

## Annex 11

### LOCAL AND INDIGENOUS KNOWLEDGE SYSTEMS

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Africans have been living in this continent for several millennia. During this time they developed knowledge and systems that were and still are necessary for their survival. My brief paper will touch on Health, and other topics since indigenous knowledge was not classified along Modern disciplines.

#### **A. HEALTH**

##### **Disease management:**

In some African groups such as the Agikuyu, there were two categories of diseases:

- (a) Diseases caused by supernatural events such as mental illness and any other disease of unknown natural cause. ( “Murimu” in Gikuyu). Breaking religious laws or “taboos” also caused such diseases.
- (b) Diseases whose causes were known such as infectious diseases (“Nduari” in Gikuyu). Injuries and fractures were also included in this category.

Supernatural diseases were treated through divination and magical or religious ceremonies including exorcism. There were professional practitioners who specialized in such treatment. These were known as “Ago” in Kikuyu. Prof Violet Kimani did her PhD in Medical Sociology on them. Some of them have been reported to possess quite impressive “powers” especially in the area of knowing their clients thoughts if the client has time to allow such a practitioner to go into a sort of trance and communicate to the client in that state. The powers of predicting the future that such practitioners claimed were however not proven to be reliable.

Natural diseases were treated by herbalists and/or surgeons. Herbalists used specific preparations for specific disease conditions. The list of conditions which were treated by herbalists is quite long. However the following medical conditions are still treated very successfully by herbalists.

- (a) Asthma
- (b) Some forms of arthritis
- (c) Some forms of female infertility
- (d) Prostatic enlargement – indeed one of the plants, *Prunus africanus* a highland tree whose bark is used is now almost extinct because of its high demand in Europe.
- (e) High blood pressure
- (f) Wounds – healing by covering with plant extracts or juices
- (g) Some specific skin conditions including herpes zoster.
- (h) Throat infections
- (i) Dyspepsia

Surgeon treated injuries and any other diseases such as swellings which needed surgical treatment. Some surgical conditions were only treated by a surgeon who had killed a leopard. Apparently special bravery was required in such cases. For very painful conditions, alcohol was used to dull the pain. Pain and fear and anxiety could also be suppressed with a special plant brew from a specific mountain tree. This has been found by some modern researchers to suppress pain without causing drowsiness. No wonder the Maasai soldiers used to take this brew before a lion hunt

Surgeons sutured wounds according to how fresh the injury was. In different parts of East Africa, there are special herbs such as Aloe vera that were applied to the wounds to help in the healing process. Some of these herbs have such a sticking property that they hold onto the new healing tissue as it forms thus keeping out or removing the infections. In Buruli County in Uganda (Thairu K 1975) and in parts of central Kenya such herbs have been known to traditional surgeons. In hand surgery some of these herbal dressings have quite a dramatic healing effect which I witnessed recently in a case where a very common highland weed was used.

Traditional herbalists have done their best to protect their intellectual knowledge but some of it has leaked to the “West” as is the case for *Prunus africanus*. However with proper safeguards, the examples given above can be researched through collaboration between indigenous and modern scientists.

Fractures were treated by bone setters. For simple fractures, their method of reducing the fractures and then pushing the broken ends of the bones into each other and holding the fracture site steady with special barks of trees used to produce very fast healing of the fractures indeed. This technique was later adopted by modern Western orthopedic surgeons as a “new scientific development” in orthopedics.

In Western Uganda, successful “Caesarian sections” were carried out by surgeons on special cases (Felkin R.W., 1884). These were recorded by some of the earlier European visitors in the 19<sup>th</sup> century.

Craniotomy was also performed by some surgeons for intractable headaches and also for other “head” illnesses. The surgeons of Gusii in Kenya were documented as having performed such operations with no recorded facilities. The author had obtained photographic evidence of this in mid 1970s. The procedure was witnessed by members of the Medical Profession who took these photographs.

Immunization was also practiced especially by the Maasai for the prevention of animal lung infections. The scientific management of Small Pox, including preventive measures and immunization was practiced by the Kikuyu. This was documented by the European Anthropologist, (Leaky L.S.B., 1977). This included quarantining the infected in special huts and using those who had recovered as care givers who looked after the sick ones. These care givers, who had survived the disease, then conducted immunization with a technique that was totally unknown to western medicine. They took fluid from the skins of their patients who were almost fully recovered in special leaves and using the thorns of

special trees as lancets, inoculated the healthy population through skin scarifications. Those so inoculated got a very mild attack of small pox and also became immune.

Midwifery was well developed in most of East Africa. Turning the baby in the womb so as to correct its position and aid normal delivery was widely practiced. The administration of herbs that make the uterus contract to aid delivery was also widely practiced. Some of these herbs have been studied and work on at least one of them (done by Dr. N. Mugo) was awarded a Ph D. by a U K university and a patent obtained for one of the herb's ingredients.

In addition to the above public health knowledge applied to infectious diseases, some of the groups regarded stagnant water harmful to health and forbade people from drinking it. Flowing water was however regarded as "safe".

Food laws and taboos among the Maasai and the Agikuyu were common with Hebrew laws and had a strong bearing on public health. Eating of diseased animals was forbidden. The Maasai however had a way of immunizing people against anthrax and people so immunized through very prolonged process could take meat infected with anthrax with impunity. Animals which were regarded as "unclean" by the Maasai and the Agikuyu are the ones which can carry very serious killer diseases, for example trichinosis and pigs and herpes and monkeys. No wild animal was eaten since by the food rules of these two groups argued that since no one knew what wild animals ate, one was never sure that they had not eaten unclean things. Thus herding domestic animals had an added public health importance.

When bubonic plague hit the Central highlands of Kenya, one of the measures taken by the communities was the burning to ashes any homestead which had a plague patient.

The handling of the dead had a lot in common among the above two groups and the Hebrews. Again the laws had health basis.

Lack of hypertension (recorded in scientific medical literature) in the local population before "Europeanization" is being slowly understood as the Africans in Eastern African region had developed a dietary regimen which made blood pressure fall with age after adulthood. For example, Sodium chloride was only fed to animals not to human beings. Humans used papyrus reed salt either in crude form or as a purified product. Western manufacturers are now marketing a "salt" which is almost similar to African papyrus salt.

## ***B. ENGINEERING***

African metallurgy was developed for the manufacture of implements, weapons and ornaments. Some of the scientific processes developed and documented at the beginning of the 20<sup>th</sup> century are listed below (Routledge 1910):

- (a) Constructing a charcoal fire so as to produce a heat multiplier effect thus allowing temperature hot enough to smelt iron oxide without coal. This process was to be patented later by the USA Physicist, Dr Lawrence Cranberg, the inventor of the

- “Texas Fire Frame” (Jones and Burch, New Jersey), since the Africans did not file a patent – it was not the practice in their legal system. All one needed to do so as to access the information was to be initiated and apprenticed to a particular manufacturer Purifying iron ore through a panning process as is done for gold. This was done by the miners who in central Kenya (Nyeri) were women.
- (b) Making wire of predetermined thickness using special tools and a pulling process. This process the “cold process” as is called by western engineers is still used in modern technology.
  - (c) Manufacturing specially crafted soft iron, steel, brass copper and in some places, gold ornaments and objects. These varied from tools to ornaments.

### **Clothing :**

In colder climates Africans had developed the skills in softening leather and tailoring leather clothes and ornaments. These varied from soft undergarments to tough capes. For decorative garments, techniques in making fur cloaks had been developed. Rock hyrax, colubus and vervet monkey for cloaks were specially valued. Some of these garments had ceremonial or status value such as pure black calf fur cloaks for some elders. Some groups in Uganda used bark cloth for making clothes. In the Congo elegant clothes were worn by Africans before western influence set in (Davidson,1970).

### **Construction, building and irrigation:**

- (a) Building with stone without mortar was well known in some groups. The great Zimbabwe in the Kingdom of Mwana Mutapa (“Monomotapa”) is a good example.
- (b) Irrigation works were used for ages in parts of East Africa. The ruins of Engaruka in Northern Tanzania are several centuries old. Irrigation is still the norm in the slopes of Mount Meru and Kilimanjaro in Tanzania.(Davidson, 1959)

### **C. ENVIRONMENTAL CONSERVATION:**

Highlanders in the mount Kenya region had developed very strict rules of environmental management and awareness. They believed that plants were the original owners of land. The highlanders seeking areas to cultivate therefore only cleared the bushes but only some of the trees. Before the cleared bushes and trees died they held special prayers and ceremonies in which they requested the cleared trees and bushes to please let their spirits entre the bodies of the trees which had been spared and give the highlanders permission to use the land for their own sustenance. The trees which had been left standing were found dotted all over the highlanders shambas. These trees were termed “mirema kiriti” literally “the resistors of the original forest”. They were treated with a lot of respect and if they grew very old and weak, they were propped up. If they fell, they were replaced with at least six young saplings. The first Europeans to visit the Kenyan highlands used to say that “the Kikuyu Lived in Forests” and some got concessions to harvest the huge sacred hardwoods found there. “Slash and burn” and “Shifting Cultivation” and other forms of

“primitive agriculture” of the colonial text books were not allowed in the highlands before European influence.

Local communities had a special relationship with trees and nature. In Ukambani, Kitui hills were densely wooded. A book published on the environmental changes in Machakos shows that as the Wakamba increased in population, so did the forestation and environmental care (Tiffen et. al. 1994). The equating of population growth with the destruction of the environment in Africa is not necessarily a result of indigenous practices. More often than not, it is a result of modern belief systems and commercialization.

#### ***D: COMMUNICATION:***

- (a) Picture writing was a secret skill of the Agikuyu minstrels. Examples of this writing were recorded by Routledge who wrote of Kikuyu “professors” of picture writing between 1902 and 1904. A catholic missionary also described it. A few Kikuyu still know the code.
- (b) In the Cameroons, a form of shorthand is said to have been developed for the first time in the world. (Davidson 1970)
- (c) The Miji Kenda people had a writing which antedated the introduction of both the Arabic and Latin systems. (Davidson, *ibid.*)
- (d) Many craftsmen have specific symbols for individuals or clans. The meaning of such symbols is all but lost to the modern African.
- (e) The classical Akamba carvings had meanings that seem to be lost now. Some of these carvings depicted people with crowns like those of the Pharaoh’s of ancient Egypt. Tourist pressure has wiped this style of carving except for some odd reasons in the case of paper knives.
- (f) In mathematics some of the groups had developed a “base ten” system while others had developed a “base five” system.
- (g) In geometry the three basic shapes i.e. the circle, the triangle and the square were known but used mainly as religious symbols.

#### ***E. ASTRONOMY:***

Astronomy was developed to the level of astrology. Seers and the priests who for example go to sacrifice to God on mount Kenya knew about the planets i.e. the “Seven Stars” and made a lot of the astrological meaning of the alignment of the seven stars. The Samburu people still have notable astrologers among them some of whom have been written about. Indigenous astronomy and astrology has been very poorly documented Although Christian tradition has it that one of the three wise men was a “black” African.

#### ***F. FOOD SECURITY NUTRITION AND TRADITIONAL KNOWLEDGE SYSTEMS:***

The author knows the Agikuyu system best and therefore it will be described briefly. Food crops were controlled by the married women. For this reason at marriage the new

bride was allocated a piece of land which the men of the clan open for her and prepared for planting. She then planted and weeded her crops with the help of a communal system called “Ngwatio”. The men also constructed for her granaries made of wicker work which allowed free circulation of air. All the crops which she grew were stored in her granary and only she could give the food out. A man who got into his wife’s granary was fined heavily by the elders as food belonged to the women. Men owned the domestic animals but there were special conditions attached.

At marriage for both Kikuyu and Maasai, the new bride was given some animals and she was very choosy on which ones she accepted. Should she have children later her children helped in the herding of these animals with the hope that they would increase. Such animals were used as currency in paying for the bride price for her sons in later years although it was the husband who executed all the paying since he provided most of the animals needed.

To ensure food security, the following measures were taken:

- (a) Yams were the only crop planted and looked after by the men. They were regarded as famine foods. This was because unlike other root crops, yams can be left in the ground for as long as possible; they only grow larger with time. The man therefore would only be requested to harvest some of his yams if the family was on the verge of starving.
- (b) To avoid grain shortage, each woman stored enough grain for her own household and her husband and for trade.
- (c) Seasonal crops which could not be stored were used as “grain savers”. These were sweet potatoes, mainly and arrow root to a small extent. When sweet potatoes were in season they were used for every meal so as to save grain. The women of those days could even make sweet potato porridge. A little Arrow root was also used to break the culinary boredom. Once these seasonal crops were finished, the woman put the family back on grain-based energy food. No less than thirty six different grain dishes could be prepared by the Kikuyu woman of those days.
- (d) Kikuyu land has lots of rivers there is hardly any valley which does not have a riverbed. These river beds have holms that were permanently covered by arrow root “shambas”. Arrow root was not used during the wet season. Whenever there was severe drought, the only areas which remained moist were the holms and so arrow root remained healthy despite the drought. Measured quantities of arrow root were then harvested and cooked to sustain the family until the rains returned.
- (e) If famine threatened, the men were asked to provide some yam.
- (f) When the rains returned, the Kikuyu had a type of amaranth which matured in just two weeks. This was the food used to end the famine.
- (g) For well-to-do families, honey was used to preserve meat. The meat was fried in fat first and then without handling by hand put into honey containers which were filled with honey and closed. This honey meat “Rukuri” was one of the most delicious food in Kikuyu country especially when there was famine.

- (h) Meat was also preserved by smoking but this was mainly used for preserving fat meat used for preparing snuff but also for giving young children in special occasions.
- (i) On a day to day basis, the kikuyu woman cooked once a week. She had evolved a composite meal (“Irio Cia Ngimo”) containing all the three basic nutrients, protein (beans), starch (grain or green bananas), vegetables (over a dozen to chose from). These when prepared properly and made into balls (“mataha”) could be preserved in airy trays in the granaries and kept for a week in the cool highland climate. One ball was adequate for one person for each meal. The woman would know who needed more or less. She also made allowances for visitors and for small children of her co-wives if any. In addition to this, fruit was plentiful in the forests (wild fruit) and in the fields (bananas).
- (j) The head of the household had to provide meat for the family at least once or twice a month. Rams and he goats were the usual source of meat except during ceremonial feasts. Each member of the household got more or less the same quantity of meat. This situation was guaranteed by the fact that each gender and age group had specific cuts of meat. Denying any gender or age set, e.g. the young girls, their cuts of meat was a punishable offence. The elders court would fine the head of the household a whole ram of the goat which the young girls would consume alone with their friends from the clan. In such a case all the cuts were given to the girls. This rule of specific cuts applied even when men went for barbeque in the forest. They still had to ask one of the wives of the household to come and fetch the cuts fore all those absent. These measures ensured that no one was deprived of proper nutrition. It was only the uncircumcised boys who on the whole had tougher meat (necks) but the correct quantity was there.

As the above information shows there were systems for ensuring food security and equitable nutrition for all the members of the community. The origin of modern inequity in food distribution within family units in this part of the world is therefore alien.

***G. INTERNATIONAL RELATIONS AND WAR CONVENTIONS (Refer to Leaky, 1977 also):***

- (a) At least in parts of Kenya, treaties had been developed between the Maasai, the Akamba and the Agikuyu which forbade taking territory by military conquest. Land had to be bought and the instruments of the sale exchanged in the courts of both the tribes concerned so as to make the sale agreement mutually binding.
- (b) There were very strict war rules between the Agikuyu and the Maasai. One never killed an unarmed man or an armed man who was facing away. Women and boys were never killed. If one killed more than one person in one charge he would have to give a very good account of the necessity to kill more than one person.
- (c) Any warrior who had killed the enemy was praised but never allowed to entre any ones house until he was cleansed of the “sin” of shedding human blood. Victory songs always had words of mourning for the victims mother’s loss.

- (d) Arson was forbidden.
- (e) Slavery was utterly forbidden in Maasai and Kikuyu lands. And so was any form of servitude including employment. Only contract work for commission was allowed. If a man was captured by force of arms he became his captors brother. This was done for the sake of obtaining male heirs. Such captured brothers could be redeemed by their tribe if they so wished. If a warrior captured a woman, she became her sister and was taken to his home as such. Suitors would then have to approach the family in the normal manner for any girl in the family. For this reason no slave caravan ever survived in Kikuyu or Maasai land.
- (f) In recorded history, when a neighbouring group tried to take Meru country by military conquest, Maasai Agikuyu and Akamba combined in an international force and drove the invaders back.
- (g) Married women were immune from any travel restrictions and traded across the three groups freely sometimes crossing war zones where their men were engaged in deadly combat.
- (h) All travelers were offered safe passage. Trade was therefore common from lake "Victoria" (the "Sea of the Jaluo" to the Highlanders ) to the "Indian" ocean ("Sea of Gicua" to the Highlanders).
- (i) The Kikuyu and the Akamba were forbidden from shedding each other's blood on account of their origin.

I have added the socio-cultural dimension to the document so as to give the context of the human environment under which the science and technology was developed. International relations were also very important because they allowed for co-existence of very disparate cultures. This is attested by the fact that genetically Africans are the most varied human beings in the world. Genetically non-Africans are very similar to each other.

In this connection the causes of genocidal civil wars since the arrival of non-Africans need to be studied scientifically.



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