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The Agriculture Complex and Ethnic Identity of the Duru

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This essay attempts to clarify the cultural complexity of agriculture which may be an effective index of ethnic identity using standard ethnological methods. The description is based on the field survey of the Duru of North Cameroon, that was conducted for three months in 1969-70 and one month in 1971. The main cultural elements of agriculture among the Duru include (a) crop composition, (b) agricultural techniques, (c) tools, and (d) calendar. These four elements are basic to agriculture, linking with other aspects of Duru culture, e.g. preparation of meals, economy, material culture and seasonal lifestyle.

INTRODUCTION

The purpose of this investigation is to consider the question of cultural complexity of agriculture as an example of a kind of sub-culture within the realm of culture as a whole, using as specific reference the Duru people who live in northern Cameroon. To state it another way, by describing farming culture as a sub-culture within an entire cultural framework, one is provided with a method for dealing with culture as a whole.

Previously, this writer has presented several papers on the agriculture of the Duru people [HATA 1972, 1973, 1976]. Nevertheless there are many reasons why he has come to concern himself with this specific problem mentioned above.

The first reason is that during the 1960's the importance of research into the origins of agriculture in tropical Africa, or rather ethnological legalistic accounts as part of cultural historical research, became generally recognized. Strictly speaking, studies in plant origins (plant cultivation) should not be equated with studies in the origins of agriculture. The most recent research into this field has included a collection of essays, "The Origins of African Plant Domestication" which considered the above two viewpoints [HARLAN, DE WET, STEMLER, (ed.) 1976]. These two aspects of research naturally have complementary characteristics, but this writer, strongly interested in African cultural history, feels closer to the latter, that is to say, the view of agriculture as part of the cultural complex. Such an approach points to the importance of the concept of farming culture as part of the methodology of cultural history. As a cultural historical fact, the propagation of agricultural techniques,

specifically in regards to agricultural implements and farm crops, becomes a valid issue for study. At such times, it is, of course, not sufficient to consider the transmission of only one element of farming culture. One must sufficiently analyze the structure of cultural complexity of agriculture as a sub-culture, and treat each ethnic group individually. For example, the names of farm crops are important data but it is not enough to list them merely as vocabulary. Names which make up a part of folk taxonomy are necessary for a description of the sub-system. The transmission of cultural elements requires a consciousness of ethnic involution. If one follows this line of thought in research concerning African cultural history, the concept of cultural complexity of agriculture becomes an important sub-system of the culture as a whole.

Secondly, this writer wishes to stress the differences between geographical and ethnological methods in cultural historical research. In "The Origins of African Plant Domestication" previously cited, Harris makes extremely diverse suggestions [HARRIS 1976]. In this paper, since one is concerned with the system of crop selection, one cannot help but say that this research has certain limitations. One may dare say Harris' methods are geographical, as is clear from his explanation of farming culture as a geographical structure. Such an attempt to explain cultural facts is extremely dangerous. In this paper, the writer's objective to go above and beyond geographical methods and to describe things using ethnological methods is based on this belief. There is a great difference between whether one looks at plant distribution simply from the viewpoint of where the plants are found growing on the surface of the earth or whether one looks at it from the viewpoint of the distribution of the ethnic cultures of those people who grow such plants. These differences increase if one considers the distribution of cultivation systems. Concerning this distribution, it is an extremely difficult task to differentiate between one system and another. But if one looks at the distribution of human beings, the boundary becomes more obvious. For this reason as well, the writer in using ethnological methodology wishes to emphasize the concept of farming culture as a cultural system.

A third reason is to show that while agriculture is often analyzed as an economic activity, it is rarely described as a kind of culture. What is called "agriculture" is a part of different ethnic cultures and is an important sub-culture within a culture as a whole. Although this is generally and widely recognized, agriculture is generally not treated as culture nor is there found the concept of it as a sub-culture in many of the published works of research in this field.

Of course, it is hardly necessary to say that simply because agriculture is economically one of the most important production activities, it should be treated as such. Even in the field of ethnology, there is no reason to make light of this fact. However, in ethnological writings which take only a broad view of economic activity, there is the danger that the importance of the cultural meaning of such economic activity will be overlooked. This is especially important in the case of the various societies in Africa. Agriculture constitutes a cultural base for these societies and is not merely an activity of production. As an index of ethnic group identification, agriculture,

more than language or social structure, is easily transformed. But this fact does not lessen the meaning of agriculture as a sub-culture of an ethnic group's culture. In turn, this quality of changeability has important advantages for cultural historical research. The transformation in agriculture, as C. Geertz has said, must be thought of as within the concept of involution for the reason that farming culture is a sub-system of culture as a whole [GEERTZ 1963].

The forth reason is that one must take into account the ecological relationship between agriculture, with its property of transformability, and the conditions of the surrounding environment. With agriculture as an activity of production within the whole economic sphere, there is, as well, a tendency for agriculture to be readily influenced by the environment, so that more than for most sub-systems, one may argue that there are strong ecological connections between agriculture and the environment. To be exact, since the crops themselves and not agriculture as a whole are easily influenced by the environment, there is a problem if one looks at agriculture as a cultural

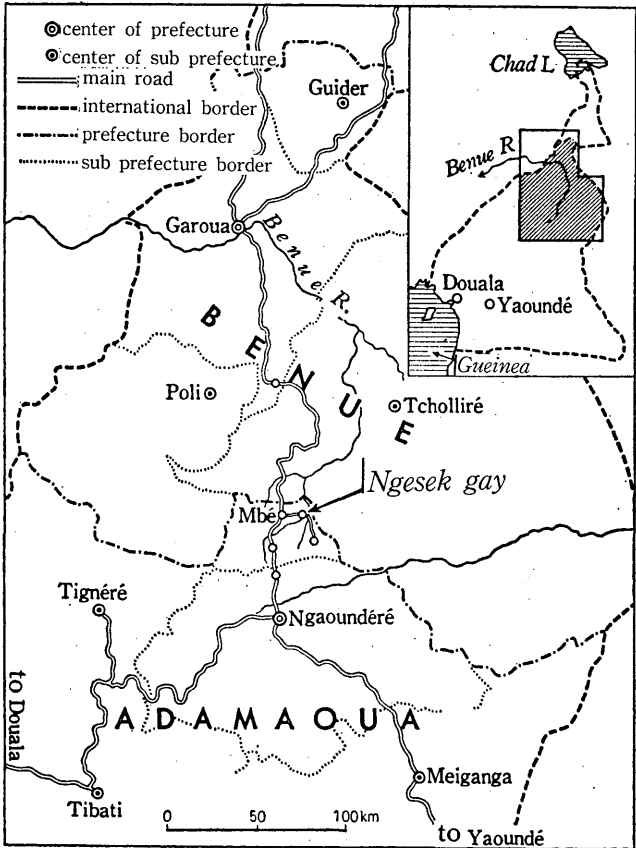


Figure 1. Mbé District and North Cameroon

sub-system. Within the concept of cultural complexity of agriculture, because it is the human beings who make the decisions which allow for adaptations to the environment, these decisions are sufficiently reflected. Those studies which claim that crop distribution is directly comparable to agricultural distribution, as environmental studies, are in error. From an environmental point of view, it is not only agriculture which is connected ecologically with the environment but ethnic culture as well.

For the above reasons the writer, drawing from his research into African society, has decided to base this essay on a study of the concept of cultural complexity of agriculture as a system within an overall culture. The concept of farming culture as it occurs within different African societies is a workable conception for giving meaning to discussions about culture. In this paper, the agriculture complex of the Duru people will be treated, which is to say, a cultural analysis of the Duru people conducted.

1. CROP COMPLEXITY IN DURU AGRICULTURE

Traditional forms of agriculture in Africa and the classification of farming culture and its comparative standards are, needless to say, based on a crop rotation system whereby the fields are alternately cultivated and then allowed to lie fallow. First, I will discuss the basic crops which comprise Duru agriculture, and the swidden fields which they till. Because there have previously been many detailed reports, I will confine myself to only a brief description [HATA, 1973].

The Duru people, who base their livelihood on swidden cultivation, operate three kinds of agricultural lands. Among these are two kinds of burnt fields, forming two of their agricultural patterns. These are discussed below:

Bush fields—The Duru people clear the bush and lay out fields in which they plant sorghum, their main cereal crop, as well as minor cereal crops, legumes of various types, and several cucurbitaceous species.

Yam fields—In the areas around the settlement, especially those parallel to the main roads, the Duru lay out fields which are designed chiefly for yam cultivation.

Apart from the above two types of fields, the Duru also have permanent tobacco fields which are located within the territory, in the region where the Vanna River overflows its banks, giving rise to flooded plains. Here the tobacco cultivation from November to March is limited exclusively to the dry season [HATA 1972].

As noted above, the Duru operate two kinds of swidden fields as well as permanent tobacco fields, but because the purpose of this essay is to analyze Duru agriculture, the writer wishes to minimize the description of the tobacco fields.

The crops which the Duru farming people cultivate in their swidden bush fields are:

Cereal species

sorghum *Sorghum vulgare*
maize *Zea mays*

tut
nambam

pearl millet	<i>Pennisetum typhoideum</i>	tut syem
rice	<i>Oryza glaberrima</i>	tut hot

Legumes

cowpeas	<i>Vigna sinensis</i>	hu'
groundnuts	<i>Arachis hypogaea</i>	'aam
Bambarranuts	<i>Voandzeia subterranea</i>	'aam kin

Root crops

sweet potatoes	<i>Ipomoea batatas</i>	dambaa
sesame	<i>Sesamum indicum</i>	'no'om

Others

okra	<i>Hibiscus esculentus</i>	hook
cucurbitaceous fruits		4 species

The above crops are involved in the cultivation system of bush fields but, among these crops, there are those which are planted together and those which are sown separately in different parts of one field—those, being in other words, single planted crops. Their classification is given below:

Mixed planted crops

sorghum
maize
groundnuts
cowpeas
okra
4 species of cucurbitaceous fruits

Single planted crops

rice
sweet potatoes
bambarranuts
sesame

The above list, in reduced model form, is given in Figure 2. It is necessary, here, to add an explanatory note about sesame. As listed above, sesame is grown as a single planted crop but this does not mean it occupies one portion of a field exclusively; rather, that it is the crop preceding other crops, planted the first year a field is put into use. It is planted immediately after a field has been cleared, but calling it the "first" crop has a slightly different meaning, because the Duru clear their new fields twice, once during the rainy and once during the dry seasons. In the rainy season (usually July to August) the Duru are chiefly engaged in weeding the

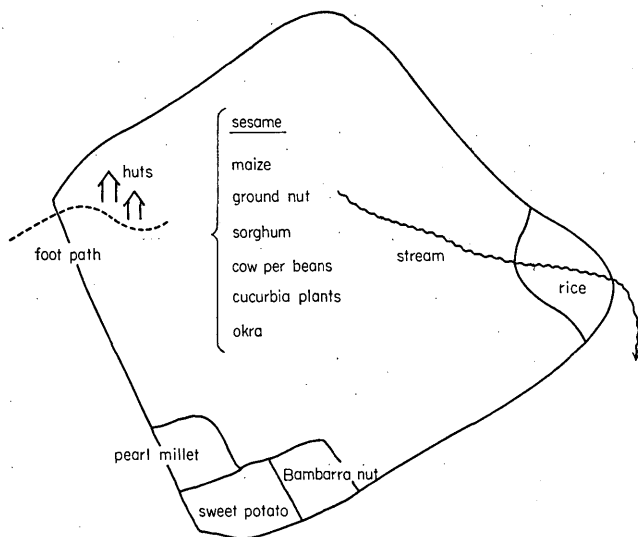


Figure 2. Planting type on bush field

savanna forest (that is to say, digging up roots). As soon as the area needed for a field has been prepared, sesame is sown. This takes place in the middle of the rainy season. The de-forested areas are not burned but instead are planted with sesame. Then, sometime after the middle of December, the sesame is harvested. Thus, in Figure 2, sesame cannot be listed with the mixed crops, from which it differs. Further on the case of sesame will be described in greater detail.

Viewing crops in terms of how they are gathered, the type of agriculture which has developed in these bush fields belongs to the Sudanese type of agriculture, a type widely distributed throughout the inland savanna and steppes of West Africa. The regional heart of this type of crop collection is tropical Africa, the area in which these crops originated. The few exceptions are maize, groundnuts and sweet potatoes. Because of this, basic Duru agriculture, with its bush fields, can be seen as occupying a position within the Sudanese pattern of agriculture (which Harris refers to as a "sorghum-millet" type).

Next, concerning the crops which the Duru plant in their burnt fields, one may wish to question the consciousness with which they view them. The facts, as gathered in earlier investigation, have been previously reported elsewhere, so I refer the reader there.

Of the crops which the Duru plant in their burnt-over fields, there are four kinds of minor cereal crops. Of these, those whose names I would like to stress are sorghum, pearl millet and rice. The Duru refer to sorghum as *tut*, and the names for pearl millet and rice are based on this word, and are *tut syem* and *tut hot* respectively. From what has been observed of the actual linguistic usage of such terms, to the Duru the concept of *tut* is the basic concept of reference to cereal crops. It can be assumed that the Duru do not see the concept of *tut* as stopping at merely the name

for millet, but as the word which represents their principal cereal. From the above example, it can be clearly understood that of the cereals which are part of Duru culture, *tut* is central. Looking indirectly and only at the example of the Duru people, the economic importance of pearl millet and sorghum is slight. Pearl millet, along with sorghum is a very important crop in the West African savanna, but the Duru only plant them in small quantities and due to the crop rotation which they employ for their bush fields, pearl millet and sorghum only occupy the position of single planted crops sown in one portion of a field. Beginning with the Duru, among the numerous tribes living in Northern Cameroon, the French general equivalent for pearl millet is "fonio". Because these two words—fonio and pearl millet—refer to completely different species of crops, the fact that this mistaken usage is widespread demonstrates that in the Adamaoua region of North Cameroon, pearl millet was introduced long after ordinary sorghum, and that it is unimportant.

The case of rice is a similar one. In the village which served as the focus of this investigation, it was determined that rice belonged to the *glaberrima* species found in the western part of Africa. The Duru have chosen to plant upland rice along the lower slopes of basin-shaped plots. The areas planted are small in size and of little importance economically. One cannot, therefore, say that rice plays a central role in their crop rotation system. For the Duru, rice is no more than one of the many products of their overall crop system.

Maize, which is one of their minor cereal crops, is called *nambam* by the Duru. As has been discussed in a previous paper [HATA 1973], the word has the same meaning as sorghum in the Mboum language. The Mboum are a tribe living in the grasslands of the Adamaoua highland, which are adjacent and to the south of the area in which the Duru live. Some of them live intermingled with the Duru people and the two tribes are closely connected culturally. This does not mean to imply that one may immediately conclude that the Duru acquired maize from the Mboum, but it does hint at a route within the cultural historical background of the Duru agriculture.

The connection between the two in terms of cultural history is that, like the Duru, the main cereal of the Mboum is recognized as *tut*. The shape of the spikes and the color of the seeds demonstrate that there are many varieties. The sorghum planted in Duru fields also comes in many varieties. In Ngesek Gay, the village which is the subject of the research, the overwhelming number of varieties have spikes with a diffuse pattern and seeds of a red color. During the time when the measuring took place for the field which the writer of this paper primarily focused on, of the 251 spikes obtained, only 6 of them were white and all of the others were of a reddish color. The color of the seeds of those sorghum spikes which have a cluster shape is usually yellow-gray but at Ngesek Gay, such seeds are very rare. The Duru differentiate between the two types: the sorghum with a red color and a diffuse pattern was called *jorome* at Ngesek Gay and that which is white was called *patabe*. This differentiation was not extended to planting techniques. It is of interest that the people who live at Ngesek Gay reported that their own sorghum was of the *jorome* type and that of the surrounding villages (namely Vourniy Sanfou and Vourniy

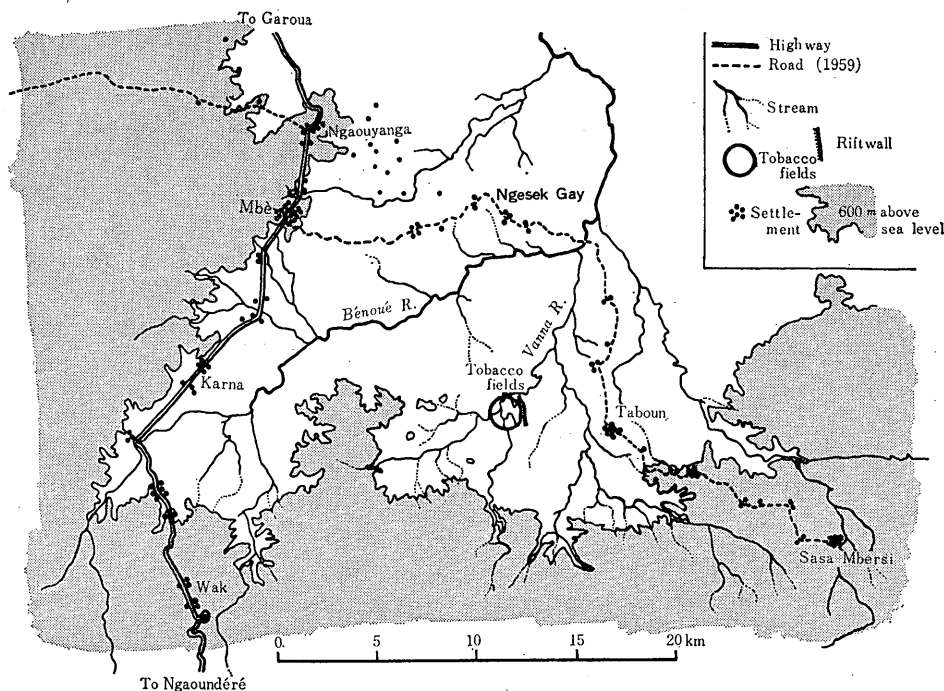


Figure 3. Central area of Mbé District

Ngaoyak), was of the *patabe* type. After having examined the fields of the people of Vourniy Sanfou, the writer verified that in fact there was a large amount of sorghum of the white, diffuse pattern type, or the *patabe* type. Moreover, although the village of Vourniy Sanfou is in the territory where the Duru people live, the people presently living there customarily speak Mboum and it is a Mboum village. There is only a distance of about 100 meters separating these two neighboring villages, and their ecological conditions show no difference at all, so that the fact that there is a difference in the amounts of *zorome* and *patabe* which they plant can only be explained as a difference in the cultural selection made by each of these two peoples. The difference in cultural selection is strongly tied to one aspect of tribal culture.

In Ngesek Gay, this extremely rare sorghum with a cluster pattern and seeds of a yellow-gray color was called *tut mban*, and the villagers did not consider it to be a part of what is called Duru sorghum. They stated that such sorghum had come from Ngaoundere (the capital of Adamaoua province) which lies to the south, and that it was Mboum sorghum as well as Foulbé sorghum.

As shown above for sorghum, the Duru people's chief cereal, classifications by Duru farmers are based on the shape of the spikes and the color of the seeds. However, this classification does not lead to differences in agricultural techniques, rather it is thought to be a consciousness of cultural differences or of the transmission of genealogy. In Ngesek Gay therefore, the basic crop of the Duru is *zorome*, that is to say sorghum which is red and has a diffuse pattern. This sorghum, called *tut*,

is the core of the concept. At least, in making a hypothesis about the Duru's cultural complexity of agriculture, this red, diffuse-patterned sorghum becomes a central factor to be taken into consideration while other factors, such as the remaining varieties of sorghum and the lesser cereals, can be considered as subordinate to the former as they combine together to form the overall structure of a complex of farming culture. In turn, the relation between the primary factor and the other subordinate factors becomes a question for cultural history to attempt to answer.

Now let us turn to one more kind of field which the Duru cultivate: the yam field. In their yam fields, the Duru plant mostly several species of yam as well as should follow those plants the Duru mostly plant, manioc and macabo root species, sorghum and maize, groundnuts and cucurbitaceous species.

The yam fields are cultivated for a two year period. Of the plants listed below, a clear distinction is made between those which are sown in the first year immediately after the fields have been laid out and those which are not sown until the second year. The following list gives the observation results.

Plants sown in the initial year

yams	<i>Dioscorea</i> spp.	<i>dup</i> and <i>to'</i>
macabo	<i>Xanthosoma sagittifolium</i>	<i>mbat</i>
cucurbitaceous fruits		4 species

Plants sown in the second year

manioc	<i>Manihot utilissima</i>	<i>mbaye</i>
maize		
sorghum		
groundnut		

During the first year, yams are planted in ridges in the newly laid-out yam fields, and along both sides of the ridges cucurbitaceous fruits are planted. It would be too much to say that there are more than 10-20 macabo plants in any one given yam field, and at the time of this investigation, the amount cultivated was in fact very small. Consequently, when looking at the cultivation percentages for the initial year in which a yam field is planted, one may go so far as to say that there are almost entirely yams.

Subsequently, if we look at the cultivation patterns for the second year planting, it is not correct to say that all of the plants listed for the second year are planted together as one group. Actually, only one of the plants listed is sown during the second year. In Ngesek Gay, during the second year planting, there was no instance of a field planted with more than two crops, but this statement is limited to Ngesek Gay only. Manioc was the plant most often sown during the second year, and groundnuts were also planted in many yam fields. During the first year of crop rotation, yam fields are most often planted with yams and during the second year, manioc. The next most often is with yams during the first year and groundnuts during the

second, in order of frequency. On the basis of the above observations, the Duru yam field rotation type is outlined as follows: during the first year, yams, cucurbitaceous fruits and macabo are planted and during the second year, manioc or groundnuts.

During the time of this investigation, yams were cultivated chiefly to provide the Duru with a cash crop, so to some extent the species of yams were limited to suit the purpose. Despite this, the Duru have names for all of the respective species, and in their cultivation techniques they exhibit culture which has characteristics in common with other yam cultivating peoples of west Africa.

The Duru generally call yams *dup* but there is one species which does not come under this name. This is the air tuber which has developed specially and is an enlarged mutant form of cashew (*Dioscorea bulbifera*). The Duru refer to this as *to'*. Thus, the Duru distinguish within the *Dioscorea* genus between those plants that they use which grow underground called *dup* and the air tuber of the cashew which is *to'*. In the case of *to'*, there is a name for the seeds as well as for the air tuber itself. Roots growing underground are called *si'*, but for the cashew the air tubers are called *to'*, and roots under the earth are called both *to'si'* or *si'to'*.

For yams belonging to the *dup* genus in the Duru language, there are more than ten names. To use the example of Ngesek Gay, of those species which Duru generally plant in their yam fields, there are the following four types;

<i>mbo</i>	<i>Dioscorea alata</i>
<i>ngang</i>	<i>D. abyssinica</i>
<i>baakonkaa</i>	<i>D. rotundata</i>
<i>haa</i>	<i>D. dumetorum</i>

Other than the symmetrical way in which the Duru classify and distinguish seeds, they further distinguish male and female yam plants, calling the male *dupiee* or *dupnaa* and the female *dupkiin*. It is reported that this is related to the species of the plants, and that to the Duru people, of those yams which they chiefly plant in their yam swidden fields, only the *mbo* (that is to say, *D. alata*) are female and all of the remainder are male.

Since the *mbo* alone has received a special distinction, perhaps the *mbo* holds a special position within the yam planting culture of the Duru. This may further be presumed because although the other, so-called "male" species are harvested twice a year, the *mbo* is harvested only once; and although as we have said above, the Duru of today grow yams for cash, after the harvesting it is the male yams harvested twice annually which are taken out, while the *mbo*, harvested once annually, are eaten within the village.

Furthermore, the *mbo* has another name, *dupnan*, by which it is called. The writer hypothesizes that in traditional Duru yam cultivation, the *mbo* held some sort of important position for the Duru before it became transformed into a cash crop.

Together with the yams belonging to the *dup* genus, the Duru cultivate *to'* or cashew yams. These cashew yams originated in south-eastern Asia and are treated as yams. In west Africa they are hardly ever planted, rather they are generally treated as weeds. But among the Duru generally, and not just in the investigated village,

cashew yams are planted and both the roots and the enlarged air tubers are used as food. This means that the Duru yam cultivation culture highly values its cultivation of the cashew yam.

In any case, in the growing culture which the Duru farming people possess, there is an opposing classification between *dup* and *to'*. This is seen as a central factor in the complexity of yam growing culture, yet, within the concept of *dup*, which includes the positions of the respective species, particularly the male yams as well as those which are eaten—the *mbo* (*D. alata*) is assumed to be of greatest importance.

2. THE CROP ROTATION SYSTEMS IN DURU AGRICULTURE

In the preceding chapters, the writer has discussed one of the important elements of the Duru's cultural complexity of agriculture, namely, crop complexity, and has examined its level of cultural meaning. Here, we will examine the complexity of crop cultivation organization as well as crop rotation systems. Because this question includes the development of Duru agriculture through time, it is necessary at the same time to become acquainted with their agricultural calendar.

The area of the Mbe district of northern Cameroon in which the Duru live has alternating wet and dry seasons which are generally fixed. Generally, the rainy season is from the middle of April until the middle of October, and from the middle of October until the middle of April of the following year is the dry season. Consequently, the beginning of the agricultural year is the time when farming begins, or in other words, during mid-April at the onset of the rainy season. The Duru conceive of a year as being composed of twelve months, but their initial month called *dug-dug* thus begins in mid-April. Traditionally, the Duru have always seen the beginning of the rainy season as marking the beginning of a new year. This discussion will be continued in greater detail later in this paper.

At this time, a discussion of the crop structure and the crop rotation system which the Duru use for their bush fields will be discussed.

The structure of bush fields and the cultivation of sesame are based on Duru agricultural systems and are closely tied to one another. The sowing period for sesame occupies the same position as if it were the first year for planting a bush field. The sowing is always accompanied by the clearing of new fields.

The Duru divide up the work of clearing the forests for new fields into large portions and carry it out twice annually. The meaning and form of each portion differs from the others. In the middle of the rainy season, from July to August, trees are not cut down when the forests are cleared. Instead, only their branches are cut off, and the forest is opened up with the trees still standing. The main activity then is eliminating weeds, which are pulled up by their roots.

When one fixed plot has been weeded and is clear, sesame is planted. The seeds are planted by scattering them around. In about five months, in December or January, the sesame can be harvested. In this manner, sesame is sown in plots

created from areas which have been reclaimed during the height of the rainy season, the only setting in which this occurs.

A second kind of deforestation to open up new fields takes place from November to February, which is during the dry season. Compared with the above method of deforestation, this second type can be called a "real" kind of deforestation, as it requires much more time. That so much time is required is due to the fact that the strenuous labor of cutting down the trees is carried out simultaneously with the harvesting and threshing of sorghum, the main food crop, and with the performing of other tasks ordinarily undertaken during the dry season.

Deforestation takes place only with the use of the axe which the Duru call *bok*. These axes are about the same height as a man's back and strike the trees at a direct perpendicular angle as the tree is hewn down. The average tree is about 10 centimeters in diameter, but when the tree is about 30 centimeters in diameter, then the usual position for the axe is changed to one about 20 centimeters higher, while the tree is chopped down. In such cases, two people work in tandem from either side of the tree, and judging from the observations of the writer, it takes approximately six minutes to cut down a tree with a 30 centimeter diameter. Once the tree has been felled, the branches are soon cut off. To accomplish this the axe is swung down perpendicularly from overhead and the branches are cut off in order of their size beginning with the larger ones. Each time a tree is cut down, an estimate is made as to the direction in which it should fall. When a single plot has been cleared, one finds a "mountain" (actually, a pile) of trees in the center of the new field. Thus, when a tree is cut down, it is aimed towards the center of the plot where this pile will be formed. This is done for the fire lighting which will take place in the field afterwards.

During this time, the sesame harvest takes place and those fields which have been cleared and planted with it during the rainy season are not cleared again after the harvest. The trees which have been cut down and amassed in the middle of the fields are neglected until March or April, just before the beginning of the rainy season, at which time they are burned. Efforts to construct fire lines or other means to prevent the spread of fire were not undertaken but as the Duru cut down trees, as mentioned before, they are fully conscious of this and the way to go about their work. The lighting of fires in the fields takes place numerous times and always with scrupulous care. Those trees which have not ignited are collected and re-lit until all of them have been completely burned.

In this way the swidden fields are designated during the time when they are burned, depending on the year, early rain sometimes begins to fall and weeds already start to grow. At these times, this unwanted grass is weeded before the crops are sown. There were among the farmers, at the same time, those who felt that weeding before the actual planting was very important and those who gave it little significance. In any case, weeding is controlled by natural factors that change from year to year such as whether or not the rains come. Since weeding before planting is not done

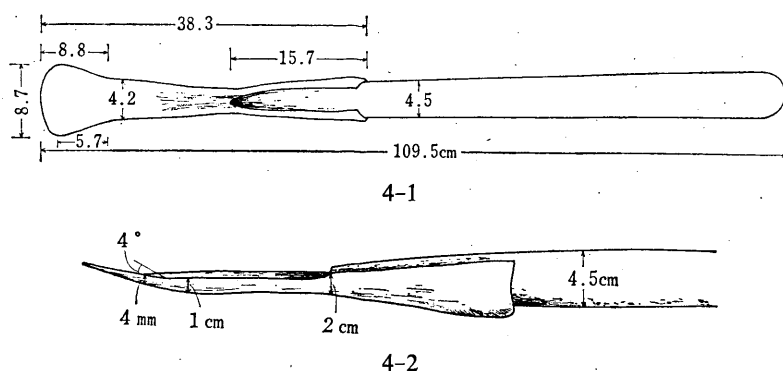


Figure 4. Dimensions of *tong-kii*

by all of the Duru, it is a practice that cannot be included within the structure of the part of Duru agriculture which is strictly controlled.

Dug-dug, the month in which the rains begin, is the month during which all the crops which are to be cultivated in the bush fields are sown. This is customarily the period from the middle of April to the middle of May. In the bush fields, the area planted occupies the greater portion of the field. In regards to the mixing together of several crops, when a bush field has been burnt and is to be planted for the first time, maize is generally chosen as the initial crop. With two people working together, one of them uses a stick for digging called *tong-kii*, or a *tong* for weeding, another farm implement, to dig holes for the seeds, and the other sows two or three seeds from the container in to the fresh-dug hole. The hole is then covered with earth. Within two or three days after the seeds have been sown, maize shoots begin to sprout, and then, in the same manner as the maize, groundnuts are sown in separate holes, with a fixed number of two seeds per hole.

When the groundnuts have likewise begun to sprout, again in the same manner, one person digs holes in places apart from the maize and groundnuts and the second person plants 4 or 5 sorghum and cowpeas seeds, and 1 seed of cucurbitaceous fruits or okra in the same hole, and these, too, are covered with earth.

In the above manner, the chief portion of the planting is thus completed, but in order that this discussion may be clearly understood, one must clearly distinguish between dibbling and seeding—the former being the work of digging the holes which will receive the seeds and the latter being the insertion of the seeds themselves. Dibbling is ordinarily said to be men's work and seeding is said to be the work of women and children. However, there do not seem to be any taboos on which this is based.

In the bush fields, first maize, then groundnuts and lastly sorghum and other mixed crops are planted over three successive periods. The whole procedure requires between eight and ten days. However, it may be wondered whether in actuality it does not cover a longer period of time, as first they must ascertain that the maize has begun to sprout, and then that the groundnuts are sending forth shoots, before the

final crops are planted. There are many instances where the villagers assist one another with this work. At such times, they form a horizontal line and dig the holes for the seedlings and the work is undertaken in this manner. When the labor is undertaken cooperatively, they are able to complete the work of one portion of the planting in just a single day. Even when the work is cooperative, however, in accordance with what has been said above, the men do the dibbling and the women the seeding.

During this period, in a small area surrounding the bush fields, rice or pearl millet is sown. Both of these crops are sown singly in separate plots, but because the areas cultivated are not so large, only one person is required to accomplish the sowing. The methods are the same as for the other crops, with 2 or 3 seeds sown in the case of rice and 5 or 6 sown in each hole in the case of pearl millet.

For the next two or three months, the chief agricultural activity which goes on in the bush fields is that of weeding. This is begun as soon as the maize shoots have reached a height of approximately 20 centimeters. Weeding is carried out with the use of a weeding tool called *tong* or a hand-held hoe called *kabok*. The work is done by either men or women. According to what the villagers themselves said, weeding was an important and major job and since the rain was falling daily, commuting between the settlement and the fields became a problem. Therefore, while they are engaged in weeding, almost all of the villagers stay in the field huts which are built nearby for the purpose. A number of villagers will remain in the huts for as long as a month without returning to their homes in the village. This would imply that for Duru farmers to manage their burnt fields, the function played by field huts called *waa-bab* is an extremely important one.

The maize is harvested earliest, in the period from mid-July to mid-August. The methods employed for the maize are extremely simple. Ripened cobs are harvested by simply being plucked by hand. When the harvesting is finished, the stalks are not

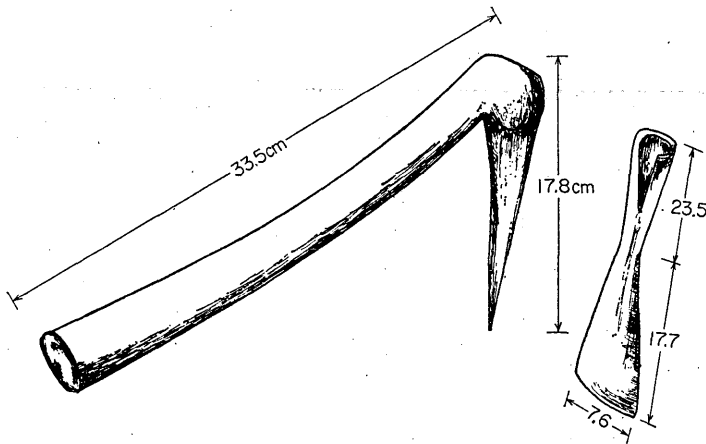


Figure 5. Handle and iron blade of *kabok*

left in the fields, rather, after the harvest, the stalks are cut at a height of from 10 to 20 centimeters above the base of the root and disposed of. The part of the roots left behind are weeded during the second weeding period along with other unnecessary plants.

The harvested maize is stored in granaries built in the area where the field huts are located. These granaries are made of mud, but unlike those constructed for storing sorghum, they are made from woven vines, with the mud plastered from the inside. The whole structure is set upon a simple frame and stands about a meter off the ground. These maize granaries are called *nbaga* and they serve as granaries for drying. The cobs which are preserved to be used for the following year's planting are not kept here, but rather are hung above the hearths of the field huts or the houses in the settlement. At this time, a part of the bush fields are planted with Bambarra-nuts and also with sweet potatoes.

The groundnut harvest follows that of the maize. The work involves only digging up the plants with a hoe. Once the groundnuts have been washed, they are dried in the inner gardens of the compounds of the settlement. After the groundnuts harvest, from about the middle of September, the farmers begin their second weeding. At the time of this weeding, it is a very important job. At this time, too, the harvesting of the rice and Bambarra-nuts is also taking place.

Beginning with the sorghum, the cowpeas, okra and cucurbitaceous fruits are harvested in the middle of December, one month after the dry season sets in.

Sorghum is harvested by bending the stalks and breaking them off at the root. Several stalks are grasped in one bundle and broken off with the hands in a generally fixed direction. The end bearing the spikes is in front of the harvester, who cuts the root end with a knife. Sorghum cutting is usually done by the men. The sorghum spikes are then collected in some kind of receptacle such as a basket or a gourd, and are carried to a threshing place which has been previously constructed. The threshing place is called *kwak-tut*. This part of the work is performed by the women. The division of labor by sex for harvesting work is quite loose, and in reality, women do participate in the cutting work that is supposedly only for the men.

The places for threshing sorghum, *kwak-tut*, are also used for drying it. These drying places are constructed in an open plot neighboring the bush fields. First, all of the plants are removed, and then, from the settlement areas, black mud is taken from along the streams running there. The mud is brought to the plots and spread thinly to cover it all, water being added as necessary. Then the plot is left to dry out. Large plots are 10 meters to a side while the small ones are half that amount; that is, five meters.

When it is time to dry the sorghum, it is spread out on a low platform made from the stalks of the sorghum. On top of this the spikes are piled up, with their ends pointing outward and the roots facing inward. The sorghum is piled up until it takes on the shape of a hemisphere. Usually on top of a large hemisphere, a smaller one is added, and so when all of the sorghum is finally gathered, the entire shape

resembles a smaller hemisphere placed on top of a larger one. Charms are placed around the circumference of the heap and on top of it. These charms, called *gam-tut*, are bestowed on the small, upper pile of sorghum, which is not threshed but preserved as is as seeds for the following year's planting.

The sorghum in the drying plots is, for about a month, left to dry. In order to protect it from birds and other danger, it is covered with a coarse straw mat or a net.

The sorghum threshing is begun between January and February. All of the threshing work is done cooperatively. In Ngesek Gay, the farmers who are going to engage in threshing sorghum announce it in loud voices the night before from the central square to the people of the village in which they were gathered. At this time, the women assume a new importance in their families. They make sorghum wine, and the following day, when the villagers have assembled in the drying places of these farmers, are served this sorghum wine by the family members of those who own the sorghum, and who then participate in the threshing work.

When the threshing time begins, the owners remove the top pile of sorghum from the overall mound, and together with the *gam-tut* they put it in a corner of the drying plot. This must be done by the owner of the sorghum himself.

Threshing the sorghum is quite a simple affair, which involves little more than beating it with a 2 meter stick. This stick, which is fashioned on the spot, is not made in any particular or special way, but is chosen rather because of its suitable thickness. A large number of men surround the "mountain" of sorghum and begin to beat it. It is the younger men who assume the important role here, while instead of doing the beating, the older men break up the pile and collect the spikes which have flown about in different directions. They also take care of any administrative accounting work which is necessary. The owners, however, do not take part in the above activity. Rather they are devoting their entire energies to serving sorghum wine.

This cooperative sorghum threshing takes place together with work the of making wine and is something very meaningful to the Duru. This is due to the fact that if the work is undertaken cooperatively, the entire threshing can be completed in one day. They themselves say that the work only requires a single day to complete but from the amounts which they were observed to handle, this would not be possible if only the owner's family of the sorghum were involved. The harvest of the village chief, which appeared to be the largest amount, took more than a day to thresh. From the entire village, people came and worked from early in the morning, but as it still had not been completed by nightfall, it had to be continued on the following day.

While they drink sorghum wine and continue their work, from time to time, they bring out their drums and beat them to encourage those who are working. When the drums are played, the Duru god, known in their language as *guk*, with his face covered by a kind of grass of the rice family that is found growing in the burnt fields and his back covered with leaves from the trees, makes his appearance. Thus we can easily see that the sorghum threshing process is more than simply an agricultural labor, but fulfills an important harvest related ceremonial function as well.

In Ngesek Gay, there were more than 60 bush fields being operated, so that threshing activities were visible for a period extending over a month.

The accounting work, which is begun when the threshing has been accomplished, is chiefly that of the wives of the men who own the sorghum, and takes place in the threshing rooms. The sorghum which has been separated from the spikes is collected and the remaining husks left to the wind. When the sand and other extraneous matter has been removed, the sorghum is finally stored either within the people's houses or in the sorghum granaries which are built next to the field huts.

During the period from December to January when the work with the sorghum is going on, the cowpeas, sweet potato and sesame crops must also be harvested. Consequently, by the middle of January, all of the crops in the bush fields have been harvested. Thus, in the height of the dry season, which is the period following the completion of the last of the harvesting, apart from the sorghum threshing which we have just considered, the villagers engage in clearing new fields, and building granaries and houses in the settlement.

Furthermore, they engage in yam cultivation, which occupies the position of the largest task performed during the dry season. Yam fields, unlike the bush fields which are laid out within the savanna forests, are prepared in the areas near the villages. Most of them are parallel to the roads which lead in and out of the villages. The reason is that yams are cultivated as a cash crop, and thus as soon as the yams have been harvested, they may be easily transported out of the villages to the markets.

The fields in which the yams are grown are covered with a kind of grass, called *to'o*. Cultivation begins once this grass has been cut. This is achieved with the use of digging sticks and other weeding tools, by digging up the roots of clumps of grass. These are then left in the fields which are being planned as yam fields, and there they are dried. The shape of the fields is determined according to the grass cutting but the Duru then dig ridges and the overall appearance becomes square. As the cutting of grass is generally begun in October or November, it coincides more or less with the beginning of the dry season. The cut grass remains in the yam fields for a month to a month and a half. Then sometime between November and December, it is set a fire until the grass is all completely burned. Then ridges are dug in the fields.

Among the Duru, the ordinary method for carving out ridges in the fields is to cut the earth roughly in rows by means of a digging stick or a three-pronged spade used with the feet, and named *fan*, which piles up the dug-up earth on either side. Recently the government has distributed iron scoops among the people and these also may be used. Next the ditches which were dug first are dug even deeper and the soil is piled up on both sides of the ridges. The ash of the grass burned before the fields were laid out is buried in the centers of the ridges. This is repeated many times until the height of the earth piled along the ridges is about 40 to 60 centimeters and the width of the ridges is about 100 centimeters. The length of the ridges is about 20 to 30 meters as a rule, but exceptions, such as a 60 meter ridge (that is, the yam furrow of the village chief) are sometimes seen. It is assumed that the work necessary to dig the yam ridges requires a great deal of effort, but in the case of the Duru, as a rule,

it is done by those who will manage the fields themselves. To put it in a different way, the construction of yam fields (and it does not merely stop here) is work done by a family alone. Only the men and not the women do this particular work, and thus it takes as long as a month or even two to complete.

During this time, the Duru are harvesting and then threshing their sorghum. Whenever it becomes necessary they are, as well, clearing new fields. This period, then, is their busiest time, requiring the hardest work and the greatest effort. In the observations of the writer, the amount of energy required to construct the yam ridges was a problem for the people. This was caused by the large amount of time spent on the construction of the ridges. Owing to this, one day is set aside when sorghum wine is served and the ridge construction work is undertaken cooperatively. This is at the point when the sorghum has just ripened, so that the Duru change over to yam field work when they are momentarily free from sorghum harvesting and drying. The result is that the progress in the work of digging yam ridges in the village is not at all steady. One sees those people who have previously dug their ridges and who appear to already be growing yams at the same time as those who have not even begun to dig the ridges at all. The writer found, however, that even the latest begun ridges were completed by the beginning of March. Yam cultivation covers a long period, from as early as December to as late as March, and therefore the Duru do not undertake it as an intensive activity.

As this writer has previously reported on the planting methods used and the form of the ridges in which the yams are planted, only an abbreviated account will be

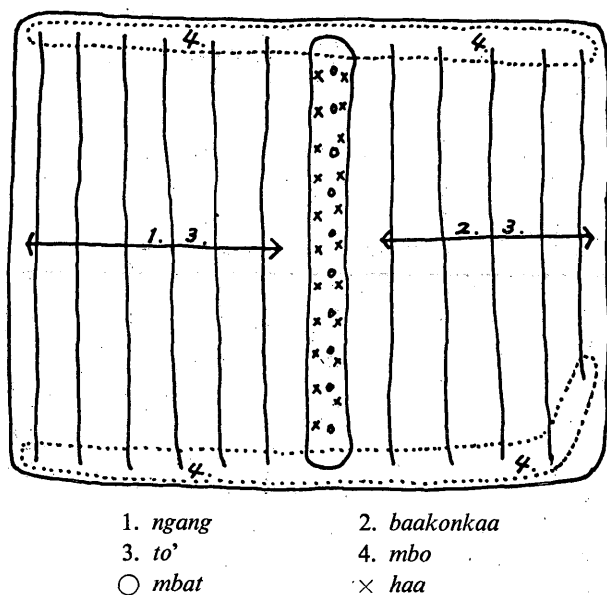


Figure 6. Planting type on yam field

given here. Because the Duru completely finish planting their yams during the dry season, the yams tend to be kept preserved for a long time underground. This belongs to the form that is known as "early planting" [COURSEY 1967].

For a short while after the planting has been finished, work continues on the construction of props to support the new vines. When the ridge-digging for their yam fields is nearing completion, the Duru, as they go and return from the bush field, gather those tree branches which look as if they might be usable, and place them between the yams as support posts. They complete this work during the dry season.

After the rainy season has commenced, in June or July, the major weeding activity centers around the yam fields. Weeding is done either bare-handed or with the use of a weeding tool called *tong*, and is said to be a relatively simple task.

The first yam harvest begins in August or September. For this, a digging stick is used. Of these yams first harvested, few are used for food but instead, they are soon transported to Mbé where there are sold in the marketplace. It is said that one stalk yields three or four yams. In terms of Duru economic life, yams provide a major source of cash.

When the time has come for this first harvest, the Duru sever the stalk with the yams still attached a few centimeters down from the top of the plant. The remaining yams, still attached to a small bit of their stalks, are buried again in the same hole. This is in hopes that they will grow and produce a second harvest. Four months later it is time for the second harvest. The methods used are the same as before. However, a part of the yams which are harvested during this second time become the seeds that will be planted in the new yam fields. The ideal situation is for the second harvest and the planting of the new fields using the yams obtained as "seeds" to coincide in time. However, in reality, the case is often that the ridge digging has not adequately progressed and is not ready. Then the farmers must decide whether to delay the second harvesting until the ridges are finished and ready, or whether to begin the second harvest, leaving in the ground only the amount of yams needed as seeds for the new fields. Because of the variety of situations possible, this is clearly the time when the villagers are faced with the most difficult decision of the agricultural year.

Finally, when the remaining seed yams are harvested, the field enters the second year of the crop rotation system. This time, yams are not planted and the ridges are destroyed. The field is flattened out and the second year of planting begins.

Generally, the crop planted during the second year is manioc. It is planted during the dry season. When the yam field has become a manioc field, for the Duru it is already not the same sort of place that it was, for it no longer requires the same amount of hard work. Now only women are apparent. They gather up the manioc leaves they need for cooking and dig up only the plants which are necessary. After this two year crop rotation period, the yam field is abandoned.

We thus see that in Duru agriculture, the yam occupies the position of the first year crop within a two-year crop rotation system. Every year, new yam fields are constructed. In contrast, the bush fields are planted with a mixture of crops which

do not change over a four to five-year period. Every year there is a repeated cultivation of the same field. This longer period is based on differences in soil conditions. The farmers make judgements as to whether to abandon a field or not on the basis of whether it has an abundance of weeds, whether the soil has been eroded or whether the soil has been exhausted and thus for one reason or another, its productivity has decreased.

As we have seen above, the Duru till two completely different types of agricultural lands which are completely different in form. The crop structure and planting system of bush fields is a descendant of the savanna cereal type of agricultural culture found in the Sudan region. On the other hand, the planting of yams the first year in the yam fields demonstrates adaptability to the savanna environment and for this reason, a root planting form of agriculture has also developed in this region. These two forms are not intermingled, but rather, they co-exist parallel to one another under Duru management. Duru agriculture clearly has two cultural lines—one which is part of the savanna cereal type and the other which is part of the root planting type of culture.

In the next chapter, we will look at another important element of cultural complexity of agriculture, that is to say, agricultural tools.

3. DURU AGRICULTURAL IMPLEMENTS AND THEIR CULTURAL AND HISTORICAL BACKGROUND

To the extent that so-called tools of agriculture are closely related to the overall system of agricultural techniques, these tools can be said to be an important element

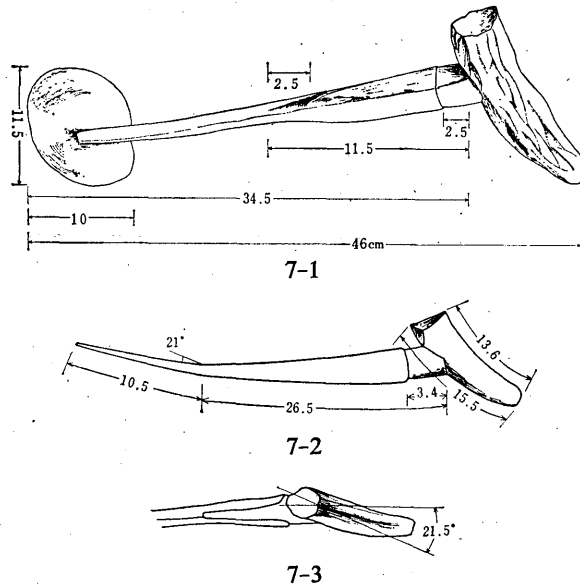
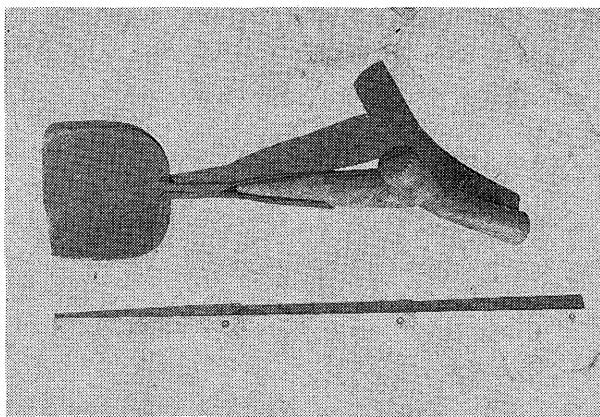


Figure 7. A tong

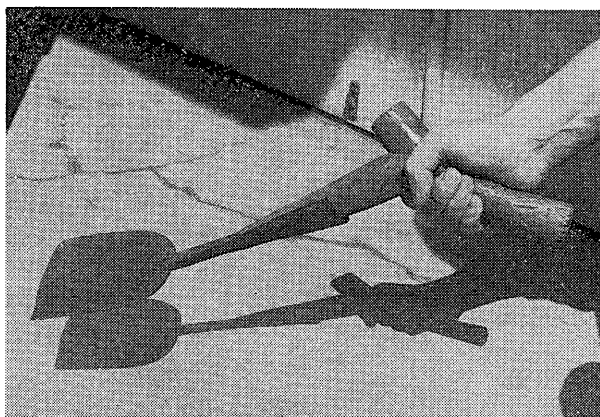
of that farming culture. The writer has not analyzed farm tools simply in terms of their forms or their functions but in terms of the semantic considerations of such tools within the cultural complexity of agriculture.

The commonly use the following types of tools: (a) *tong*—a raking or weeding tool; (b) *tong-kii*—a digging stick; (c) *tong-sakaa*—a digging stick; (d) *fan* or *tong-fan*—a hoe used with the feet; (e) *kabok*—a hand hoe; (f) *bok*—an axe. Almost all Duru possess these six tools: (a), (b), (c), (d), (e) and (f). Generally one person will possess several of each of these. First, I will comment briefly on these—on the form and the general way in which they are used.

The first one, (a) *tong*, is shown in Figure 7-1 and can be clearly understood from the photograph. Its entire length is from 45 to 50 centimeters. It is designed as kind of cutting iron which can be held with one hand. This *tong* has a blade made of metal connected to a pole made of wood. The blade is fixed at an angle of twenty



1-1



1-2

Photo. 1. Shapes of *tong* (this one is different from Figure 7)

degrees or so, (Figure 7-2). In the same way, when the pole is held in the hand, it is used at an angle of 21 or 22 degrees, (Figure 7-3). As can be seen in the photograph, the handle of the *tong* is grasped in the hand and a forward thrusting action is repeated again and again. Generally, it is used in a squatting position, but it may also be used from a half crouching position with the body stooping forward.

The *tong* is referred to as a raking or weeding tool, and this expression provides an explanation for this tool used by the Duru people. However, if one interprets the words "weeding tool" exactly, one may have a mistaken idea about the situations in which the tool is actually used. It is used during the rainy season when the bush fields are cleared. At that time, the trees are not cut down, instead, the primary labor is weeding the ground. For this weeding, the *tong* is used. The Duru call this work "weeding (or raking)" and when the work is finished they plant sesame in the cleared areas.

Apart from this, when sowing time has come, they also use the *tong* to rake the ground when they are digging the holes which will afterwards receive the new seeds. Here the *tong* does not play an important role, rather it is during the planting of the yam fields that it becomes a major tool. When the earth around the furrows in the yam fields has been prepared and the fields are ready, the planting of the yam seeds begins, and at this time the *tong* is the chief tool for digging the holes which will receive the seeds.

Thus, for both the yam fields and for the bush fields, the *tong* is very important and one of their most representative tools. The *tong* has been introduced previously in Baumann and others' "Völkerkunde von Afrika", in which it was described as a "spade", the original word being "spaten". [BAUMANN, H. and others; 1940] Moreover, Werth's account appears to be based on that of Baumann who when he treats the Duru *tong*, changes it in form from a digging stick to a spade. [WERTH, E.; 1954] However, when one considers its size and the use to which it is put, it seems quite impossible to call a *tong* a "spade". Whether or not the reader feels that this is correct concerning the position the *tong* plays among Duru agricultural tools, Werth's description nevertheless is still open to question.

The *tong-kii* —(b)— is also a so-called digging stick. At the head, it is attached to a blade and is 105 to 115 centimeters long. It is cylindrical in shape. Figure 4 shows one example, with the attached blade flat and rather wide. The part which functions as the blade is about 10 centimeters from the tip and is attached at a five to ten degree angle, (Figure 4-2).

From its shape, this digging stick must be held from an upright posture and is used to dig holes in the ground and to turn up the earth. It is the tool mainly used to make the holes for seeds when planting time arrives for the bush fields, and to break up the ground for the first time when the ridges are being dug for the yam fields and later during harvesting. However, to relate the Duru digging stick to the overall agricultural background in which such tools are employed, the Duru make greater use of their digging tools than is generally the case. In the savanna area around the Duru villages, yams are known to grow wild, and whenever they go to dig them up, the Duru

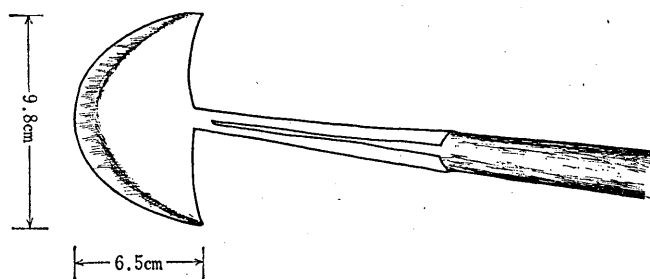


Figure 8. The blade of *tong-sakaa*

always take their *tong-kii* with them. It is the principal agricultural implement of the Duru people.

The *tong-sakaa* —(c)— is not so commonly found among the Duru. In form, it is essentially a digging stick, and in total length is only slightly shorter than the *tong-kii*, that is about 100 centimeters or so. What distinguishes it clearly from the *tong-kii* is that it has a blade at one end, with a different shape. This is shown in Figure 8. Part of the blade spreads out in a half-circle which is fashioned in such a way as to be extremely thin, being no more than 2 or 3 millimeters in thickness.

The *tong-sakaa* is only used in a few situations. The writer saw only one occasion in which a farmer used it to dig up yams during the yam harvest. It is the writer's impression that this particular tool is of a form which is neither here nor there, and is in fact incomplete. If the *tong-sakaa* were to be given a foothold, it would turn into a *fan*, the next tool to be discussed, so that its shape seems to shift and exist halfway between that of a digging stick and a foot hoe.

The *fan* —(d)— is the actual foot hoe. Sometimes it is called a *tong-fan*. At the time of this investigation (that is, in 1969 and 1971), all three of the forms of this kind of agricultural tool were called either *fan* or *tong-fan*. One of these was a foreign-made shovel which the villagers had received from the government. Consequently, this tool had been introduced only recently and the Duru included it within the category labelled *fan*.

The second type of *fan* is depicted in Figure 9 and the shape of its end can be seen. The pole is divided into three parts at one end, in the center of which the blade is fashioned in the same way as that of the *tong-sakaa* described above. Nothing is

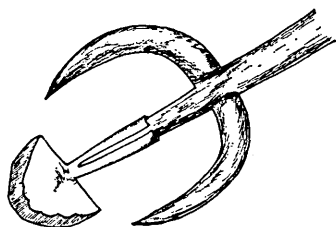


Figure 9. Three pronged *fan*

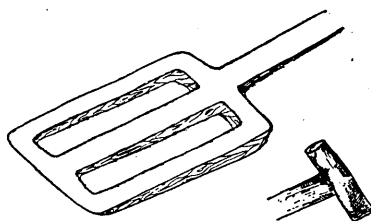


Figure 10. Handle and end of wooden *fan*

added to the two prongs jutting out on both sides of the front end, and they are so thin that the shape points forward, curving towards the front tip. These two prongs which thrust forward are equivalent to the foothold.

One of the tools which is called a *fan* is made completely of wood and has no metal blade. The front end is flattened out like a shovel but its special feature is that it has two grooves which are hollowed out, as is shown in Figure 10. Moreover it is the only tool with a handhold on one end of the pole. It is 100 centimeters long, slightly shorter than the foreign-made shovel.

The above three tools are what are considered in the *fan* or *tong-fan* category, but as the shovel was only lately introduced among the Duru, the remaining two types are the traditional Duru forms of *fan*. However, at the present time, the last tool to be introduced, the wooden hoe is rarely used by the villagers. The three-pronged tool with the iron blade is the tool which corresponds to the words *tong-fan* or *fan*.

The uses of a *fan* are very clearly defined. It is used to make the ridges in which the yams are planted. The Duru pile up and dug up the earth three or four times and it is for this purpose that the *fan* is used. It is the *fan* which is most closely involved in the yam ridge construction. From a functional point of view, the digging tools, *tong-kii* and *tong-sakaa* follow a progression in terms of their forms which pin points a relation between the origins of the digging tools and the hoes.

The Duru hand hoe is called *kabok*. Since the development of the concept of Hacke farming (hand hoe farming), it has become well-known as the representative tool, especially as used in tropical areas. I do not think it is therefore necessary to explain it again but Figure 5 will give an example of one. The pole portion is about 35 centimeters long, which corresponds to the length that allows it to be held in one hand. The steel blade is attached to the pole at an angle of 70 or 80 degrees. This blade can be thought of as being just slightly longer than that of the *tong-kii*. The inner side of the blade is also set at a slightly greater angle.

The *kabok* is only used in the bush fields, and is limited to the weeding work. Previously in describing the *tong*, it was stated that in the bush fields, there is no cultivation, and that apart from the uprooting of weeds which is done during the land clearing which takes place during the rainy season, the earth is not plowed up. In this weed uprooting work, both the *tong* and the *kabok* are used, but the *kabok* is frequently used during the weeding, which takes place after planting. A major weeding operation takes place 2 or even 3 times a year among the Duru farmers and the *kabok* is the principal tool at these times.

In the principle agricultural activities of planting, harvesting and threshing which take place in the bush fields, it is not an exaggeration to say that the weeding for which the *kabok* is used is the one activity which guarantees that there will be a harvest. The development of bush field agriculture is a central form of the savanna cereal agriculture which originated in Africa for which the *kabok* as a tool is one of the mainstays.

The sixth tool —(f)— is an axe, called *bok*. It is related not only to the forms of

axe used widely in Africa, but also to those of the peoples in other tropical regions who engage in burnt field agriculture. The *bok* of the Duru is different from their other tools, and is what Werth calls a "blade stem socket" type. At the end of a 30 or 40 centimeter pole, there is metal blade directly attached.

The *bok* is the only tool used in deforestation work. This means that the *bok* is the tool used primarily in the preparation of the bush burnt fields, and together with the *kabok*, it goes without saying that the *bok* is used in the savanna type of millet agriculture.

Above it was stated that these are the tools used by the Duru in their bush and yam field farming. Apart from these, there are several other tools which they use but here we will omit a description of their original use. For example, every man has a knife which he ties at his waist. In their daily lives, this knife is very widely used. It is used to cut the ears of millet during the harvest, to divide the seedling potatoes and sometimes even to dig simple holes. But to treat it as an "agricultural tool" would create somewhat of a problem, and this is why the description of such knives has been left out.

To treat the Duru agricultural tools as a concept, within the Duru farming tool culture, two orders of the Duru agricultural culture are reflected. That is to say that if one looks at the various situations in which these tools are chiefly used, (c) and (d) are only used in yam fields and (e) and (f) are used only in bush fields. The remaining (a) and (b) are used in both types of field work. Clearly, within Duru agriculture, there coexist both those tools used for yam cultivation and those tools used for cereal cultivation.

The next points I would like to emphasize are the special characteristics of the linguistic forms of the names for these farming tools. As with the discrepancy between the situations in which the respective tools are used, so too, there exists a linguistic discrepancy. The tools listed as (c) and (d) are from the root of the word (a), that is *tong*, and (e) derives from the root of the word *bok*, tool (f). Therefore there are two groups within the tools which the Duru used, those based on the root *tong* and those based on the root *bok*.

To go forward and put forth a provisional hypothesis, although (a) and (b) are used in both bush and yam field work, if they are thought of as "*tong* group tools" then one may hypothesize that connected in lineage to the root cultivation type of agriculture and that the "*bok* group tools" are connected by lineage to the cereal type of agriculture.

One may conclude that the Duru farmers operate two types of fields which have developed within their agricultural culture. These two are bush burnt field farming which is a part of the savanna cereal type of agriculture and yam burnt field farming which forms a part of the root cultivation type of agriculture. It is that the tools which the Duru use clearly show these two lines within the cultural complexity of agriculture as a whole.

4. THE DURU AGRICULTURAL CALENDAR AND ITS SEASONAL ASPECTS

In chapter 2, I analyzed the crops which make up the structure of Duru agriculture. In chapter 3, I gave a general outline of the technical aspects of agricultural work in terms of crop cultivation activities as they take place during the year. Then, in chapter 4, observations were made concerning the relation between agricultural techniques and the Duru agricultural tool culture. From these analyses, I drew the portrait of the entire agricultural complexity of the Duru and at the same time, the existence of two cultural strains within Duru agricultural culture became clear. That is, the Duru agricultural complex consists apparently of a fusion between the savanna cereal type of agriculture and the yam root cultivation type of agriculture.

In the above third chapter, where cultivation and the crop rotation system was discussed in terms of the progression of a year, the Gregorian calendar was used. In today's Duru society, it is a fact that the Gregorian calendar has come into general use due to notifications by the government and through such means as elementary school education. The writer did not notice any serious discrepancy between using the Gregorian calendar as a standard and the actual passage of time. However, it would be questionable to say that the Gregorian calendar is a (permanent) fixture within their agriculture although the Duru use it as the standard for the agricultural activities which go on throughout a year.

When one considers a cultural complexity of agriculture, one cannot omit its spatial development and individual techniques, or the temporal conceptions upon which that culture has been based (in other words, the process of the unfolding of a year). We are left with the task of looking at the major problem of the Duru's conception of time and, within that, of their concrete grasp of the progression of a year.

The Duru possess a calendar which divides the year into twelve months. As we will see in the discussion given below, perhaps it is really not accurate to call this a "calendar", but nevertheless, it is the standard by which they organize their agricultural labors throughout a year. As has been shown in the third chapter, the progression of farming tasks is really a progression closely bound to a calendar. Here, we will take a closer look at the Duru calendar and the aspects of the seasons as they see them.

The word in the Duru language both for "moon" and for "month" is *siin*. They regard a year as being composed of twelve of these months. However, the concept of month does not include the idea of dates. This means that *siin* expresses neither the number of days of which a month might be composed nor does it express such concepts as the middle of a month or the end of a month, because it cannot be subdivided.

The *siin* of which a year is composed do not have a fixed length. No fixed length is recognized, so that some may be equal and others shorter or longer as the case may be. However, the Duru do recognize the individuality of these twelve

months making up a year and have specific ideas concerning them. Moreover, the interconnections between the respective months are clearly agreed upon. Consequently, the Duru can and do make definite assessments as to what the month will be when the present month ends, or what the present month is, or what the month prior to this one was. As a result, they make judgements about the period of a *siin* which reflect the actual state of affairs from one year to the next. Thus, we realize that the Duru idea of twelve months comprising a year hardly fits the general notion of a "calendar", and perhaps it would be better to call it a "seasonal reckoning".

Next, I would like to touch upon the individual months which make up the Duru year. In the discussion, as an aid to understanding, I will refer to the appropriate time that it would be in the Gregorian calendar, but of course that is for the sake of expedience.

Dug-dug: The Duru relate that the month which begins the year is *dug-dug*. This would be from mid-April to the beginning of May in the Gregorian calendar. The word refers to the leaves of grass and trees, and is a bit of a way of explaining that the leaves of the grass and trees are all sprouting at once. In the region where the Duru live, the rainy season begins in April and surely *dug-dug* is the month which corresponds to this. It is also the month when the bush burnt fields are prepared and when various planting activities begin.

In this savanna region, there are many deciduous trees and so the leaves of most of the trees fall off during the dry season and the grass withers completely, but after the rain has fallen several times, at once all of the plants germinate, and this aspect is reflected by the Duru term *dug-dug*.

Uwart: This word is the name for the insect which dwells in the earth. The writer was unable to observe this particular insect but according to the Duru, the name of the insect is used for that of the month because during this time the insect emerges from under the ground and moves around. *Uwart* corresponds to the period of mid-May to early June in the Gregorian calendar.

Waa-bab or *waa-bap*: The Duru prepare fields (that is, bush fields) in the savanna area somewhat distant from their settlements. There are so many different situations that it is difficult to summarize in a few words but generally the fields are prepared at a distance of about a two hour's walk from the settlement. For this reason, they always construct huts in the fields by hand and while the planting or weeding during the rainy season is underway, they stay in field huts overnight. These field huts are referred to as *waa-bab* or *waa-bap*.

The month *waa-bab* corresponds to the period from mid-June to the beginning of July. That it is the same word as that for the huts must mean that the huts are constructed during this time, and this is in fact how the Duru themselves explain it. In view of their structure, these field huts are hardly different at all from the houses in which the Duru live when they are at home in their settlements. Around the circumference of a round house, red clay walls are constructed. A cone-shaped roof is made by thatching it with grass. There is only one support pole and that is in the center of the hut and holds up the roof. During this time, in the middle of the rainy

Table 1. Rainfall at Mbé, 1969
(Post Agricole, Mbé)

J.	0	mm
F.	0	
M.	91.6	
A.	69.6	
M.	161.7	
J.	316.3	
J.	355.7	
A.	359.6	
S.	327.0	
O.	91.2	
N.	22.0	
D.	0	
annual total	1794.7	

season, the construction is completed, so that although it is said that this is when the huts are constructed, the wall-building is in fact a job which must be done during the dry season, enabling the actual work which goes on at this time to consist rather of roof repairing and the like.

Bangowa: The word *bangowa* means "a lot of rain falls". This month lasts from the middle of July until the beginning of August. The Duru relate that during this time the rain falls daily. In table 1, the results of the measurements made of the amount of rainfall for the year 1969 by the Mbe Post Agricole are shown, and even if one allows for differences from year to year, nevertheless July and August are the months in which the greatest amount of rain falls.

Nag-bunni: In the Duru language, the word *nag* means a mortar used for grinding sorghum into flour for food, and *bunni* means "not white". Therefore, *nag-bunni* means that mortar used for grinding sorghum into flour is not white. One possible meaning is that the sorghum which is stored in the granaries has gotten old already, or that the mortar used to grind it does not turn white because there is no grain for it to grind as all of it has been used up. If one follows this explanation, then this is the period when the sorghum which is used for food is at its lowest supply, or the leanest period of the year. From this time on, the Duru's main foods are maize and sweet potatoes. This month is from mid-August until the beginning of September.

Naa: The word *naa* in the Duru language means weeding grass. At it implies, during this month, the heavy amount of work which is required for weeding goes on. The month covers the period from the middle of September until the beginning of October.

This is called the second weeding period of the Duru agricultural calendar. It is here that the hand hoe called the *kabok* is employed. This second period weeding is regarded as extremely important agricultural work because it determines whether the sorghum spikes will reach maturity or not. During this period, nearly

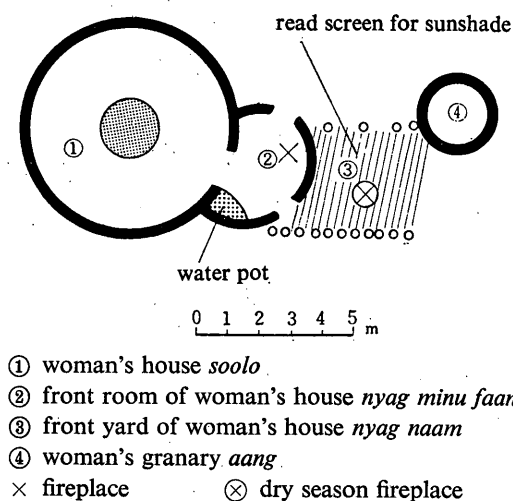


Figure 11. Structure of woman's house

all of the Duru sleep in their field huts and the number of people in the villages diminishes greatly. This, then, is the scene presented during the month of *naa*.

Ziedon: the meaning of this word are of great interest as part of the life of the Duru farmers. The month is equivalent to the period from mid-October to the beginning of November in the Gregorian calendar, and thus marks the end of the rainy season.

As can be seen in Figure 11, during the rainy season, Duru women prepare food at the hearths which are in rooms located in front of their own living quarters (women's houses are called *soolo*) in the compounds. But because these rooms which contain the hearths are small, during the dry season, they usually prepare their cooking fires in the front yard. According to observations of the writer, during the entire dry season, food preparations as well as the eating of meals and gathering for conversation all took place at these outdoor hearths. However, sometimes it happens that women who are convinced that the rainy season has completely ended, come out and resume food preparation at these outdoor hearths when suddenly it begins to rain again. Then, they must hurry to move the cooking fire back inside the house, and this bringing the fire back inside is called *ziedon* in the Duru language.

That the month is known as *ziedon* shows quite exactly how the Duru interpret the changes in nature from the wet season to the dry one. It is during this month that aspects of the dry season begin to appear.

Zumpui: The word *zumpui* means that the new sorghum has ripened, and the Duru themselves say that this is actually when the sorghum is mature and when harvesting of it begins. It is the month from mid-November to the beginning of December.

Hom-waa: In the language of the Duru, *hom* means "cold" and *waa* means

“little”, or in other words that “it is a little cold now”. Inland, on the continent, within a single day the temperature fluctuates greatly, and the region in which the Duru live is not an exception to this, especially during the dry season when the nights become very severe. A single day will record a disparity of as much as 20 degrees centigrade or more from one hour to another. From 1969 to 1970 when this investigation was being conducted, the writer made some measurements of the temperatures at Ngesek Gay, but as they are incomplete, I wish the reader to refer to the single example of given data.

Table 2. Maximum, Minimum and average daily temperature at Ngesek Gay (30, Nov., 1969–14, Feb., 1970)

day	Nov. 1969			Dec. 1969			Jan. 1970			Feb. 1970		
	Max.	Min.	Ave.	Max.	Min.	Ave.	Max.	Min.	Ave.	Max.	Min.	Ave.
1				37.2	13.0	25.1	35.2	13.1	24.1	33.2	12.0	22.6
2				36.2	14.0	25.1	34.7	12.7	23.7	33.7	14.0	23.8
3				36.0	13.3	24.6	34.7	11.8	23.2	35.3	14.4	24.8
4				35.6	11.9	23.7	34.6	12.3	23.4	33.0	15.0	24.0
5				35.5	12.2	23.8	34.0	12.0	23.0	32.7	13.0	22.8
6				35.2	12.3	23.7	34.5	11.9	23.2	33.5	13.5	23.5
7				—	—	—	33.8	11.8	22.8	35.1	14.8	24.9
8				—	—	—	34.4	11.6	23.0	36.5	15.2	25.8
9				36.5	12.9	24.7	32.7	11.4	22.0	36.7	15.2	25.9
10				34.3	14.2	24.2	—	—	—	36.2	13.1	24.6
11				34.6	14.5	24.5	31.2	12.4	21.8	36.7	13.3	25.0
12				35.2	13.5	24.3	30.8	14.2	22.5	37.2	14.4	25.8
13				34.9	13.8	24.3	32.5	13.3	22.9	37.2	14.5	25.8
14				34.7	12.8	23.7	32.0	13.7	22.8	38.1	13.3	25.7
15				33.7	14.1	23.9	32.5	13.5	23.0			
16				33.7	12.4	23.0	32.5	13.6	23.0			
17				33.0	11.8	22.4	32.9	13.2	23.0			
18				32.7	11.4	22.0	33.3	14.7	24.0			
19				33.6	11.2	22.4	32.3	13.3	22.8			
20				33.3	11.8	22.5	32.4	12.0	22.2			
21				33.0	12.0	22.5	32.0	13.0	22.5			
22				33.3	11.5	22.4	33.3	12.5	22.9			
23				32.0	10.8	21.4	33.5	13.9	23.7			
24				32.2	10.4	21.3	33.3	14.0	23.6			
25				31.8	11.2	21.5	32.1	13.3	22.7			
26				32.2	10.9	21.5	33.3	14.0	23.6			
27				32.2	10.9	21.5	31.8	12.8	22.3			
28				33.8	12.3	23.0	33.0	12.8	22.9			
29				34.7	12.3	23.5	32.8	13.0	22.9			
30	36.3	13.0	24.6	34.1	13.3	23.7	32.5	12.9	22.7			
31				35.0	12.1	23.5	32.7	13.5	23.1			

Table 3. Agricultural calendar of Duru

Months of Duru	Meanings in Duru languages	Gregorian calendar	Bush field	Yam field	Tobacco field
<i>dug-dug</i>	(sprouting of) leaves of grass & trees	Apr.	• sowing maize • sowing groundnut • sowing sorghum and others		
<i>uwart</i>	name for the insect that dwells in the earth	May	• weeding grass (first)		
<i>waa-bab</i>	field huts	Jun.	• building (or restoring) field hut	• weeding grass	
<i>bangowa</i>	a lot of rain falls	Jul.	• clearing and weeding of new fields • sowing sesame • harvesting maize • sowing Bambaranut • planting sweet potato		
<i>nag-bunni</i>	a mortar used for grinding sorghum into flour which is not white	Aug.	• harvesting groundnut	• harvesting yams (first)	
<i>naa</i>	weeding grass	Sept.	• weeding grass (second) • harvesting Bambaranut	• (remaking fields) • (planting manioc)	
<i>ziedon</i>	bringing the fire back inside the house	Oct.	• harvesting rice	• making new fields (cutting grass)	• making field
<i>zumpui</i>	new sorghum has ripened	Nov.	• clearing of new fields	• making new fields (firing)	• sowing seeds • transplanting seedlings
<i>hom-waa</i>	little cold	Dec.	• harvesting sesame • harvesting sorghum • harvesting pearl millet • harvesting sweet potato	• making new fields (digging ridges)	• weeding • picking sprout
<i>hom-na'a</i>	greatest cold	Jan.	• clearing of new fields • threshing sorghum		
<i>zum-waa</i>	lesser hot	Feb.	• preparing of new fields (firing) • (sometimes) weeding grass	• planting seed yam	
<i>zum-na'a</i>	heavy hot	Mar.		• thrusting support post	• harvesting • drying
		Apr.			

* Rainy season: from *dug-dug* to *naa*, dry season: from *ziedon* to *zum-na'a*

The Duru farmers regard the period of mid-December until the beginning of January as the cold season, and this is based on the nights during which it gets very cold. This is also the season when the sorghum harvesting is fully underway.

Hom-na'a: This month corresponds to the period from mid-January to the beginning of February. The name means the period of the greatest cold. The dry season is at its height and the temperatures from day until night fluctuate greatly.

In table 2 the changes during the month of *hom-na'a* cannot be clearly discerned, but the Duru farmers will relate that "after the period of milder cold comes the period of the severest cold." and this is the time when the sorghum is threshed.

Zum-waa: The word *zum* is the opposite of the word *hom* and means "hot" so that if one translates exactly, the name of the month means the period of "lesser hot".

Zum-na'a: The name means that the period of greater heat has set in. It lasts from mid-March to early April. The transformation from milder heat to much more severe heat within a month is due to the special meteorological characteristics of this region. The well-known hot wind called harmattan blows down to the south from the Sahara desert and surely its influence can be felt in the areas which the Duru inhabit, which would account for part of the change.

According to what the writer heard from people who were connected with a church in Mbe, from the middle of February on the temperature slowly begins to rise. Then from March to April, there is occasional rain, the temperature suddenly rockets, and particularly hot days continue in succession.

To the Duru people, this month of great heat signals the end of the dry season and a time when the rains are not far to come.

Above, I have given a description of the twelve months which make up the Duru year. As can be seen from the examples, if the concept of a month captures exactly the essence of the natural environment, then it should reflect the special characteristics of a people's livelihood and agricultural activities. If one excludes the dry season month of April which overlaps both *hom-waa* and *zum-na'a*, Duru livelihood and agricultural activities are unmistakably depicted. To put it in another way, the succession of months provides an index to the Duru livelihood and agricultural activities. The Duru do not perform their agricultural work on the basis of what month it is in the Gregorian calendar, instead the yearly agricultural development index provides their calendar. Or the agricultural work in which they are engaged provides the index of what month it is within the progression of a year, and this is their calendar.

Therefore, the concept of "twelve months" to the Duru is connected to the annual cycle of their lives, and can be looked upon as intensifying the complexity of their culture. Within their calendar, as an agricultural cycle, the important composition of the annual cycle of their daily lives appears.

In conclusion, here, in this chapter, we have continued the discussion, begun in the third chapter, of the agricultural work which the Duru people engage in throughout the year in their bush fields and their yam fields. We have given an

account of the concept of months within a year as seen in Duru culture. This is shown in table 3. Aspects of the temporal progress of Duru agricultural activity, including the temporal development of their agricultural culture, have been shown to be clearly linked to the Duru people's understanding of the divisions of a year, that is, its seasonal aspects.

CONCLUSION

In the above essay, this writer clarified the cultural complexity of Duru agriculture using the methods of ethnological legalistic description. First, an account of the crops which make up the composition of Duru agriculture was given, and the combinations of crops cultivated were analyzed. Then the development of agricultural activities in terms of cultivation techniques was reported and lastly, a description of their tools was set forth.

Thus, the writer can express the two concepts. The first one is the concept of the complexity of agrol-culture on the unit of tribal culture. And the other concerns the cultural historical approach to tribal culture that is leading by the confirmation of the concept above-informed.

In the former concept, at first, it is mentioned that the complexity of agrol-culture is clearly indicated as an index of the tribal culture as shown in Figure 12.

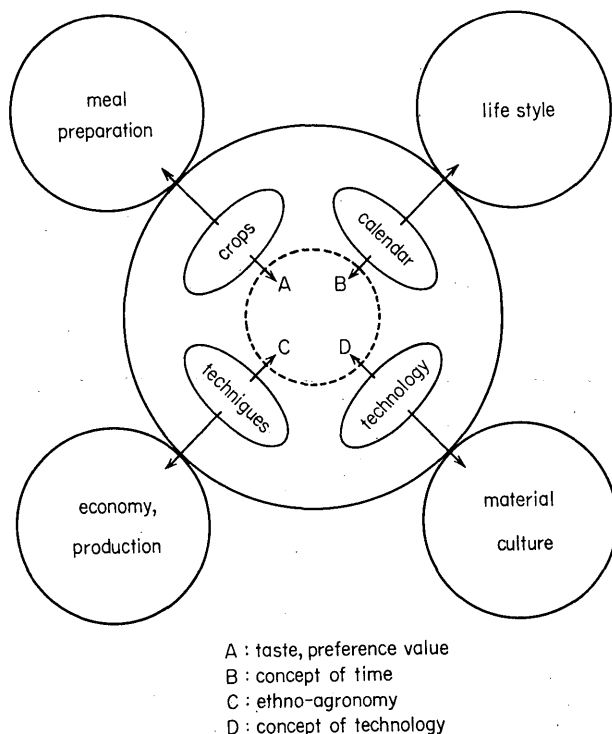


Figure 12. The Relationship of agriculture to other components of culture

Each element of the cultural complexity of agriculture the writer deals with is linked with the subcategories (sub-cultures) of the tribal cultural whole. For example, the composition of crops is related to the cooking and meal culture of the Duru, their agricultural calendar to seasonal life styles, agricultural techniques to production and economy, and agricultural implements to material culture (general craft technology). And then each element of the cultural complexity of agriculture is linked with the core culture (within a dashed line in Figure 12) that is expected to mention the conceptional culture. By this point, the cultural complexity of agriculture being apt to be overlooked, is believed to be effective for an index of ethnic identity.

This then, is to be the basic concept for the cultural historical studies of African culture, that is the latter concept.

Accordingly, looking the case of Duru culture, the above discussion has made clear that there exist two different agricultural system lines within the cultural complexity of Duru agriculture. These have developed in correspondence with the two kinds of swidden fields that the Duru operate—bush fields and yam fields. The agricultural system, within which the bush fields are a part, belongs to the savanna cereal type of agriculture. This belongs to the system of agriculture which has developed in the inland regions of west Africa. The agricultural system within which the yam fields are a part belongs to the root cultivation type of agriculture in which yams are planted during the first year of cultivation. This system is a continuation of the root cultivation type of agriculture which predominates throughout central Africa to the west, as far as the coast at the Bay of Guinea. The complexity of these two systems is reflected in the Duru agricultural tool culture as well. However, if one only analyzes the technical argumentative aspects of the Duru agriculture, questions of what really is the core of Duru agriculture or whether there are any genealogical connections between the formation of these two agricultural systems are left unresolved. That is to say that one can only present these two agricultural systems side by side.

As we have previously seen, the concept of the Duru calendar or rather, the seasonal aspects of a year have only helped advance the discussion one step further towards the solution of the above issues. From the analysis in the fifth chapter, what has become apparent is that seasonal changes and their overall aspects are very strongly tied to the management and operation of bush fields. The Duru people's cycle of daily activities and the cycle of their agricultural affairs are clearly reflected in these seasonal aspects, and are all tied to the cultivation of the bush fields. It is related that the bush fields therefore come closest to touching the core of their cultural complexity of agriculture. To the Duru farmers, the savanna cereal type of agricultural culture, within which the bush fields are developed, is the most basic form of agriculture.

If the above statement is true, one may then ask what the meaning of the root cultivation type of agriculture is to the Duru people. It is apparent that to them, the cultivation of yams is chiefly for the purpose of obtaining cash. However, it does not seem that one can say that this is something which has been established during

recent times. The use of the *tong* as a representative tool, planting involving ridges, early planting and the method of yam cap are methods of cultivation which have developed as adaptations to the savanna environment. They depict the system of yam cultivation. Already, the writer has, at an earlier stage, felt the need to call yam cultivation culture "savanna yam agriculture" as a part of the adaptations to the savanna environment. At the present time, the cultural complexity of Duru agriculture is a union of the savanna cereal type of agriculture which supports a substantive system beginning with main foods, and the savanna yam type of agriculture which has developed as an adaptation to a monetary economy.

The savanna yam type of agriculture as an economic form of adaptation to a monetary economy carries an importance within the Duru social life of the present day. It is assumed that it is of a supplementary nature and has an administrative shape. Its lineage is seen widely distributed throughout central Africa connected to what G. P. Murdock has pointed out as the "yam belt", which at this time is hidden within the deep folds of African cultural history.

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