

Technical Aspects of Gathering among the Central Kalahari San

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1. Introduction

The Central Kalahari San are the Hunter-Gatherer who live in the Kalahari desserts. I have been researching their gathering activities from the behavioral point, such as the analysis of the group formation for gathering, time allocation and efficiency (Imamura-Hayaki 1996). In this paper, I will present the way the Central Kalahari San gather and cook, as well as how to use digging sticks, which are important in gathering.

The Central Kalahari San used to live a traditional nomadic life. But they have now settled in the Xade area. The sedentarization started as a project of Remote Area Development Program by the Botswana government. In 1979, a well with gasoline engine was set up in the Xade area. From 1982, the sedentarization was promoted by rationing foods (mainly corn flour) against a drought. Goats were also distributed by the government, soon after cattle like donkeys and horses⁽¹⁾ were also tamed. People in this area have come to live on cash income from road construction and handicrafts (Osaki 1984, Tanaka 1987).

The influences by the sedentarization on the San's gathering activities are as follows. Firstly, the ratio of gathered plants to the total foods has decreased due to well water and food rationing. Secondly, vegetable resources around Xade have been exploited, as a result many people have continued living for a long time in the same place. The sedentarization

has greatly influenced their gathering activities. Therefore, it is an urgent task to describe the present situation of gathering.

The original data was collected from July 1990 to February 1991 in Xade area within the Central Kalahari Game Reserve, Republic of Botswana. The Central Kalahari San consist of two linguistic groups, | Gui and || Gana. The bold characters in this paper represent | Gui words.

2. Kinds of the gathered goods

Mainly women do the gathering. Women collect not only plants and vegetables but also firewood which is necessary for their daily life. They also collect building materials to make huts and grass to thatch roofs when necessary.

2.1. Edible plants

Tanaka (1980) reported that the pre-sedentary San used 80 species of wild plants⁽²⁾ as edible ones. The research this time observed that 43 species were used and another 16 species, by information. 10 species of the former and 6 species of the latter were not on Tanaka's list and were newly added.

2.2. Firewood, building materials, grass for thatching roofs

Firewood is indispensable not only for cooking but also for warming themselves. After settling down, the more they eat corn flour, the more firewood they need. Women never fail to collect firewood on their way home from the gathering and they fetch firewood even when they don't go gathering.

The most suitable species for firewood is a kind of Acacia such as

Acacia luederitzii and *A. erioloba*. According to the San, these trees contain oil and are therefore flammable. They are ideal for firewood because they continue burning for a long time. However, these trees have been exploited around Xade and are distributed 5 kilometers apart from there⁽³⁾. Therefore people frequently use what they call \neq karu (general term of thin trees), or *Terminalia sericea* or *Boscia albitrunca* whose burning time is shorter.

The San make their huts only with trees and grass, not with wall mud. They prefer straight trunks as building materials. As props, they use such thick wood as *Acacia erioloba* and *Acacia mellifera* and make dome-shaped frameworks for huts. Then they fill in between the props with thin trees such as *Terminalia sericea*, *Boscia albitrunca*, and *Lochocarpus nelsii*, etc. Further, they fill remaining spaces with twisted bundles of soft *Grewia flava* twigs. After making the outward form of huts, they cover huts with grass to prevent sand and rainwater. For thatching roofs, *Stipagrostis* sp. is the most suitable, but *Eragrostis lehmanniana* is also used.

3. Way of collecting edible goods and cooking

The San have a lot of knowledge about what kinds of plants are available when and where. They also exchange information frequently on these plants. As for qaã (*Acanthosicyos naudiniana*), a kind of melon, for example, people talk about each other, "I saw many flowers at a certain place," from around November when it starts to bloom after the first rain. In December, talks are exchanged in the camps observing the ripeness of melon on their way to pick \neq k'on (*Dipcadi* sp.), a kind of wild plant. Based on this information, people decide when and where they should go pitching.

Areas for each camp's gathering tend not to overlap. For example, the women of camp T, which settle down in the southern part of the Xade, use the area stretching toward the outer south of the settlement. However, it sometimes occurs that the members of adjacent camps utilize the same place and meet each other there. Out of the 18 times I visited with the people of Camp T, we met women of Camp A once at the gathering place for | none (*Boscia albitrunca*) berries, women of Camp K and Camp S were also at the gathering place looking for green caterpillars.

In such cases, women of Camp T talked with those of other camps a little and then separated from them naturally and didn't join parties. However, when they met women of Camp K at the gathering place of || k'on, they joined together once.

A. !?om | ke (*Cucumis kalahariensis*)

They dig rhizomes deep in the ground with digging sticks and collect them. The parts on the ground grow leaves only in the rainy season for several months. Roots are edible almost all year round. They grow stretching on the grassland and many daughter corms grow out of a mother corm in a radial form. Therefore, when an !?om | ke is discovered many corms can be dug out one after the other. People like !?om | ke since it doesn't have a bitter taste. But lately it has been exploited around Xade. The way of collecting corms is to dig out sand by 50 to 60 centimeters with digging sticks. After digging several rhizomes, people get them together, tie them at the runner and store them in the leather wrappers.

The way of cooking corms is to roughly slice off their skins with wooden spatulas, throw them into a burning flame and then bake them black for a couple of minutes or put them into hot sand under a fire and roast them for about 2 hours and eat. The former way of cooking is

called ꞑkan and the latter, ꞑkoõ. There are three traditional ways of cooking for the San without using a pot ; adding to these two methods mentioned, there is the other way of cooking called ||ʔom, roasting with a strong fire.

In the evening, they roast several !ʔom | kes and | kaas (I will mention it next) in the hot sand under a three-legged cooking pot used for corn porridge and dig them out to eat at the next morning.

B. /kaa (*Coccinia rehmannii*)

They eat rhizomes like !ʔom | kes. Unlike !ʔom | ke, | kaa are not distributed in only one place but are discovered independently at the root of the tree. In seasons when the part on the ground are developed, runners twine themselves round the tree. Grown roots are full of fiber and do not taste good, so younger small roots are preferred. The way to prepare | kaa is the same as that of !ʔom | ke.

C. | none (*Boscia albitrunca*)

| None bears sugar-abundant⁽⁴⁾ yellow berries with diameters of 1 centimeter after blossoms. The case of a rich harvest is rare with only one in several years. December, 1990 was the year of rich harvest but was exploited in only 10 days. The way to process | none is unique. They suck the berry they picked and throw away its skin. When 10 berries are collected in their mouths, they spit them into cups with saliva. (A series of this action is called kara.) They repeat this action and collect berries with seeds in containers and return to the camps. Containers of berries are left for several hours in the sun, so that berries become ferment and taste sweet-sour. After that they separate seeds from berries by stirring with twigs and drink orange-colored, sweet-sour juice.

D. ꞑk'on, | gara, || ?aagubo (*Dipcadi* sp.)

As for ꞑk'on and | gara, they eat their leaves raw. As for || ?aagubo, they eat its bulb raw. All of them are distributed at the old sight of the ancient river, called molapo. They grow green leaves in the rainy season from December to February. ꞑK'on sprouts earlier, while | gara and || ?aagubo sprout later. They pick ꞑk'on and | gara on the ground and eat only leaves. They taste light and are sticky, peculiar to the lily family. Sour-tasting wild plants like ꞑnao (*Oxygonum alatum*), || gabe (*Talinum arnotii*, *T. crispatum*), and || ?aabere (*Kleinia longiflora*) are also collected at the same time and mixed a little of the same seasonings. ꞑK'on and | gara took back to the camps are pounded with pestles. ꞑ?Oori (*Ximenia caffra*), the sour-tasting berry, is added as a seasoning rather than ꞑnao and || gabe.

E. qaã (*Acanthosicyos naudiniana*)

Qaã (wild melon) fruit becomes ripe about 2 months after the first rain. When eaten raw, there is a tongue-piercing stimulation (chori⁴). Therefore, it is common to be eaten after it is cooked in the camps. If eaten raw, qaã fruit should be rubbed with the leaves of | gaa (*Terminalia sericea*) allowing for the stimulation to be lightened.

They bake qaã with direct fire or roast it with hot sand and then sip (| koru) only the fruit, leaving skins. The most popular way cooking this food is to pound (ꞑkari) roasted fruit with seeds, and kx'oam (*Grewia flava*) is then added for sweetness. Both qaã and kx'oam become ripe at the same time and those who collect qaã also try to collect kx'oam.

F. || nan (*Citrullus lanatus*)

After the first rain, sweetness watermelons also become ripe in 2 months. Since they grow wild from the seeds people throw away around

the camp, at present they are collected within the village. However, when all watermelons around Xade are exploited in several months, people go gathering away from camp. || Nan are covered with thick skin and are in the bush without decaying or drying. However, by July, they are exploited within the gathering area where people can collect them in a day's trip. Juicy || nan taste light and can be eaten raw⁽⁵⁾. Raw fruit is eaten by being dug (≠karo) with sticks or roasted with hot sand or boiled in pot, mixed with kx'oam and pounded (≠kari) with pestles. Sometimes they make porridge by mixing fruit pounded by pestles and corn flour and then boiling them all together⁽⁶⁾.

When || nan bear a lot of fruit, they throw away the fruit and collect only the seeds (this way of gathering is called !nhaa) and take them back to the camps. Seeds are roasted with a strong fire and then pounded with pestles to make flour which can be eaten.

G. kx'oam (*Grewia flava*), || qx'ane (*Grewia retinervis*)

Short trees of about 1 meter high bear brown berries with a diameter of 8 millimeters. Kx'oam bears fruit around December and || qx'ane bears fruit later, in February. By April or May, they are exploited within the gathering area where people can collect them in a day's trip. They go gathering overnight until June or July 7). They pick up qx'oam and || qx'ane by their hands and put them into their bags hanging from their necks 8). They eat the fruit raw and seeds inside of it. Or they take them back to the camps and dry them for preservation. They use kx'oam and || qx'ane as sweeteners to give a flavor to qaã and || nan. They sometimes use them in order to make alcohol.

H. ≠nan≠ke (*Bauhinia petersiana*)

Peas become ripe from February to May. At gathering places, they

move their place picking peas with shells. They roast peas with shells or roast only peas. They eat cooked peas as they are or eat them after pounding with pestles to make them powdery and then eat them. When dried, peas are preserved and the pea powder is used for rituals of menarche and weddings.

1. gyuu!noo, †nao!noo (green caterpillars)

Larva of capidoptera. The gathering period is only 1 week or so when caterpillars become chrysalides after hatching. Gyuulnoo are green caterpillars, 7 to 8 centimeters in length and feeds on the leaves of †qane (*Ipomoea* sp.). †Nao!noo are green caterpillars with 4 centimeters in length and attach themselves to the leaves of || qx'amts'a (*Lonchocarpus nelsii*).

Gatherers move slowly from place to place looking for caterpillars. When they catch caterpillars, they tear the caterpillars' head off and squeeze out the contents in their stomach (ts'aa means to 'squeeze water'.) They then cook them by roasting the caterpillars with a strong fire.

4. How to use the digging sticks

Digging sticks (†nua) play an important role in the gathering activities. Sticks are straight with a diameter of about 2 centimeters and a length of 90 to 100 centimeters. They are made of flexible and strong wood like *Grevia flava*. These sticks are made by men for women, as well as mortars and pestles. Men fetch thick wood, peel the skin and make wood more straight by heating it over fire (zao). Then they make sticks by cutting diagonally one side of wood with a knife. Women, who are actual users of the sticks, sharpe the points of them (|| khaa) after using.

Digging sticks are indispensable not only in digging roots of plants, but

also in all activities in the bush, including gathering and hunting.

A. Digging

In digging rhizome of plants as a gathering activity, they dig with digging sticks in both hands depending on the thin runners. When they dig deep holes, they can dig deeper by using their hands to eliminate sands digging by sticks. When men set a trap in hunting, they make pitfalls with digging sticks. When they hunt spring hares, they dig deep holes with their sticks. They also use these sticks in digging holes for the pillars of huts.

B. As a substitute for hands

When they collect fruits too high for hands to reach, they fetch them by drawing them near with digging sticks. When they collect qaã melons, they pick them up by piercing them with sticks without bending themselves⁽⁷⁾. They also use sticks in adjusting loads carried on their backs, or in picking up things that have fallen to the ground during their trip. Also they thrust sticks into caves to get sap or small animals like birds or mice.

C. Chopping

In passing Acacia wood, they make a path by chopping thorny twigs with digging sticks. They also collect firewood by chopping withered twigs with sticks.

D. As a stick

When they carry gathered goods on their backs with headbands^{(8)*}, they shift their weight forwardly. They stand up by using digging sticks. When they have a break under a tree with loads on their backs, they lean

against their sticks to disperse their weight. Also, elderly people, in particular, move using digging sticks like walking sticks.

E. As a cooking utensil

When they eat wild melons, they cut them in halves by using the digging sticks and then hollow out the fruits with the sticks to eat. Or they will drink the juice after breaking them open with the sticks. When they cook || nan melon in casseroles, they divide the skins and fruits with digging sticks, not with knives.

F. As a weapon or hunting tool

When they encounter such vermin as snakes or scorpions, they club these vermin to death with their digging sticks. Or when they (both men and women) run after young diker and catch them, they club these animals to death with their digging sticks. When men kill animals that are trapped, they club the necks of the animal with the sticks.

5. Discussion

5.1. How the gathered goods were changed by settling down

Tanaka's (1980) data was documented when the San lived a nomadic life and compared with the current data, changes can be observed in utilizing plants in the past 10 years. Tanaka listed 11 species of plants as a major food possessing significant parts of food in some specific seasons, 10 of which except *Tylosema esculentum* are popularly utilized even now. *Tylosema esculentum* is too remotely distributed to be utilized, distributed only 40 kilometers north from Xade area. These 11 species were selected as a major food because they are abundant, easy to be collected and carried, tasty and have high nutrition value (Tanaka 1980). It can be

inferred that for this reason, they are still popular now. The preference toward species show by the San hasn't changed much even after the sedentarization.

Comparison of the parts the of plants utilized between the pre- and post- sedentarization has shown that rhizomes have decreased from 14 species to 5 species. People used to squeeze juice or take starch from rhizomes, but now wells and flour have replaced them. Wild grass listed by Tanaka (1980) whose leaves and stems are edible, now has only 4 species out of 11 that are utilized. However if the newly observed 8 species are added, 12 species are now utilized and relatively well eaten. They are easily eaten raw and seem to help supply vitamins and minerals.

The San's preference toward wild plants hasn't changed greatly, but it can be said that their nutritive position in the wild plant diet has been changed between the pre- and post-sedentarization.

5.2. How the San cook

The San know the fitting way to cook every plant very well and even know the way to remove harshness. They season food by using wild plants mixed with acid to give a sweet taste. Especially before they settled down, salt and sugar were so valuable, that people could use only wild plants as seasonings and to sweeten.

Among their way on cooking, it is so unique to roast the food by using sand. They use the above way not only to bake melon and roots, but also to roast meat. By using the way of cooking, they don't need water because the water in the food itself is turning out just as well. They also can cook easily without any tools like a pot or a casserole, and even cook very well. The only weakness to their method of cooking is that they have to collect a large amount of firewood to make a fire.

Mortars and pestles are very important for the San to process wild

food. They pound baked melons and roots, parched beans and nuts, dry fruits, fresh leaves, stems, and bulbs to make fibers soften. They also use the mortars and the pestles when pounded with dry meat. They have two kinds of pestles ; one for vegetables and another for meats. The pestles for meats have blades to cut meat fibers. Due to the Mortars and pestles, people can eat large kinds of plants and animals, and make the food soft and tasty.

Three-legged pots seem to have been used by the San for such a long time. They used to, however, be very valuable and were possessed by only a few. The pots were too heavy to carry in San's nomadic life. And the way to bake using sand, was suitable to any food. People did not need the pots so much, before. After settling down, the San came to live on rationed corns flour and the pots became necessary. Corn flour has to be cooked into porridge in the pots, otherwise corn flour cannot be eaten. Though almost all of the gathered food can be eaten raw, rationed food must be cooked. This difference caused the San to need pots and kettles and then they engaged in collecting firewood everyday.

5. 3. The possibilities caused by the digging sticks for human evolution

The significance of digging sticks was insisted by Nishida (1974) in the ecological viewpoint of utilizing rhizomes. A few non human primates, for example chimpanzee, also use tools. But they can't use rhizomes, deep in the underground. Only human beings can use rhizomes by using digging sticks.

Tanner and Zihlman (1976) also asserted the significance of digging sticks in the evolution of mankind, indicating the importance of gathering activities in the evolution of mankind, as an anti-hunting hypothesis. Zihlman (1981) insisted that the old era's organic tools were hard to remain, so that digging sticks were to be neglected even though they were

critical for human evolution. McGrew (1981) insisted that females must have promoted human evolution with using tools, pointing out sex difference of chimpanzees in using tools.

Kawai (1992) cast a doubt over 'rhizome theory' in that the Pigmees, who seldom utilize underground part of plants, also use digging sticks. The way of using digging sticks is diversified, not confirmed to digging rhizomes in the gathering activities, as I mentioned in this paper. The diversified technique of using digging sticks has the possibility to add a new viewpoint over the issue of tool-using early mankind.

Notes

- (1) Since Xade area is in the game reserve, intrusion by cattle is prohibited.
- (2) As for the description of plants, following classifications are made.
 Grassroots (**tsao**), Roots of trees (**‡qai**), Stumps of trees (**‡kuri**), Branches (**|kam**), Leaves (**gyana**), Fruits (**‡?eru**, which also means 'body' or 'truth'), Runners (**||?oã**, which originally means 'arms')
- (3) Concerning geographical features, the following expressions are made.
!?ae for molapo (depleted streams in the Kalahari desert), **!koo** for pan (flat, dried lakes shallow in depth) with water in the rainy season, **!nam** for pan without water around **!koo**. Also, concerning vegetation, **‡khaa** for grasslands around pan, **!koi** for plains of plants of rice family, **||kau** for woods of *Acacia leuderitzii* (also indicating woods in general), **||kari** for woods of *Acacia mellifera*, **|gui** for woods where *Lonchocarpus*, *Boscia albitrunca*, *Ochna pulchra*, and *Terminalia sericea* grow together.
- (4) Other expressions for the sense of taste are as follows.
 'Sweet' or 'Tasty' (**qare**), 'Unsavoury' (**xon**), 'Bitter' or 'Saltry' (**qx'au**), 'Sour' (**||kam**)
- (5) They say that they *drink* (**qx'aa**) **||nan** melons, but they never say that they *eat* (**‡?on**) them. They say **qx'oo**, which means to eat meat.
- (6) **!kam** means to cook melon or corn flour with pots, while **|nua** means to cook meat with pots.
- (7) **||nan** melon is too big to pick with digging sticks. Also, its skin is too thick.
- (8) There are two types of carrying goods by women. One is **|kaba** : carrying goods overhead and the other is **||kaya** : carrying goods on the back with head bands.

The former is adopted by younger girls, while the latter is adopted by women of middle age.

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