland and shifting cultivation.<sup>(9)</sup> Upland rice, the main crop of Ifinga village, is basically cultivated by shifting cultivation, while paddy rice is





**Figure 7** Field area (ha) of cultivation areas in the settlement periphery. Household numbers A1 to A21 are from *madete* cultivation area (2007 survey) and household numbers B1 to B16 are from *kau ya mwali* cultivation area (2009 survey). Source: Compiled by the author based on field surveys.



**Figure 8** Field area (ha) of cultivation areas in forest areas. Household numbers C1 to C9 are from *mpasa chini* cultivation area (2007 survey) and household numbers D1 to D27 are from *mkula* cultivation area (2009 survey). Source: Compiled by the author based on field surveys.

also cultivated if there are wetlands nearby.

## II. Upland and wetland fields

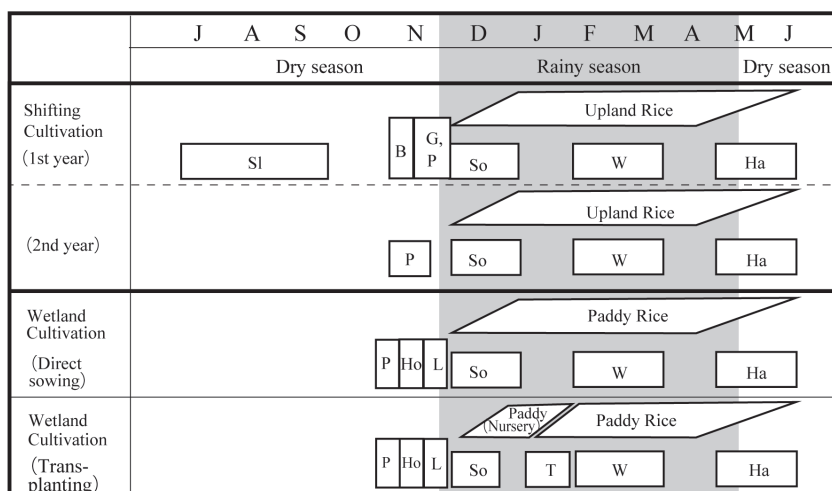
Figure 9 shows the agricultural calendar for rice cultivation in the study area. In this section, we clarify the logic of land use from the labor hours and yields required for agricultural work in the shifting cultivation and wetland fields. Because the work, from land preparation to sowing, differs greatly between shifting cultivation and wetland cultivation, these agricultural activities will be described first regarding upland rice cultivation in shifting cultivation fields followed by paddy rice cultivation in wetland fields. The subsequent weeding and harvesting will be described together.

### 1. Agricultural calendar

After two years of cultivation, the fields are abandoned, and the farmers move

to another forest to open new fields for cultivation. The first year of shifting cultivation fields is called *litema*, and the second and subsequent years of fields and abandoned land are called *lihala*. Cultivable land is described by the word *kigonela*, meaning ‘slept well’. People decide where to cultivate based not on the number of years the land has been fallowed, but on the presence or absence of certain weeds, the topography and fauna of the cultivated land, and the distance from the village. Once the cultivated land is selected, machetes are used to clear the undergrowth and axes are used to cut down trees and bamboo from early July to mid-September. The timing of the burning is decided by the men of the households cultivating the same area, based on the weather and the dryness of the fallen trees. Typically, the fires are lit all at once from the end of October to the beginning of November, when clouds appear more frequently. Thereafter, the remaining fallen trees and bamboo culms are collected and set on fire again. In the second year, the fields in *lihala* are cleared and crop residues are collected and burned around the beginning of November. Some households only cultivate the wetland in the same year as cultivating the *lihala*, as the clearing of the *lihala* is easier than that of the *litema*. Sowing is carried out between December and January, after the rains begin in late November and the soil is sufficiently moist. Seeds are scattered from the bottom of the slope to the top, and then covered with soil while weeding is done by scratching the surface of the soil with a hoe. The seed rice is scattered according to the variety, and at this time, the upland rice seeds are mixed with a small amount of maize, sorghum, pearl millet, okra, bitter tomato (*Solanum* sp.), tomato, and sesame seeds, among others.

The surface of the wetland is tangled with the roots of grasses, forming a thick



Sl: Slashing, B: Burning, G: Gathering, P: Preparing, So: Sowing, W: Weeding, Ha: Harvesting, Ho: Hoeing, L: Leveling, T: Transplanting.

**Figure 9** Agricultural calendar for rice cultivation. Source: Compiled by the author based on field surveys.

root mat. At the end of November, just before the rainy season, this root mat is stripped and cleared, dried for several weeks, and then burned. The hoeing of the wetland is done by digging deep into the soil while removing the residue. The field is then leveled and sown while breaking up the soil clods. Many households soak the seeds in water for a few days to germinate them and sow them directly, while others grow seedlings in nurseries and transplant them in late January, after the sowing of the shifting cultivation fields has been completed.

Approximately 50 rice varieties are grown in Ifinga village, although each household only grows around four varieties. People not only distinguish between upland and paddy rice, but also select rice varieties for planting each year based on cultivation-related characteristics, such as early and late maturity and drought resistance, as well as food quality and cooking characteristics. Additionally, in this region, continuous cultivation of the same rice variety is avoided because it is believed to lead to lower yields. This practice is one of the reasons for planting multiple rice varieties.

Weeding is done in February and March in both shifting cultivation and wetland fields. This practice takes the second longest time after the harvesting work. On slopes, weeds and sprouts growing around stumps are cut with a machete. In bamboo groves, branches regenerate and thrive from stumps, which are carefully cut down. In wetlands, weeds are mainly pulled out by hand; however, weeds such as *Ageratum conyzoides*, a member of the Asteraceae family, tend to thrive and become a major obstacle.

In Ifinga village, which is surrounded by forests, bird and animal damage is serious and can be devastating if left unchecked. Bird damage is most severe during sowing and just after ear emergence. Other wild animals that feed on rice include yellow baboons (*Papio cynocephalus*), velvet monkeys (*Cercopithecus pygerythrus*), cane rats (*Thryonomys* sp.), and wild boars (*Potamochoerus* sp.). Feeding damage continues from the booting stage until the end of harvest. However, when damage occurs frequently, monkeys are surrounded and killed with clubs, captured with leg-hold traps, or sniped with guns. Because cane rats and wild boars enter the wetland fields at night, the fields are generally enclosed with bamboo fences. The meat of these animals is edible, and so villagers intentionally leave gaps in the fence and set jump traps. Additionally, as the fields are adjacent to each other in the cultivation area, it is easy to monitor them and limit the entry routes of vermin.

Harvesting of early-ripening varieties begins in mid-April, but the peak harvest period is from mid-May to late June. Late harvesting results in increased harvesting work and harvest losses owing to broken necks and fallen plants. The shell of the giant African snail, a member of the Achatinidae family, is used for harvesting (Figure 10). The periphery of the shell is held in the right hand and pressed against the ear shaft. The shaft is then cut by pulling the shell up. The harvester holds the harvested ears of rice between the right thumb and the shell while continuing to cut the ears; when 10 to 15 ears have been accumulated, the harvester switches to the left hand. When the harvester finds ears that appear to be of a different variety, they are placed between the other fingers to avoid mixing varieties. If a variety other than the one sown is found, it may be saved and



**Figure 10** Harvesting with giant African snail shells (Ifinga village, photo taken by the author on May 2, 2007).

sown the following year. When the harvester's left hand is full, the bundle of ears is placed on the ground. The bundle of ears is called a *kipokoto* and is tied with a cord made of the bark of the linden shrub (*Triumphetta rhomboidea*) in such a way that the two *kipokoto* intersect. This bundle is called a *ng'anda*. The *ng'anda* is the basic unit for measuring the harvest. In the study area, many households set a target of 1,000 *ng'anda* for their annual harvest. The amount in a *ng'anda* varies depending on the size of each person's hand and the variety of rice, but one *ng'anda* is approximately 1.5 kg, which is equivalent to approximately 1.2 kg of unhulled rice or 0.8 kg of white rice (1,000 *ng'anda* is approximately 800 kg of white rice).<sup>(10)</sup>

The harvested ears are placed on a drying table (*kitandawalo*) for two to three weeks to dry in the sun. After drying, the ears are moved to grain storehouses (*kisanji*), with bamboo frames and clay walls for storage. Each *kisanji* can hold about 2,000 to 3,000 *ng'anda*.

## 2. The logic of land selection for cultivation

To understand how the villagers in Ifinga village use and select land for cultivation in the forest and bamboo forest areas, the labor input and yield in shifting cultivation and wetland fields are compared.<sup>(11)</sup>

Table 1 shows the rice yields in the first (*litema*) and second (*lihala*) year of shifting cultivation fields in the forest and bamboo forest areas, and the yields of rice in the first year of wetland fields. It should be noted that the fields selected for the *litema* of the forest were subjected to significant bird feeding damage, which may have resulted in a considerable yield loss. There was almost no difference in the yield between the *litema* in the forest and bamboo forest, but this was also due to bird damage, and the yield would have been higher in the *litema* in the forest area without such damage. According to the villagers, weeds tend to grow, and the yield decreases in the second year in both the forest and bamboo forest. In fact, the yield in *lihala* in the bamboo forest area was lower than that of *litema*, while the yield in *lihala* in the forest area was higher than that of *litema*. This could also be because the *litema* fields in the forest area were

**Table 1** Yield per hectare of representative varieties of upland and paddy rice

Rice type	Vegetation/ Habitat	Years of cultivation	Yield (t/ha)	Range (t/ha)
Upland Rice	Bamboo forest	1st	1.55	2.95–0.75
		2nd	1.15	2.00–0.65
	Forest	1st	1.52	2.90–0.45
		2nd	2.18	2.85–1.20
Paddy Rice	Wetland	1st	3.33	3.85–2.65

Dry rice was weighed after the crops are harvested, dried in the sun, and threshed. The crop is harvested in shifting cultivation fields (3 m × 3 m × 15 replications) in the first and second year, both in the bamboo and in the forest area, and in wetland fields (3 m × 3 m × 6 replications) in 2009. The upland rice variety, bangamoyo, is used in the shifting cultivation fields, and the paddy rice variety, india (direct-sown), in the wetland fields.

Source: Compiled by the author based on field surveys.

damaged by birds. On the other hand, the yield of the paddies grown in the wetland field was much higher than that of the upland rice grown in the shifting cultivation fields, in both the forest and bamboo forest area. Even considering the loss of yield due to bird damage, it is assumed that the yield per unit area is higher when paddy rice is grown in wetland fields.

In terms of field area (Figures 7 and 8), shifting cultivation in the forest area is by far the largest, while shifting cultivation in the bamboo forest area is about a half to one-third of it. The wetland field area is less than 10% that of shifting cultivation in the forest area. This is because, as mentioned above, clearing bamboo forests and cultivating wetlands requires more labor; in particular, shifting cultivation and wetland cultivation in bamboo forest areas are often conducted in pairs, resulting in a smaller cultivated area given the insufficient labor.

The average unhulled rice yield was calculated by multiplying that of shifting cultivation in the forest and bamboo forest areas, that of wetland cultivation, and the average cultivated area of households. Shifting cultivation in the forest had the highest yield at nearly 3 tons. This is more than double the 1,000 *ng'anda* (about 1.2 tons of unhulled rice yields) that farmers estimate is consumed in a year, indicating that a considerable surplus was generated in the survey year. The yields of the shifting cultivation and wetland fields in the bamboo forest area were low because of the limited cultivated area. However, if we assume that one household cultivates both of these fields, the annual yield target would also be exceeded.

Even though the yield per unit area of paddy rice cultivation under wetland cultivation was higher than that of upland rice under shifting cultivation, they are not as active in wetland cultivation, possibly because of the size of labor input. Therefore, we measured labor hours for each agricultural task, from field preparation to harvesting, for both shifting and wetland cultivation. We also calculated the labor hours per hectare when a single person performed the agricultural task

**Table 2** Amount of labor required for each operation of rice cultivation

Month	Shifting cultivation (1st year)		Wetland cultivation			
	Direct sowing		Direct sowing		Transplanting	
	Labor type	Labor input (h/ha)	Labor type	Labor input (h/ha)	Labor type	Labor input (h/ha)
July– September	Slashing (Undergrowth)	49				
	Slashing (Trees)	118				
November– December	Burning*	n.d.				
	Gathering & Preparing	52				
December– January	Sowing	193	Preparing	458	Preparing**	458
			Hoeing	460	Hoeing**	460
			Leveling	192	Leveling**	192
			Sowing***	n.d.		
January				Transplanting	471	
February– March	Weeding	288	Weeding	1,256	Weeding	500
April–June	Harvesting	513	Harvesting	513	Harvesting (Reaping)	266
					Harvesting (Threshing)	268
	Total	1,213	Total	2,879	Total	2,615

\* Burning is not carried out by one household alone but by a group of men from neighboring households. This process usually takes about two to three hours.

\*\* This work is common to that of direct sowing in wetland cultivation.

\*\*\* Scattering of germinated seeds. The amount of labor is negligible.

Source: Compiled by the author based on field surveys.

(Table 2). The results show that the labor time per hectare in shifting cultivation was less than half of that in wetland cultivation. Harvesting took the most time in shifting cultivation, while weeding took the most time in wetland cultivation. Because of the dense growth of Asteraceae weeds (*Ageratum conyzoides*) in wetland fields, the time required for weeding per area in direct-sown wetland fields was more than four times longer than that for shifting cultivation. Wetland cultivation also requires more time for clearing and hoeing, which is done from late November to late December. Even if farmers want to expand the wetland fields, it is not possible to do so because it takes a long time to prepare such fields.

According to the villagers, paddy rice has been cultivated in the wetlands in

this area for a long time, but the area under cultivation has increased only since approximately the year 2000. According to a GPS survey conducted in 2007, only 4.7 hectares, or 36%, of the 13.1 hectares of cultivable wetland in the *madete* cultivation area described in the previous section had been cultivated, leaving the wetland untouched. The market value of paddy rice is higher than that of upland rice, and its cultivation has increased as the market economy has penetrated the villages. However, households do not compete or confront each other over wetlands. Furthermore, there are few households in Ifinga village that want to specialize in paddy rice cultivation. Though they know that paddies can be planted with intensive labor input to reduce labor dispersal and weeding work if they build up the ridge and convert it into a paddy field, there is no movement to do so. Rather, they abandon the wetland fields as they move to shifting cultivation ones. Paddy cultivation has its advantages, but wetland cultivation requires high labor input, which reduces the cultivated area. This small area is not enough to cover household's annual consumption, and so they perform shifting cultivation to secure food for their consumption. When there is a surplus of labor, they cultivate the wetlands.

## RICE-EATING CULTURE IN IFINGA VILLAGE

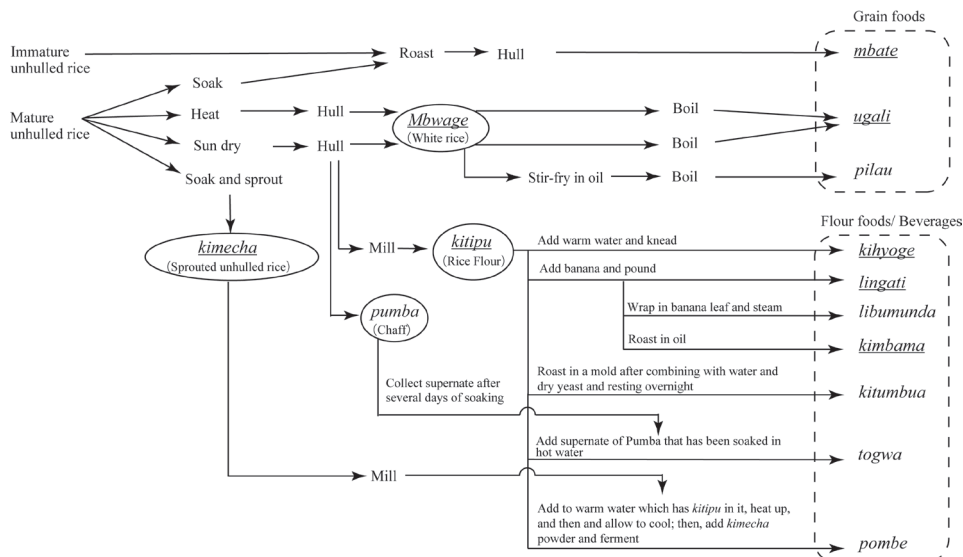
### I. Cooking and processing of rice

#### 1. Grain food dishes and rice-related material culture

Figure 11 illustrates the flow of cooking and processing methods for immature and mature rice. In Swahili, stiff porridge of maize or cassava is called *ugali*, and cooked rice is called *wali*. In Ifinga village, however, cooked rice is called *ugali*, and stiff porridge of maize or cassava is called *ugali wa kusonga*.<sup>(12)</sup> In this village, roasted maize is often eaten as a snack, but stiff porridge made with the flour of maize or cassava, which are widely used as staple foods in Tanzania, is not popular. People lament when they have only maize and cassava, saying that it is a *njaa* (famine).

Rice harvested before the end of the rainy season is difficult to dry in the sun, so the ears are threshed with a bamboo spatula and steamed in earthenware or pots before drying. The people of Ifinga village explain that they use this method because it makes hulling easier and reduces the amount of broken rice. This method is found in India as a type of threshing pretreatment, commonly known as parboiling. Nakao (1972) notes the parboiling process in India, speculating that it originated from the drying of immature rice, and points out the similarity between parboiling and the roasted rice known as 'chura' in India and 'yakigome' in Japan. He also speculates that the roasted rice found in Japan was introduced from India. In the study area of this research, there is a processing method for immature rice, *mbate* (roasted rice) and parboiling. In sub-Saharan Africa, a report indicates that it has been traditionally used in the northern part of Ghana (Shiratori 2008), but the details of its distribution are unknown.

For cooking, the rice is first washed with water to remove the husk and bran,



**Figure 11** Flow of cooking and processing of rice. Source: Compiled by the author based on field surveys.

then boiled in water and a little salt. Occasionally, cooking oil is added. Approximately 900 g of rice requires 1.5 liters of water. As upland rice needs more water in cooking than paddy rice, paddy rice and upland rice are not cooked together. It is simmered over high heat for approximately 10 minutes without a lid and stirred occasionally to prevent burning. Subsequently, the heat is lowered by reducing the amount of wood, and the surface of the rice is flattened. The pot is then covered with a lid and simmers over low heat for 6–10 minutes. During this period, banana leaf blades or leaves of *Annona senegalensis* (*mdopidopi*), a member of the Annonaceae family, are gathered. All firewood is then removed, and the banana and other leaves are spread over the rice in the pot to fill the gap between the lid and the pot. The pot is thus sealed. Hot embers are then placed on top of the lid, and the pot is heated from below by the residual heat from the ground and stones, while it is steamed from the top of the lid (Figure 12). Rice is cooked in this state for approximately 30 minutes.

In Ifinga village, an earthenware lid with a warped edge is used to make it easier to place hot embers on the lid. This type of pot lid is found in some parts of Tanzania. In Zanzibar, where rice is also a staple food, the same type of lid is widely used (Figure 13), providing a glimpse of the influence of the Indian Ocean coastal region and even the Arab world on Ifinga village's rice-eating culture.

Other cooking utensils are also unique to rice-eating regions. In Tanzania, a wooden spatula is used to prepare and serve the main and side dishes. In areas where the staple food is *ugali*, it is important to knead the grain flour so that it does not become lumpy. Unlike the spatulas widely distributed in Tanzania, the spatula used in Ifinga village is shaped like a wooden spoon. This is because the





**Figure 12** Cooking rice: heating from the top on the lid (Ifinga village, photo taken by the author on February 4, 2007).



**Figure 13** Pot lids sold at a market in Zanzibar (Pemba Island). Photo courtesy of Professor Juichi Itani, Kyoto University.



**Figure 14** Rice scoop and spatula. In the photo, (1) is a utensil used in Ifinga village, and the right end is used as a rice scoop and the left end as a spatula; (2) and (3) are a rice scoop and a spatula sold by a street vendor in the suburbs of Dar es Salaam.

neck of the spatula has a large bend to make it easier to scoop cooked rice out of the pot and serve it (Figure 14). This distinction between rice scoopers and spatulas is also found in other areas. In comparison, the spatulas and rice spatulas obtained in the suburbs of Dar es Salaam are similar in shape. However, the spatulas have a slight indentation in the neck to facilitate the scooping of the cooked rice.

When eating, rice is served on a large plate and a small bowl of side dishes is placed in the center of the plate. The side dishes should have less liquid if they are vegetable dishes and more liquid if they are meat and fish dishes. Vegetable dishes consist of a variety of leafy vegetables from the garden (cassava,

sweet potato, pumpkin, amaranthus, etc.), okra, and bitter tomato cooked with tomatoes, with crushed groundnuts and sesame seeds sometimes added. During the rainy season, mushrooms collected from the forest or shifting cultivation fields are also frequently eaten. In the case of vegetable dishes, each person takes some amount of rice and mixes it with the vegetables, then grasps a mouthful and throws it into their mouth. When the rice is too sticky and sticks to the hand when held, it is called *kamata*, which is said to be caused by the characteristics of the rice variety or the cooking method. However, when the rice grains stick together, it is called *shikana*. Rice varieties and cooking methods that allow the grains to stick together properly are highly regarded. In the case of meat and fish dishes, the rice is either dipped in the meat or fish broth, or only the broth is sprinkled over the entire rice. After eating some of the rice with the soup, the meat or fish is eaten little by little. The ‘scorched rice’ that sticks to the bottom of the pot is called *ukoko*, and eating it is a matter of individual preference. At breakfast, leftover rice from the night before is sometimes reheated. This rice is called *kiporo*.

In Ifinga village, there is a fermented seasoning called *siki*. Each family has its own way of making it. In general, it is made by dissolving red pepper, salt, and roasted nuts or groundnut paste in hot water, packing it in a jar, and exposing it to the sun for several days. Sprinkled over rice, it adds a spicy and sour taste to the rice, making it more palatable. It is not clear whether fermented seasonings are also used in other regions. Therefore, this study treats *siki* as an ethnonym, but *siki* is a Swahili noun meaning ‘vinegar’ or ‘soured’.

A special dish that has recently been brought to Ifinga village is *pilau*. This is a dish of Arab origin made by frying spices, onions, garlic, meat, and rice in oil and then cooking them in a pot. *Pilau* is commonly served in urban eateries, but in Ifinga village, where the use of onions and spices is not customary, it is served at special banquets such as weddings.

Rice is also processed into beer and snacks in addition to being consumed as rice. The most common way to eat rice other than cooked rice is called *mbate*,



**Figure 15** Cooking of *mbate* (Ifinga village, photo taken by the author on June 16, 2007).



**Figure 16** *Mbate* (Photo taken by the author on December 4, 2006).

which is very similar to the Japanese roasted rice (yakigome) and Indian chura reported by Nakao (1972). The paddy rice is threshed when it is still green and not fully ripe, roasted over a high flame, and then immediately pounded with a pestle and mortar to remove the husk, producing *mbate* (Figures 15 and 16). The sound of pounding *mbate* can be heard from many places in the early stage of the harvest when immature rice is available. In addition, it requires less time and effort to prepare than rice cooking; therefore, it is sometimes used to entertain sudden guests. It is also used as a portable meal when traveling because it is not easily damaged and is filling. It is equally popular as a snack in the Kilombero floodplain, one of the most important rice-growing areas in Tanzania, under the name *pepeta* (Kato 2014). A study also mentions roasted rice in Madagascar (Maeda 1989).

## 2. Flour food dishes

In Ifinga village, rice flour is called *kitipu*, and there are several snacks made from it. *Kihyoge* is a porridge made by kneading rice flour with boiling water; however, it is rarely cooked, except as baby food (Figure 17). When banana is added to the rice flour and pounded, it becomes a snack called *lingati* (Figure 18). The banana acts as a ‘binder’ and also adds sweetness. *Lingati* is eaten raw, but there are several snacks cooked from it. For example, *lingati* wrapped in banana leaves and steamed in a pot or in hot ashes is called *libumunda* (Figure 19). The *libumunda* is described in the following two documents. The first is a collection of Zanzibari folk tales recorded by Steere (1870), in which a slave who accompanied a prince on his way to defeat a monster ate a confection called ‘*bumunda*’<sup>(13)</sup> as his portable food on the way. In the notes to this collection, *bumunda* is described as follows, “*Bumundas* are a soft kind of cake or dumpling made of *mtama* meal” (Steere 1870: 501). This suggests that *bumunda* existed in Zanzibar by 1870 at the latest, and that sorghum (*mtama*) was used as a raw material. The other word is listed as a headword in the Tanzanian national language dictionary, *Kamusi ya Kiswahili Sanifu* (Taasisi ya Uchunguzi wa Kiswahili 1981). According to this dictionary, it is a pastry made by mixing ripe banana with sorghum flour and baking it in oil. In Ifinga village, steamed *lingati* is called *libumunda*, and a snack made by rolling out *lingati* dough and frying it in oil is called *kimbama*<sup>(14)</sup> (Figure 20). In southern Tanzania, *kimbama* is generally made with maize flour and ripe bananas.

In summary, the steamed snack, known as *bumunda* in Zanzibar in around 1870, is the *libumunda* of Ifinga village; whereas, the deep-fried snack called *bumunda*, described by Taasisi ya Uchunguzi wa Kiswahili (1981), is equivalent to the *kimbama* of Ifinga village. Sorghum is often used to make *bumunda* and maize is used to make *kimbama*, but in Ifinga village, rice flour is used for both. The cereal grains used for the ingredients differ from region to region, but rice flour was likely used instead of sorghum or maize flour in Ifinga village when the snacks were introduced.

*Kitumbua* is made by fermenting rice flour with water and commercially available dry yeast, then baking it in an iron mold (Figure 21). It is sometimes sold as a light snack on the streets on Sundays. This snack is also found in other parts of



**Figure 17** *Kihyoge* (Ifinga village, photo taken by the author on April 10, 2009).



**Figure 18** *Lingati* (Ifinga village, photo taken by the author on June 16, 2007).



**Figure 19** Cooking process of *libumunda*. (Ifinga village, photo taken by the author on November 19, 2008). Wrap the *lingati* in banana leaves (left), add it to a small amount of boiling water, cover it, and then steam it (center). The finished *libumunda* is on the far right.

Tanzania, and there is a similar snack made in Madagascar. The custom of using dry yeast, however, had never existed in Ifinga village before, so it is thought to have been introduced recently.

Sometimes, alcoholic beverages are brewed from rice. People drink *pombe*, made from maize, daily; however, rice beer is more popular. The rice beer is made from *kitipu* and *kimecha* (flour made from unhulled rice and/or finger millet which are germinated, dried, and ground into powder). *Lishimika* which is a mixture of *kimecha* and hot water is used to saccharify the starch of *kitipu*.

The reason beer is made from rice flour rather than rice grains must be because brewing in this region originally used finger millet flour. It is also common to dissolve rice flour or rice germination seed powder in water and drink it as a soft drink called *togwa*.



**Figure 20** Cooking in *kimbama* (Ifinga village, photo taken by the author on November 19, 2008).



**Figure 21** Cooking in *kitumbua* (Ifinga village, photo taken by the author on July 14, 2007).

## II. Designation of the dish

When the names of the rice dishes and processed products in Ifinga village, described in Section 4.1, and the corresponding Swahili words were compiled, it became clear that five of the 10 names were mentioned in Taasisi ya Uchunguzi wa Kiswahili (1981), and three had corresponding Swahili words (Table 3). Table 3 shows that words are either isomorphic to Swahili or have Swahili counterparts for many rice dishes and processed products in Ifinga village. This fact suggests that the cooking and processing methods prevalent in Ifinga village exist elsewhere. However, even with the same designation, the cereals used as raw materials may vary from region to region, as in the case of *bumunda* and *kimbama*.

According to Kato (2014), rice flour porridge is also eaten in the Kilombero Valley and referred to in Swahili as *ugali*. In general, the cooking method is the same as for *uji*, which is thin rice porridge consisting of mixed grains, including finger millet. *Uji* is cooked all over Tanzania. Furthermore, regarding the snack known as *bumunda*, it was also made in Zanzibar using sorghum. The fried snack known as *kimbama* is common in the southern areas of Tanzania but is usually made with maize flour and banana. Regarding alcoholic/non-alcoholic beverages, more research is necessary. Nevertheless, common to the production methods of maize and finger millet germinated grain alcohol is the use of germinated rice as a raw ingredient. Notably, red rice varieties were cultivated for flour in Kilombero Valley in the past (Kato 2014); however, in Ifinga village, it is common knowledge that larger-grained varieties are good for yielding flour. Currently, red rice varieties and larger grained varieties are cultivated specifically for flour.

## III. Expression of food taste

In Ifinga village, Swahili is used to describe food taste. For example, there are several expressions for the taste of rice, such as *vimba* (swells well when cooked),

**Table 3** Correspondence between rice dish names in Ifinga village and Swahili

Type of food	Name in Ifinga (raw materials)		Names of dishes and processed products	Swahili*
Grain foods	<i>ugali</i>	(rice)	cooked rice	<i>wali</i>
	<i>mbate</i>	(rice)	roasted rice	<i>pepeta</i>
	<i>pilau</i>	(rice)	pilaf	<i>pilau</i>
Flour foods / Beverages	<i>kihyoge</i>	(rice)	rice porridge	<i>uji</i>
	<i>lingati</i>	(rice, banana)	snack made from raw rice flour and banana	—
	<i>libumunda</i>	(rice, banana)	steamed <i>lingati</i>	<i>bumunda</i>
	<i>kimbama</i>	(rice, banana)	fried <i>lingati</i>	—**
	<i>kitumbua</i>	(rice, dry yeast, suger)	baked snack made with fermenting rice flour and suger	<i>kitumbua</i>
	<i>pombe/ugimbi</i>	(maize, rice, finger millet etc.)	alcoholic beverage	<i>pombe/ugimbi</i>
	<i>togwa</i>	(rice)	soft drink	<i>togwa</i>

\* As described in Taasisi ya Uchunguzi wa Kiswahili (1981)

\*\* Taasisi ya Uchunguzi wa Kiswahili (1981) does not mention it, but in southern Tanzania, a snack made from maize flour and banana is called *kimbama*.

Source: 'Names in Ifinga [raw materials]' and 'Names of dishes and processed products' are based on field surveys by the author.

*lainika* (cooks softly as if cooked with oil), *nukia* (fragrant when cooked),<sup>(15)</sup> and *shikana* (holds together well when held in the hand). In Ifinga village, there are various indigenous rice varieties, and their eating quality is described by a combination of the above words. According to the findings from the interviews, 'well-swelled' rice is more common in upland rice, while 'softly cooked' rice is more common in paddy rice. The 'well-swelled' variety is preferred by households with many children and in times of food shortage because it gives a feeling of satiety. On the other hand, 'softly cooked' rice is one of the indicators of good eating quality. Few households eat 'softly cooked' rice regularly because it does not expand much when cooked. In addition, 'soft cooking' is not related to the amount of water used, but rather is an inherent characteristic of the variety. As is common throughout Tanzania, rice that is soft due to its high water content (*ubwabwa*) is not preferred. It is generally believed that 'swelling well (when cooked)' and 'cooking softly (as if cooked with oil)' are contradictory characteristics. Cooking methods differ slightly depending on the characteristics of the rice, and so rice with different characteristics, such as paddy and upland rice, are never cooked together. The people of Ifinga village are sensitive to the subtle differences in the taste of rice, owing to variety and cooking method and say, "We get bored with just the same rice (variety)."

The people of Ifinga village eat rice as their staple food throughout the year. Old rice that has been harvested for more than a year is called *mlovela*, while new rice is called *mpunga mpya*. *Mlovela* is not used as seed rice because it is considered difficult to germinate. It is also believed that if old and new rice are mixed and cooked, “birds will fly into the fields,” or in other words, “birds will harm the rice.” Accordingly, they either continue to eat the old rice until the stock runs out, or, if they feel like eating the new rice, they cook it separately. They never mix the two, however. They prefer new rice, and when the harvest season arrives, they express their joy by saying, “It looks like we’ll be able to celebrate Easter with new rice this year.”

While there are a variety of food taste expressions for grain foods, no such expressions were found for flour-based foods. People do not think that the taste of flour-based foods change depending on whether the raw material is paddy rice or upland rice.<sup>(16)</sup> Furthermore, it can be assumed that flour-based food is one method for consuming old rice, which is considered to have poor taste. Despite that, flour-based food and drink are made all year round and not necessarily to process old rice.

## DISCUSSION

### I. Diffusion and acceptance of rice cultivation

In Ifinga village, upland rice is cultivated in shifting cultivation fields on valley slopes, and paddy rice is cultivated in wetland fields on the valley floor. How were these two types of rice cultivation diffused and accepted in Ifinga village?

Based on the history of trade with the Arabs and South Asia, Carpenter (1978) estimated that Asian rice spread to East Africa approximately 2,000 years ago. According to Lu and Chang (1980), Asian rice was introduced to East Africa from the Arabs and South Asia via Madagascar. In any case, Asian rice and rice cultivation from the Arabs, South Asia, and Madagascar were repeatedly brought to the coastal areas of East Africa through Indian Ocean trade for many years. The spread of Asian rice inland led to the formation of rice-growing areas in various regions. For example, caravan trade, which traveled westward from the Swahili coast to what is now the eastern part of the Democratic Republic of Congo, brought rice cultivation from the coast to the interior. According to Meertens *et al.* (1999), caravan traders introduced rice cultivation to Sukumaland in southern Lake Victoria, which is now a major rice-producing area.

Monson (1991) indicates that a trade network had developed by the early to mid-19th century at the latest, between the villages of the Kilombero Valley and the mountain villages surrounding the flood plains where trading in rice, dried fish, salt, iron products, small livestock, clothing, and beads occurred. After the Bena Manga chief moved to Ifinga village at the end of the 19th century, Ifinga’s involvement in this trade network became stronger. Under these circumstances, it is assumed that rice cultivation from the Swahili coast spread to the inland villages of the Kilombero Valley and to Ifinga village.

Rice is mix-cropped with cereals (except finger millet) and vegetables in shifting cultivation plots of *litema* or *lihala*. On the other hand, paddy rice is grown as a single crop in wetland fields. However, it is clear from interviews with elderly people that the use of the wetlands was not common until very recently.

Judging from the fact that upland rice cultivation is the mainstream of rice cultivation in Ifinga village today, and that there are still technical issues, as well as environmental conditions, for the expansion of paddy rice cultivation, it can be assumed that upland rice was first diffused and accepted in Ifinga village. Thereafter, upland rice may have gradually spread as a staple food crop and replaced minor grains as the main grain. Mixed cropping, in which cereal and vegetable seeds are mixed, is an indigenous farming method that is still practiced in the study area today. It is thought that when rice cultivation spread to the village, this farming method served as a means for the acceptance of upland rice seeds.

On the other hand, in contrast to upland rice cultivation, paddy rice cultivation diffused as a new method that was technologically distant from conventional agriculture. The way it was accepted was completely different from that of upland rice. For example, cultivating wetland fields requires more intensive labor in the early stages of cultivation than shifting cultivation fields, and weeding in wetland fields is a greater burden than in shifting cultivation fields. Even if people want to cultivate paddy rice, they may not be able to do so because the wetlands suitable for paddy rice cultivation are unevenly distributed in the region. Hence, it is not possible to ignore the fact that the natural environment and the characteristics of local livelihoods inhibit the expansion of wetland fields. Nonetheless, people cultivate paddy rice, even on a small scale, for a number of reasons: to supplement their yields, as paddy rice has a higher yield than upland rice; to ensure diversity in food culture by growing rice varieties with different tastes; and because paddy rice sells at a slightly higher price than upland rice. A wide variety of rice varieties are grown in the study area. Seeds of such rice varieties are available within the region through equal volume exchange. This ease of access to seeds has encouraged households to adopt paddy rice cultivation on a trial basis. Paddy rice cultivation has been attempted, owing to a combination of local socioeconomic trends and the tendency of people to seek fulfillment and enrichment in their dietary life and food culture. Thus, both upland and paddy rice spread through human migration and trade, but the processes of their diffusion differed.

## II. Characteristics and diffusion of a rice-eating culture in the study area

In this study, the characteristics of the rice-eating culture in Ifinga village were delineated through the description of cooking and processing methods, cooking utensils, and taste expressions for rice.

The rice-eating culture of Ifinga village can be divided into two systems. The first is a grain food culture in which rice grains are cooked as they are. This includes staple foods, such as cooked rice, *pilau*, and roasted rice (*mbate*), as well as parboiling. Additionally, specially shaped pot lids and rice scoops present



a material culture corresponding to grain foods. The second is flour food culture, where rice is ground into flour before cooking. This is a method of cooking staple crops that are native to Africa, such as finger millet and sorghum, as well as maize and cassava originating from the New World. Flour-based foods include *kihyoge* made with rice flour, snacks made with rice flour and bananas, and alcoholic/non-alcoholic drinks.

Through inter-regional comparison, it was noted that the rice-linked food and material culture of Ifinga village has many similarities with the rice culture of the Swahili coast and the Kilombero Valley, some are also common to the Indian Ocean Rim region. Both the grain food and flour food cultures of rice in Ifinga village share many cooking and processing methods, as well as the names of dishes and processed foods, with other regions of Tanzania (Table 3). For example, similar or identical rice cooking methods to those of other regions include *pilau*, which originated in the Arab world, and *kitumbua*, which uses dry yeast to let the dough rise. These have recently been introduced to Ifinga village from urban areas. Roasted rice (*mbate*) is also common in some regions of the Indian Ocean Rim or the Kilombero Valley, but is rarely seen in other parts of Tanzania. It is reasonable to assume that this was introduced to Ifinga village through trade from Kilombero Valley, which is an older rice-growing area. However, rice flour was also used in Ifinga village for cooking and processing products that are commonly made with cereal flour in other villages.

In light of this, how did grain and flour food preparation methods spread? There are two possibilities. One is that these methods were introduced as a rice-eating culture, and the other is that they existed in Ifinga village before the introduction of rice as a cereal food culture but were applied to the rice-eating culture later. In any case, the indigenous flour-food culture was not replaced by the grain-food culture, rather rice was incorporated into it, and the two systems of grain-food and flour-food now coexist.

The rice-eating culture of Ifinga village can be inferred from the fact that rice cultivation was introduced to Ifinga village from the Kilombero Valley, given that the route of rice diffusion was essentially westward from the Indian Ocean. However, as mentioned earlier, Monson (1991) notes that trade networks had developed in the Kilombero Valley and surrounding mountainous areas by the early to mid-19th century at the latest. Within such a trade network, local food culture was not only diffused in a single line, but was also formed through the network, influencing each other based on complex factors. Furthermore, the present village of Ifinga can be positioned as one of the intersection points between the two food cultures of the Bena and the Bena Manga who migrated from the Kilombero Valley, and the food cultures brought from the cities.

The rice-eating culture of Ifinga village is a product of the historical relationship between urban and rural areas in terms of human traffic and trade, including cooking methods, material culture, taste preferences, and the use of the Swahili language to express tastes. In this context, the spatiotemporal expansion of rice culture in Tanzania is evident. The rice-eating culture of Ifinga Village provides clues to the nature of the rice-eating culture that once existed in East Africa and the origins of today's food culture.

## CONCLUSION

In this study, I have examined how rice cultivation and rice-eating culture spread to the remote villages of shifting cultivators in southern Tanzania and how it was received by local communities. It is thought that some of the rice-eating culture seen in Ifinga village today spread from villages in the Kilombero Valley, where there were trade relations before the Bena Manga brought rice cultivation and upland rice. In addition, when paddy rice cultivation was adopted, food quality played an important role. In Ifinga village, both upland and paddy rice have their own unique taste expressions. Because the taste of paddy rice was different from upland rice and sometimes was better suited to the preferences of the villagers, paddy rice cultivation was accepted even though it required greater labor input than upland rice cultivation.<sup>(17)</sup>

Combining several farming systems is not an easy task and maintaining a number of crops and crop varieties requires time and effort. Nevertheless, bananas, potatoes, and cereals are still grown in Ifinga village despite the rice-based diet. New rice varieties have also been brought to Ifinga from other areas, and the number of varieties grown is increasing. Furthermore, rice preparation and processing methods introduced from urban areas are being trialed, while snacks that are no longer produced in other areas are still being produced in Ifinga village. Thus, the internalization of foreign technology and the retention of native technology and knowledge in local communities can be identified in various aspects of production and consumption. This orientation results in diverse local farming and eating habits. The meaning and role of diversity for individuals and communities will be discussed in a separate paper.

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## NOTES

- (1) This paper is a translation and revision of the Japanese paper cited here: Harako (2021).
- (2) This *mdundiko* swells well when cooked and is offered in a simple cafeteria..
- (3) Kanyeke *et al.* (1995) classified Tanzania’s rice ecosystems at that time to show the percentage of area under cultivation. According to the study, paddy fields with irrigation systems accounted for only 6% of the total cropped area, and rainfed lowland rice cultivation was the largest at 74%. This indicates that Tanzania has many wetlands and

flood plains and that such wetlands are the main source of rice production. On the other hand, upland rice cultivation accounts for 20%, with shifting cultivation accounting for 12% of that.

- (4) The origin of the Bena ethnonym is *hu-bena*, which means “to cut ears of finger millet.” According to Kondo (2011), along with maize, finger millet is still an important staple food crop in Bena society in the Southern Highlands of Tanzania.
- (5) The rainy season in this area is from the end of November to the middle of May, and Ifinga village, the study site in this research, receives about 1,600 mm of rainfall during this period.
- (6) Tanzania’s administrative divisions are regions, districts, divisions, villages, and sub-villages. Currently, Ifinga Village consists of seven sub-villages. In this study, the areas where people live within these administrative villages are referred to as ‘residential areas’.
- (7) In this study, when writing local names, Swahili is italicized, and the ethnic languages used in the study area (Bena and Bena Manga) are underlined and italicized without further distinction.
- (8) When cash is needed, it is not easy to exchange agricultural products for cash in the village. To exchange agricultural products for cash, they have to carry goods on their heads on foot along a 50 km mountain road.
- (9) Normally, households do not cultivate more than one cultivation area. Even when households cultivate hill slope and wetland in the same cultivation area, they cultivate the land so that the shifting cultivation field and wetland field are in one continuous area.
- (10) In the study area, there are many nuclear family households consisting of a couple and a child/children. For example, a household consisting of two adults and one child cooks about 800 to 900 g of white rice twice a day, based on observation. Thus, the maximum amount of white rice cooked in a day is 1.8 kg, which is consumed in three meals. If this ratio is converted into a year, it is estimated that 657 kg of white rice is needed.
- (11) In a rigorous discussion of land selection, it is necessary to also mention, for example, the social relations and customary laws of land tenure. These are omitted here for the purposes of this paper.
- (12) In the study site, as in Swahili, the word *ugali* is sometimes used to mean staple food or simply a meal. However, the word *wali*, which means rice in Swahili, is not used at all, and the word *ugali* refers to rice. *Ugali wa kusonga* means kneaded *ugali*.
- (13) *Libumunda* is the singular form of *bumunda*.
- (14) In southern Tanzania, several ethnic groups refer to a similar fried snack as *kimbama*.
- (15) In Swahili, a clear distinction is made between ‘*nukia*’ and ‘*nuka*’, either positive or negative. The smell of rice, described as *nukia*, is desirable to many Tanzanians. In Ifinga village, the words *nukia* and *nuka* are used to describe the smell in the same way as elsewhere. The expression ‘fragrant (when cooked)’ refers to the aroma of the rice when it is cooked and when it is finished. The smell is generally favorable, but it is sometimes described as “a smell that makes women with morning sickness nauseous” or “a smell that makes neighbors aware that rice is being cooked.
- (16) Rice varieties with large grains, whether paddy or upland rice, are considered “suitable for flour foods” in the study area. Upland rice varieties that have the property of swelling well when cooked are also considered suitable for flour foods.
- (17) When I started my research in this village in 2006, paddy rice was sometimes described as “a favorite of buyers” or “a high seller.” However, paddy rice was first introduced much earlier than that, when it was grown exclusively for subsistence. What motivated the cultivation of paddy rice was not its economic superiority, but the difference in taste between paddy and upland rice.

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