

FARMERS' STORIES FROM KAMULI

groundnut knowledge, recipes
and everyday life





Farmers' Stories from Kamuli: Groundnut Knowledge, Recipes and Everyday Life

Dr. Maria Elisa Christie,
Program Director, Women in
International Development,
Office of International
Research, Education, and
Development (OIREd) at
Virginia Tech, and Principal
Investigator (PI) for Peanut
CRSP VT 134

Peace T. Kyamureku, Secretary
General for the National
Association of Women
Organisations in Uganda
(NAWOU)

Dr. Archileo Kaaya, Associate
Professor, Department of
Food Science and Technology,
Makerere University and Co-PI
for Peanut CRSP VT 134

DESIGNiT, Ltd.

Kampala, Uganda: 2010.

TABLE OF CONTENTS

Acknowledgements	iii
Introduction	1
National Association of Women Organisations in Uganda (NAWOU)	4
Women Empowerment	6
Kamuli District	7
Groundnut Information	8
General Aflatoxin Information	9
The Life of a Groundnut	15
Stories of Planting, Harvesting, Drying & Sorting	17
Stories of the Uses of Groundnuts	30
Recipes	33
Lessons Learned	40

ACKNOWLEDGEMENTS

Special thanks go to the Bulogo farmers from Namwendwa Sub-County, Kamuli District, Uganda who contributed stories, maps, drawing and recipes for this project. These include but are not limited to:

Esther Walubo, Mukaaya David, Bakoby Prossy, Yosefina Waiswa, Sooka James, Mwase Samuel, Kafuko Margaret, Namuwaya Ednansi, Kateme Betty, Kwabye Alice, Josephine Mwende, Nabirye Merab, Mutabiro Viriano, Mwase Scovia, Naikoba Esther, Nankwanga Rose, Topista Kafuko, Yingula Specioza, Kawuma Ednansi, Nangobi Mwase, Kisambira Madalena, Margaret Ziraba, Bwanga Irene, Nabirye Margret, Magala Jane, Nabirye Jamira, Namwebya Betty, Magira Jackson, Andrew Isabirye, Mutabiro Herbert, Kalulu Ronald, Kawuma Edisa, Lovisa Kabuula and Lovisa Mutabiro.

We also wish to recognize the many other farmers who participated in our workshops on gender, groundnut and aflatoxins throughout the year.

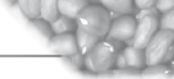
Thanks also to NAWOU officers Mrs. Monica Nayenga, district chairperson for Kamuli; Mrs. Esther Walubo, group chairperson for Bulogo women's group; to Barbara Masette, NAWOU credit officer and special assistant for this project; and Ms. Immaculate Agedo, Immelda Kekimuri, NAWOU volunteers.

This book was funded by the United States Agency for International Development (USAID)¹.

The drawing on the cover was provided by Mrs. Esther Walubo.

¹

USAID ECG-A-00-07-00001-00.

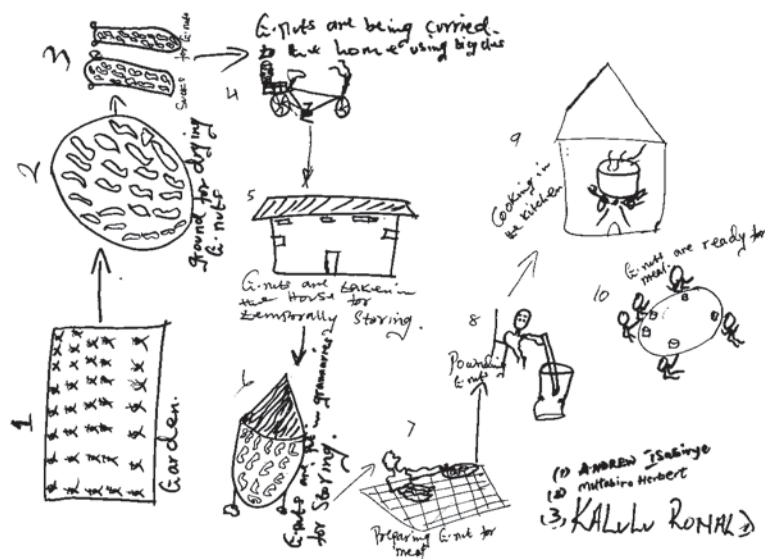


INTRODUCTION

This publication is the result of the hard work of the women and men farmers in Namwendwa Sub-County, Kamuli District, Uganda. It is a labor of love, reflecting the care they take producing and handling their groundnut, or peanut, crop and preparing it for their families to eat. It began in August of 2008 when scientists from Makerere University and Virginia Tech visited Kamuli with representatives from NAWOU, the National Association of Women's Organisations in Uganda, under the auspices of the Peanut Collaborative Research Support Program (Peanut CRSP).

This Peanut CRSP project (VT 134) is led by Virginia Tech in the United States of America in partnership with Makerere University in Uganda, and with the Kenya Agricultural Research Institute and ICRISAT in Kenya. It works to improve the health and livelihood of people in East Africa by addressing aflatoxin and gender-related constraints in peanut production, processing and marketing. Aflatoxin contamination is a major health problem in Africa. This research builds on women's existing responsibilities and concern for family health and nutrition; it involved women and men identifying opportunities for addressing aflatoxin contamination in home storage and food preparation. Through participative research and local partnerships, researchers were able to learn directly from the farmers as well as farmers from the researchers.

Virginia Tech and Makerere paired up with NAWOU to carry out trainings and workshops targeting women farmers with the goals of empowering women and strengthening women's networks as well as educating the community as a whole. They held several focus groups to discuss the hazards of aflatoxins contaminating their groundnuts and what farmers could do to address this problem. NAWOU and Makerere held several follow-up workshops. The farmers drew maps showing the "path of the peanut" from the field to its final destination: the plate, the market or the field. They described the roles of women and men along this path, taking both productive and reproductive activities into account.

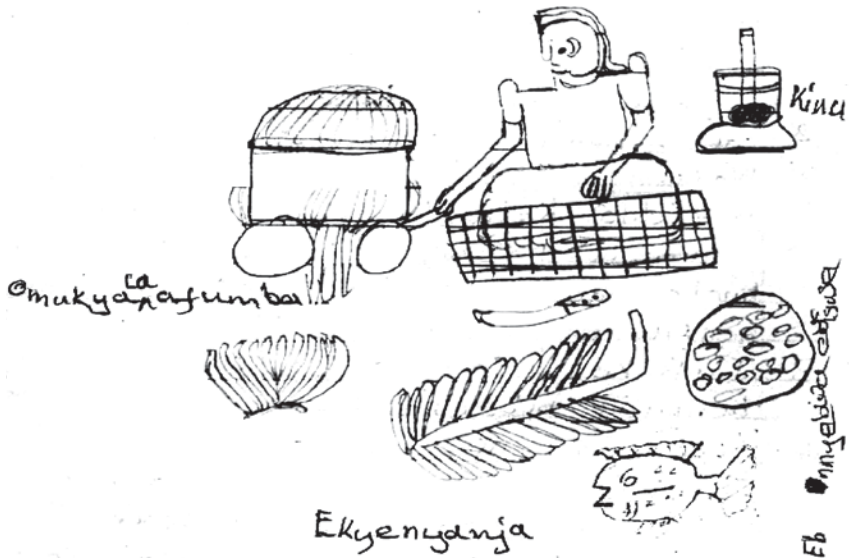


Participative map drawn by men of Kamuli, August 2008.

The farmers were left with blank notebooks, pencils and pencil sharpeners and asked to record their recipes, experiences and draw maps that would help scientists understand the importance of groundnuts in their everyday lives and culture. Guided by NAWOU, 26 exercise books were collected over the next few months, which NAWOU then transcribed and translated. The result is this collection of recipes, stories, maps and drawings describing post-harvest activities and preparation of groundnuts that comes directly from the Kamuli farmers.

Only a sample of what was collected in the farmers' notebooks is included here, but we thank all who participated in the initial activities and the writing and workshops that followed our first visit. We hope that this book is informative and useful in disseminating information on the proper procedures for preventing aflatoxins, and that it shows the importance of groundnuts to the people and culture of this region. This publication seeks to give something back to the people of Kamuli of which both young and old can be proud and that they can use to teach others about aflatoxins and healthy practices.

While the farmers wrote primarily in Lusoga, we have translated their words into English and include a poster in Luganda in order to reach a broader audience in Uganda and beyond.



A woman cooking. Drawing by Topista Kafuko

NATIONAL ASSOCIATION OF WOMEN ORGANISATIONS IN UGANDA (NAWOU)

NAWOU was formed in 1992 as an organization to bring women together for development and promote collective empowerment. NAWOU is made up of member voluntary organizations that address the interests and concerns of women with an aim of improving their social, political and economic status. NAWOU membership is at three levels –National and Professional NGOs, Community based Organizations that form District Networks in various districts of Uganda, and Associate Members who are individuals who provide services or benefit from NAWOU programs.

NAWOU's vision is to see a unified body of women and women organizations with skills and capacity for self sufficiency. Its mission is to promote the growth of a strong women's movement in Uganda that claims the rights of women and enhances their social and economic status. The core values underpinning NAWOU's work are team work, integrity, visibility, participation and non-discrimination.

To achieve its mission NAWOU undertakes mobilization of members for networking; generates packages or repackages and disseminates information pertinent to members; and builds the capacity of members for advocacy, representation and direct support to members. Some of the benefits to NAWOU membership include an opportunity to learn, grow and practice as a non-governmental and a Civil Society organization; to build confidence, self-esteem and critical thinking; and to acquire knowledge, skills and information on national, regional and international issues that concern human development.

NAWOU's program focal areas for 2007 -2011 are:

1. Gender and Women's Rights
2. Women's participation in Governance
3. Poverty and women economic empowerment
4. Women, Health and Environment
5. Women, Peace and Security

The importance of the peanut project in Kamuli to NAWOU and Uganda

Women in rural areas of Uganda rarely have the opportunity to participate in educational activities and research in particular. Acting on its feminist principles, NAWOU was happy to get ordinary women involved in a study by universities. This demystified the concept of research to ordinary people and made it a relevant part of their everyday life. Women were involved, carrying out their day to day tasks in their local environment, and were asked to share their emotions, beliefs and knowledge on peanuts or groundnuts. The research gave relevance to women's work in the community and in Uganda generally. Cultivation, harvesting and preparing groundnuts are basic common activities, but the project gave these tasks value by recognizing their importance. It enhanced women's sense and capacity for innovation and productivity.

For NAWOU, the project was a promotion of grassroots activism as the majority of our membership works in groups. Encouraging and building confidence among such groups can lead to the survival of culture, traditional norms, fighting food insecurity, improving nutritional status, strengthening livelihoods, building capacity and empowerment.

The men and women that participated in the project, or the beneficiaries, built and improved their technical capacities in various domains, including literacy and writing! The relevance of the exercise books that were given to farmers to record stories cannot be over-emphasized. The writing exercise helped women and men to reflect on their daily experiences and lives to give them an alternative way of doing things and leading better lives. The writing exercise showed women that they need not be shy if they have low levels of education, but that they can improve through practice and Adult Literacy Classes. More especially, they learnt of benefits of educating the female child to lead a better life than theirs.

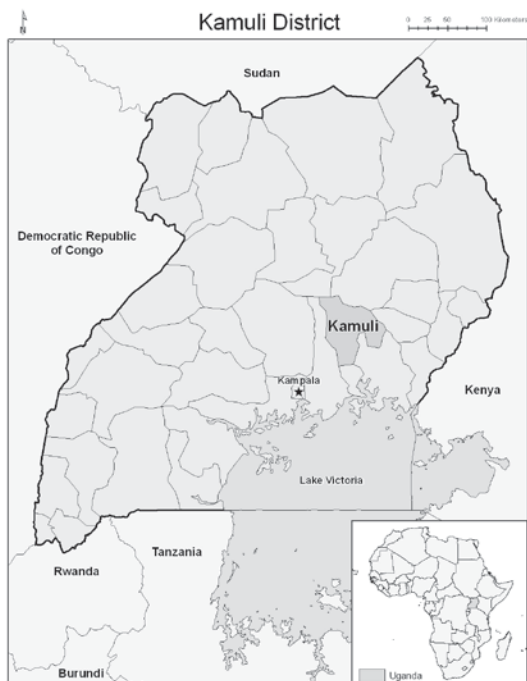
WOMEN EMPOWERMENT

Women empowerment is a concept that has challenged many leaders, academics and local populations. It is a concept that should be applied to all women without regard to the context, environment or the level of communities' one works with. The concept of empowerment guides development actors, and is a goal for many women's organizations. Empowerment encourages the economic, social and/or political strength of individuals and communities through developing confidence in one's own abilities and opportunities. Women empowerment refers to the ability of women to control their own destiny through equal access to resources, opportunities and knowledge, and the right to exercise their individual choices inside and outside of the home.

The project has empowered women to adapt to new and old methods of managing the peanut cycle, to avoid wastage, disease and unhealthy foods. It has long term impact and will lead to economic empowerment which will mitigate and reduce the oppression of women. Improved confidence will provide self esteem and recognition usually denied in patriarchal societies.

KAMULI DISTRICT

Located in Southwestern Uganda, the district of Kamuli is



surrounded by the District of Iganga to the east, Jinja in the south, Kayunga in the west, Soroti in the north across Lake Albert and Pallisa in the north-east. Moderate in temperature, heavy rainfall sustains the thick vegetation of woodlands and savannahs. In 1980 the Kamuli District was formed out of the North Busoga Province which formerly also included present day Bugiri, Iganga, Jinja and Mayuge Districts.

The population, as of 2009, approaches around 800,000 people,

with the bulk living in rural areas. Urban life centers on the administrative headquarters in Kamuli and the large trading center of Kaliro. However, as the majority of the people of Kamuli live in rural sectors, economic activities emphasize food crops such as soya beans, maize, sorghum, cassava, sweet potatoes, finger millet, rice, groundnuts and sunflower; cash crops such as cotton, coffee and sugar cane; and vegetables such as tomatoes, onions and cabbage.

Kamuli district is a multi-ethnic and multi-cultural society, with the predominant ethnic group being the Basoga. Itesot, Banyoro and Bangungu ethnicities are also represented, along with other Ugandan ethnic groups. The language mainly spoken in Kamuli is Lusoga, but some Luganda and English are spoken as well.

GROUNDNUT INFORMATION

Groundnut, also known as peanut, is a crop that grows within one season (annual crop) like beans and maize. Thus, in Uganda, it can be planted twice a year. It belongs to the same family as beans, soybean and peas known as the legume family.

In Uganda, groundnuts are the second most widely grown legume crops after beans. The country produces 165,000 metric tons over a harvested area of 250,000 hectares. The groundnut crop is very popular in the southern, eastern and northern regions of Uganda where it has become part of the people's cultures, as in the case of the Basoga. There are several types of groundnuts grown in Uganda, known as varieties. The most common are Valencia (Red beauty) and Serenut also known as Igola (white in color).

Groundnut is a multipurpose crop. It is a good source of food that builds the body (proteins), food that gives energy to our bodies (fat/oil) and foods that protect our bodies (vitamins and minerals) especially vitamin E, B3, B9, riboflavin, thiamine, niacin and minerals like calcium, phosphorus, magnesium, zinc, iron and potassium. This makes it an essential component of the diet for the majority of both the rural and urban populations in Uganda.

The groundnut kernels are consumed at different stages from immature to ripe either raw or cooked. The kernels in pods can be boiled before drying and eaten; they can be dried, roasted and eaten as nuts (snacks) or can be roasted and pounded or ground into paste or peanut butter used on bread. Above all in Uganda, the kernels can be pounded roasted or raw into powder and the powder made into stew. The stew can be mixed with vegetables, dried fish or smoked beef among others. Groundnuts are also used in confectioneries in many urban centers and products such as peanut butter, paste, groundnut flour; blanched groundnuts are processed in cottage industries for sale on the local market. In many countries, groundnut cake is used as an animal feed. In addition to these, groundnuts as a legume improve soil fertility by adding nitrogen into the soil, one of the most important fertilizers.

Thus groundnut is an appropriate crop for cultivation by resource poor farmers since it can be used both as food and as a source of income.

GENERAL AFLATOXIN INFORMATION

Crops that are dried after harvesting such maize, groundnuts, soybean, millet and sorghum grains can rot if not properly dried. This rotting, sometimes known as decaying, is a result of attack by microorganisms known as molds, which are a type of fungi. Thus, sometimes the process of rotting is known as molding. Molds attack or invade grains so as to have food. As they feed on the grains, they produce waste products which can cause sickness and are toxic to humans and animals. The toxic waste products (toxins) produced by fungi are known as mycotoxins. Because fungi differ in type, even the toxins they produce are different. The most common and widely studied mycotoxins are those produced by one type of fungi known as *Aspergillus flavus*, thus the name aflatoxins.

Aflatoxins and their effect

Aflatoxins are produced by molds/fungi when they invade food and feeds under favorable conditions of moisture, temperature and humidity. Thus, they are produced in poorly dried foodstuffs such as groundnuts, maize, millet, sorghum, soyabean, fish, dried cassava and sweet potato chips as well as animal feeds among others. They are poisonous to both humans and animals once consumed. Depending on the dose consumed, aflatoxins can cause both acute (immediate death) and chronic toxicity (prolonged death) in both humans and animals, especially infants.

Toxic effects of aflatoxins in humans and animals include liver cancer (as a result of prolonged exposure). They bind important nutrients in the body, especially proteins, vitamins and minerals. Thus, aflatoxins are anti-nutritional factors, causing poor growth in children and young animals. In children, aflatoxins have been linked to kwashiorkor due to inability to uptake proteins as a

consequence of liver damage. They reduce the immune system as a result of binding nutrients and thus can have similar effects like those of HIV/AIDS. During the period 2004 – 2005, over 200 people died in Kenya due to consumption of molded maize contaminated with aflatoxins. During the early 1970s, aflatoxins were linked with liver cancer and some deaths in Uganda.

In animals, lowered productivity of milk and eggs, reduced weight gain, as well as vaccination failure are some of the effects associated with aflatoxins. It should be particularly noted that once in the food, aflatoxins are not easy to eliminate because they are not destroyed by ordinary cooking (steaming, boiling or roasting) temperatures.

At the household level, contaminated grains with aflatoxins or those showing mold growth are condemned and thrown away, contributing to food insufficiency. In countries with widespread aflatoxin occurrences, best quality foods are exported and poor quality foods are consumed locally, harming the health of the local population.

At national or global level, food quality and safety is a concern for many people, and international bodies such as the United Nations Food and Agriculture Organization (FAO) and the World Health Organization (WHO), which have created the food standard guidelines. Because they are hazardous to health, aflatoxins are regulated through international markets and are considered non-tariff trade barriers. Regulatory standards prevent exposure of humans and animals to dietary mycotoxins, thus reducing risks of morbidity and mortality that are associated with the consumption of contaminated food. The European Union has recently reduced regulatory limits for aflatoxin to 0 ppb compared to the Food and Drug Administration (FDA) in the United States, which has a standard of 20 ppb. FAO estimates that due to strict regulations, Africa loses over \$750 million annually due to aflatoxin contamination of food.

In our studies in Uganda, we have found that aflatoxin levels range from 0 to 150 ppb. The levels are highest in peanut flour products sold on the market because sometimes processors do not adequately sort the peanuts prior to milling into flour.



THE REPUBLIC OF UGANDA

BE AWARE OF AFLATOXINS



Aflatoxins are poisonous substances produced by moulds in poorly dried food grains such as groundnuts, maize and soybeans that can cause liver cancer and reduce body immunity. If eaten in large doses, this poison may cause immediate death in both humans and animals.



Avoid aflatoxin by:

- Harvesting food grains on time.
- Drying them off ground on tarpaulin or polythene sheets.
- Sorting out damaged seeds.
- Storing them under dry conditions in the granary or storage room where they will not pick up moisture.



Maintain hygienic and sanitary conditions during production, storage and handling of all produce.



THE REPUBLIC OF UGANDA

WEEWALE OBUTWA OBULEETEBWA EMMERE Y'ENSIGO EWUMBYE.



Aflatoxins bwebutwa obuleetebwa obuwumbu mu mmere y'ensigo etakazzidwa bulungi ng'ebinyeebwa, kasooli ne soya era buyinza okukuletera kookolo w'ekibumba n'okukendeeza amaanyi agalwanyisa edwadde mu mubiri. Bw'obulya mu bungi obutwa buno buttirawo mu bantu ne mu bisolo.



WEWALE OBUTWA OBULEETEBWA OBUWUMBU MU MMERE Y'ENSIGO NG'OKOLA BINO WAMANGA:

- Kungula emmere y'ensigo nga tenayitako.
- Ensigo zikaze ng'ozaanika ku kiwempe oba ku kaveera.
- Londamu ensigo ezoononese.
- Zitereke mu kyagi oba awantu wona awakalu wezitaayitiremu mpewo.



Kuuma obuyonjo ng'otegeka, ng'otereka oba ng'okwata ku ky'okulya kyonna.

How do aflatoxins enter into the food/feeds?

- ✿ The mold (*Aspergillus flavus*) can infect crops while in the field and start producing aflatoxins.
- ✿ During harvesting, for example if groundnuts are harvested using hoes and pods are damaged, the molds will enter and produce aflatoxins.
- ✿ During drying, especially on bare ground. Most molds are soil borne, thus will find the chance to enter produce when on bare ground.
- ✿ Failure to dry produce to safe storage moisture content, especially produce harvested during rainy seasons, promotes molding and aflatoxin production.
- ✿ During shelling or threshing by beating produce. This will cause physical damage (injuries) to the grain, creating avenues for molds to enter and produce aflatoxins.
- ✿ During storage in structures that are not moisture resistant (rewetting of produce) and also those that do not hinder pest infestation like insects and rats. This is common in case of granaries and storage of produce on the floor (heaping) by farmers.
- ✿ Since feeds in Uganda are manufactured from ingredients like maize, soy bean, dry fish etc. susceptible to aflatoxin contamination, they can have these toxins if the raw materials are contaminated.

How can we prevent consumption of aflatoxin-contaminated foods?

- ✿ Make sure that grains, cassava/sweet potato chips and all foods that are supposed to be dried, are properly dried to safe storage moisture content. Drying should not be on bare ground. Put a mat or polythene sheet or dry on racks or raised grounds to avoid the produce getting into contact with soil.
- ✿ Store susceptible foods in places that will not allow them to pick moisture (i.e. prevent rewetting of already-dried foodstuffs).
- ✿ Quickly re-dry the produce that is suspected to have picked moisture during storage.

- ✿ Sort the produce to remove rotten/moldy stuff. The sorted-out produce should be discarded and NOT be eaten by humans or given to domestic animals.
- ✿ Maintain hygienic and sanitary conditions during production, processing, storage and handling of all produce.

THE LIFE OF A GROUNDNUT

Harvesting of groundnuts in Kamuli is largely carried out by children and women with a few cases of men being involved. The g. nuts are usually harvested using hoes because of the new improved breed which when grown spreads out, and when well spaced yields a lot per plant. A hoe is used to enable thorough harvesting to avoid leaving groundnuts behind.

The local breed is also grown and the harvesting is done using a hoe or pulling with hands, depending on the weather. In the rainy season they harvest by pulling or uprooting using hands as the ground is soft, and a hoe is used in the dry season when the ground is hard.

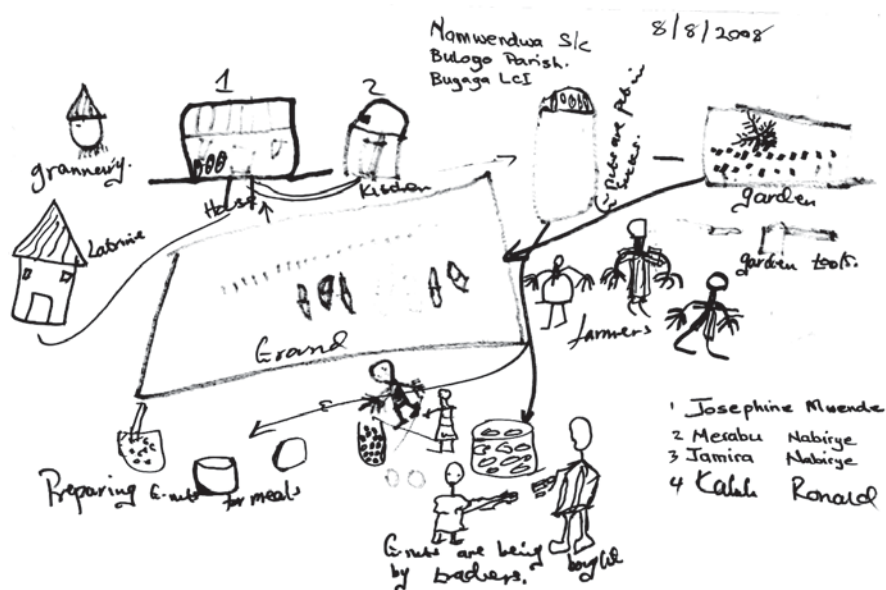
When groundnuts are harvested, they are plucked and carried from the gardens either in baskets or interwoven polypropylene bags, and heaped on the ground in a set room at home. They stay here for one day and thereafter, they are dried under the sun for a period of up to two weeks to ensure that they dry to safe storage moisture content levels.

The groundnuts are dried on the bare ground which has been well swept or on a tarp mat after they are plucked off the plant. The nuts are dried for two to four weeks depending on the weather. The drying area is normally the courtyard at home or in the rainy season in a cleared room. Most times it is the woman who supervises the drying and if it rains on them they are put out in the sun to dry again. You can tell that they are dry by shelling the nuts and testing by chewing a few nuts to be sure.

When the nuts are dry, they are collected in sacks and tied well and kept in safe rooms where they cannot be affected by rodents like rats and other pests. These nuts are not preserved by chemicals at any stage. They are used for consumption partly and the rest kept for seed and for sale in times of financial need. Roughly 40% goes to consumption as sauce and snacks, 20% is saved for seed and 40% for selling. The portion for sale is normally in raw form both shelled and unshelled. From the stories of the people from Kamuli they never sell processed groundnuts.

Shelling is normally done by women with the help of children. The method used for shelling is by hand so there are no costs involved. Sorting is done mostly by women and children to store good seed for planting. The broken and shrivelled g.nuts are put aside to be pounded later in a mortar and pasted for sauce. The rotten and moldy nuts are thrown away because they can make the sauce taste bitter and unpalatable.

The pounding is processing g. nuts into powder form or paste. It is done using a mortar and pestle, mostly wooden; few people have the metallic ones. On market days some take their g.nuts to electric mortars in the market for processing. Since there is usually a supply of g.nuts available, only what is immediately needed for cooking is pounded.



Group participative map

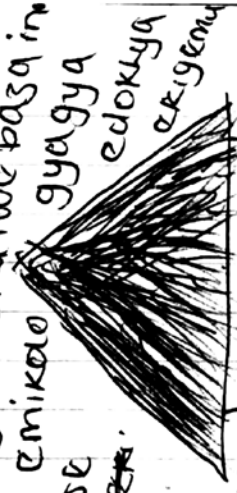
STORIES OF PLANTING, HARVESTING, DRYING & SORTING

"I am Mrs. Esther Walubo. I love to have groundnuts in my home. I planned to plant groundnuts in the first season. I decided to plant on our land in the compound area. I tilled the place and cleared it well and waited for the long rains. I then shelled the groundnuts and sorted the rotten ones out. When the rains came, I started planting the groundnuts in lines and spacing 1 ½ feet line by line and I foot hole to hole.



Wife and husband clearing / slashing garden in preparation for planting groundnuts. Drawing by Esther Walubo

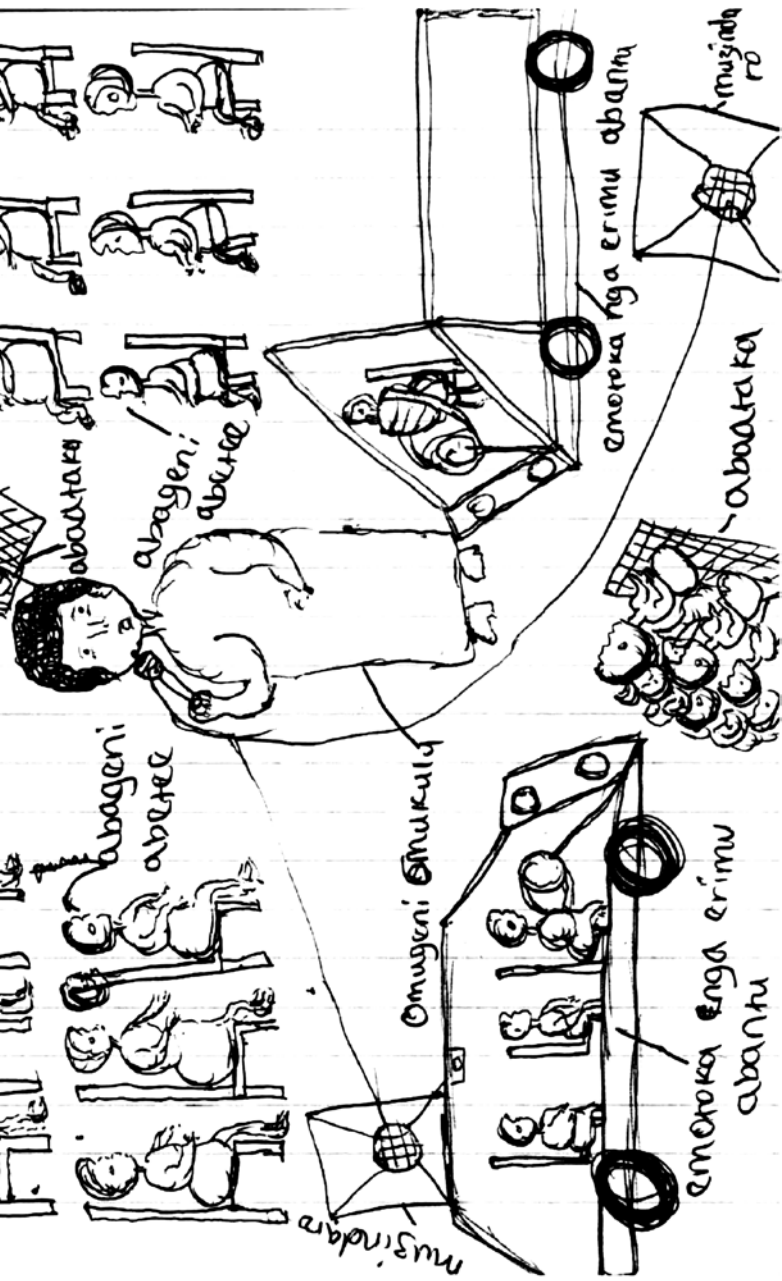
Buti wano toli kumukolo egwembage eyokugaita-
 twali naabageni bangi'ino bwe balinga bakatuka
 twaaba karangira amoido bataga era batwe baza
 bati mukoranga mutyo norundi emikao gyagya
 mumaiso esawa bwedali agaditwe
 twabaiwura ekivuluga era.



nga kilimu
 enkooke eyamu
 lumbi era bayo
 ngera okwwebaza
 ino okw'ingaky

wale webatwe basizanga tubakalang'ina
 ana ido





We are at a wedding function we had a big turnout that day of visitors. When they had settled down we served them with fried groundnuts they were so happy and appreciated and said we keep it up. Later on when it was time for dinner we served the food and groundnuts stew which was thick. We had mixed it with chicken and wrapped it in banana leaves. The visitors ate and said it was more delicious than the fried ones. Drawing by Nankwanga Rose

Then I weeded the groundnuts when they had germinated. This is the first weeding as it needs to be weeded three times before harvest. At the second weeding the groundnuts had grown 1 foot tall and had developed many roots on which the groundnuts soil around each plant. During the third weeding as I collected soil around the plant and realised the groundnut had developed on the roots. I started checking my garden every week at least three times a week.

After three months the leaves changed from green to yellow. This indicated the groundnuts were ready and it was harvest time. This type of groundnuts yield a lot and if you don't use a hoe to harvest you cannot remove all from the ground. I did the harvesting with my children and it took us a few days.

Whatever we brought from the garden we spread it out on turplene to dry throughout; at times we had no sunshine but even when we take them to the house we spread them on the turplene so they dried well. When they had all dried we got six bags. We packed them well and got pallets on which we settled the bags in a store."

Esther Walubo

"We all go as a family to prepare the garden for g.nut growing. We till twice for proper ground in preparation for planting. When the rainy season starts we get the groundnuts where we had been stored them and shell them. We do this in the evening around at 8:00 pm as a family. When we are done the wife sorts the nuts well removing the withered, rotten, broken all that which cannot germinate when planted.

Because of the laborious work involved in planting, I the man do the planting myself. The spacing is two feet between the rows and 1.5 feet from each hole. Each hole must be deep enough to avoid hens from accessing the nuts after planting. I do the digging of the holes and the planting of the nuts simultaneously until I finish the whole garden.

In between the lines I also dig trenches to avoid insects that encroach on the nuts before germinating. I dig trenches of 4 inches deep so the insect tend to follow these trenches and in

a way it saves the nuts from being encroached on. It also helps prevent the hens from scooping in the holes to access the nuts. Not only that but also when the rains fall it controls erosions of the garden. Though this activity is laborious it helps the groundnuts to make new yields.

When the groundnuts germinate and some weeds grow in the garden, I go together with my wife and weed the nuts for the first round. When the weeds grow again we weed the second time ensuring each plant has enough soil around it to enable it yield more pods. We ensure the garden is always clear of weeds to avoid rats from encroaching on the nuts as they grow. So the weeding is done two to three times before harvesting.



Child(ren) chase off chicken from the drying groundnuts. Drawing by Namuwaya Ednansi

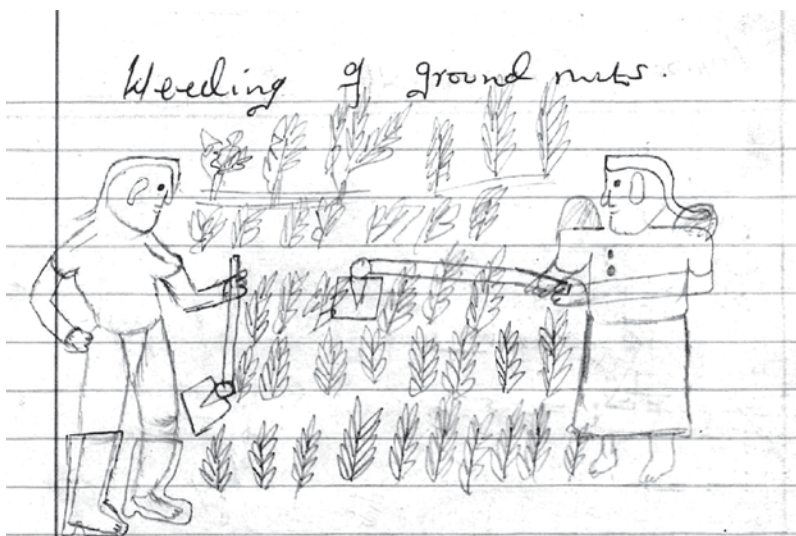
When the groundnuts are ready the leaves of tree plant turn yellowish, brown and wither. And because the improved nuts yield a lot we use a hoe to uproot them with care. The uprooting is done by me the man, then my wife and the children do the plucking off of the nuts from the plant. We harvest for two to three days depending on the size of the garden and every day we ferry the uprooted nuts home for drying.

We clear the courtyard and spread them to dry. We collect them every evening and keep them in the store and bring them out to dry every morning. We do this for two weeks until the

groundnuts dry. When the nuts are dry, we pack them in the sacks and improvise pallets on which we rest the sacks in the store.

We use part of it for domestic purpose as we look around for market for the rest and also save some for seeds to be planted in the next season. We don't use any preservative when we store them. I normally plant once in a year."

Mukaaya David



Drawing by Jane Magala

"We prepare for groundnuts growing by cleaning the land for the gardening. Then we till the land using hoes and leave it to rest for three weeks. Then again we re-till it cleaning off any weeds as we wait for the rains. When the rains start we start planting the groundnuts. The groundnuts are planted in lines using a string. This we do to get better yields.

The groundnuts are weeded immediately when weeds are seen for the first time. The second weeding is done when the groundnuts begin to flower. During this time as we weed we gather enough soil around the plant to enable them to make more yield.

When they mature after three months we harvest them depending on the weather. When it is rainy season we uproot using hands but during the sunny season we use a hoe because the ground is hard.

We load the groundnut back home and spread it in the sun to dry. We spread it on the court yard and remove it in the evenings collecting in the baskets. Meanwhile we also eat some while it is still raw. We boil it in the shell form and eat it with tea as a family. We dry it for two weeks and pack it in sacks and keep it in the store.”

Bakobye Prossy

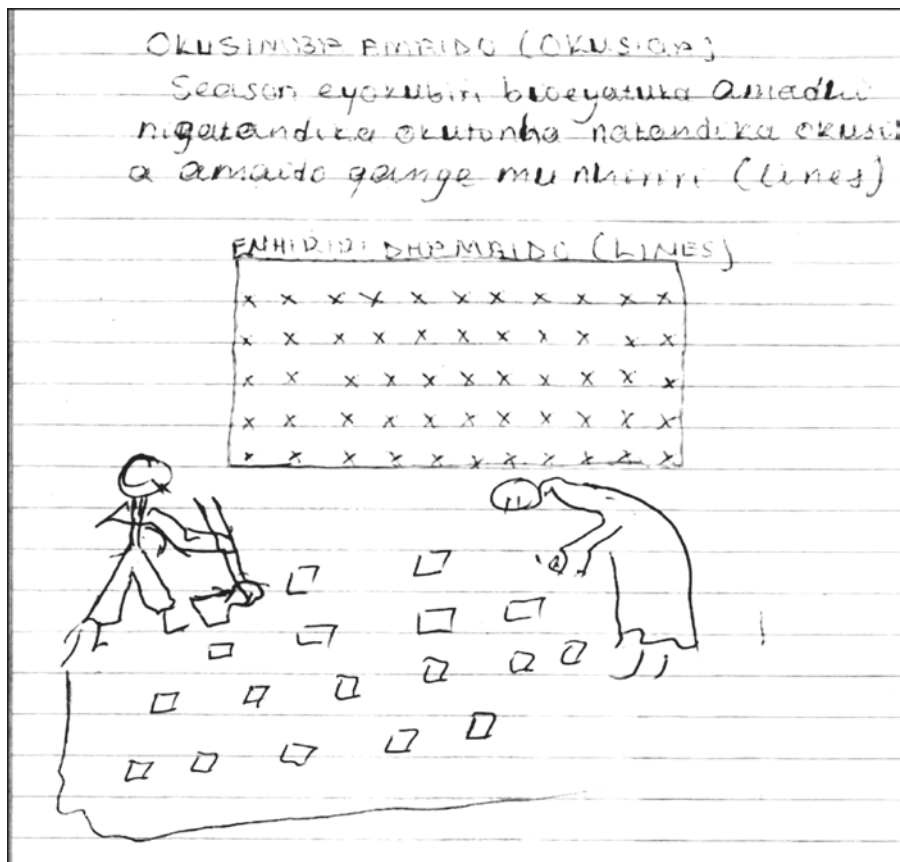
“I planned to grow groundnuts in the second season and I decided to grow it in the hilly part of my land because it was very fertile. I cleared the area because it was bushy and I made it clear and set ready for groundnut growing and I waited for the rains.

I shelled the groundnuts for planting and sorted out the rotten, broken and shrivelled nuts which cannot germinate and the sorted groundnuts I kept them in a sack as I waited for the planting period. When the second season began and the rains started falling I started planting the groundnuts in lines.

The weeding of groundnuts needs to be made at least three times before harvest. I weeded my groundnuts the first time when they had just germinated. During the second weeding the groundnuts will have grown more and the roots are well spread so you need to weed and gather more soil around the plant. And weeding the third time the groundnuts will have developed on the roots and this encourages me and I begin checking on them every two days until harvest time.

When the groundnut matures, the leaves of the plant turn yellowish.”

Yosefina Waiswa



When the planting season came, I prepared to plant my groundnuts seeds in lines. Drawing by Yosefina Waiswa

BE AWARE OF AFLATOXINS

Rotten or moulded food grains such as groundnuts, maize, beans plus cassava chips contain poisonous toxins known as aflatoxins that are dangerous to your health. Aflatoxins may cause diseases and conditions such as liver cancer, retarded child growth and immune suppression.



Prevent aflatoxin related diseases by:

- Properly drying food grains and other produce, off the ground.
- Thoroughly sorting out moulded and rotten grains.

Maintain hygiene and sanitary conditions during production, storage and handling of all produce.

WEEWALE OBUTWA OBULEETEBWA EMMERE Y'ENSIGO EWUMBYE.

Ensigo eziwumbye oba ezivunze
ng'ebinyeebwa, kasooli, ebijanjaalo,
muwogo omusalesale birimu obutwa
obuyitibwa aflatoxins era bwabulabe
eri obulamu bwo. Obutwa buno
buyinza okukuletera endwadde oba
embeera nga kookolo w'ekibumba,
okukonziba mu baana,
n'okukendeeza amaanyi agalwanyisa
eddwadde mu mubiri.



THE REPUBLIC OF UGANDA

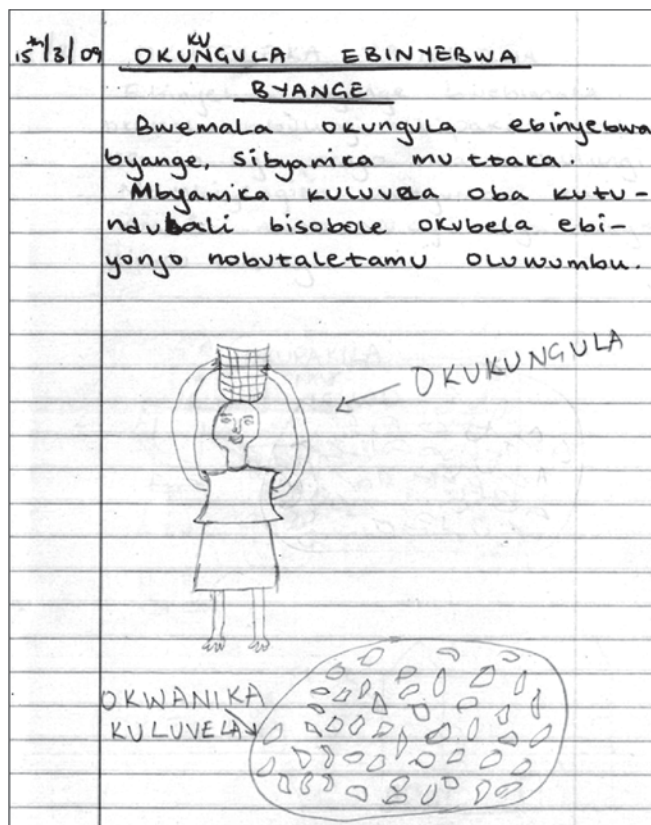


WEWALE OBUTWA OBULETEBWA OBUWUMBU NG'OKOLA BINO WAMANGA:

- Ensigo n'emmere bikaze bulungi
era tobyanika ku ttaka.
- Londamu ensigo eziwumbye
n'ezivunze.



**Kuuma obuyonjo ng'otegeka,
ng'otereka oba ng'okwata ku
ky'okulya kyonna.**



When I harvest my groundnuts I don't spread them on a bare ground. I get a big polythene paper or a tarpaulin so I spread on; that way they will remain clean and also avoid molding. Drawing by Mwase Samuel

"I planned to grow groundnuts on my land with clay soil because I expected to get a big yield. I cleared the land of the bush and gathered all the weeds; I tilled the place well to set it for planting. I shelled the groundnuts and stored them well ready for planting. Then I dug the holes in lines with a spacing of 1.5 feet between lines and 1 foot between the holes in a line. Then I planted the groundnuts in the holes and covered with just enough soil.

I weeded the groundnuts three times, the first weeding, I removed the weeds from the garden, the second weeding I

removed the weeds and gathered enough soil on every plant to support the plants. The third time I weeded adding more soil on the plant for good yields.

To harvest one can use hands to uproot or a hoe. I used a hoe to harvest and I knew they were ready because the leaves had turned yellowish. I carried them in a basket and took them home for drying in the court yard. I spread them four times and when they had dried I poured them in a bare room on the floor so that they don't mold."

Sooka James

"We start preparing for groundnut growing in the month of January. We start by clearing the area where the groundnuts will be planted. When we finish clearing we use the hoe to till the garden or at times we hire the ox-plough. When we till we wait for three weeks and re-till the garden in February as we wait for the rains so as to plant the g.nuts.

The rains come towards the end of February or early March and immediately we plant the g.nuts.

We have two types of g.nuts; Sere nuts and Spine nuts. Sere nuts are planted in lines with spacing of 2 ft of 1ft or 18 inches by 6 that is if the garden is very fertile. Spine nuts are planted in lines with a spacing of 12 inches by 6 inches. When the nuts germinate the first weeding is done immediately. The second weeding is done when the nuts flower and at this weeding more soil is collected around the plants for good yields. Sere nuts take 105-120 days to mature while spine nuts take 90 days to mature. When harvest time is during rainy season we uproot them using hands and in the dry season we use hoes. Harvesting of the nuts is done and the nuts are plucked off the plant and collected in polythene bags and baskets. They are then carried and taken home and spread in the courtyard to dry."

Mwase Samuel



The nuts are dried for two weeks and they are then collected in sacks, baskets, cut jerry can or cleared rooms for storage. We also use some for sauce by pounding in a mortar with a pestle. We use the paste as source for food. We also fry some nuts to eat as snacks with tea. We also sell some for income to meet our daily needs. Drawing by Naikoba Esther

“My names are Namuwaya Ednansi, I was born in Bugaya in 1978. On 15th March 2008 I planted my g.nuts. On 2nd April 2008 I weeded the g.nuts. On 20th July 2008 I harvested the g.nuts after four months. I plucked them off the plant and collected them in a sack and took them home. I then spread them on the ground to dry.”

Namuwaya Ednansi

STORIES OF THE USES OF GROUNDNUTS

Groundnuts are eaten several times a week and prepared in many different ways. They are cooked as sauce or stew, or mixed with other sauces. They are shelled, roasted and eaten with tea.

12/6/2008
 Kwari humu nga rusa amanda gungu,
 ngasexavira mukino bulungidelala.
 Kafumba green pepper era menyanya
 nga ngasemo nekabbage. Hamecamu
 Kamurari mutanetano era no mungu
 nayo nga Simungu. Byaya Bulungu era
 nembirabura babura mendera ya munda
 awo ni neta werera obandula owo ya ne
 ne baata wobaana kubanga kwooso
 obaana kababawo nga bari kusimera.
 twawomera myo nyini.

One day I shelled the groundnuts and pounded them in a mortar till they were very fine. I prepared a paste and boiled. I then prepared green pepper with tomatoes together with cabbage and added red pepper and salt. I then mixed them with groundnut sauce and boiled together till they were ready. We settled down to eat I and my husband because that day, the children had gone to school and we enjoyed it because it was so delicious.

Notes by Kateme Betty

"We shell some and fry/roast to eat with tea. We roast, pound in a mortar and use the paste as sauce by mixing with water and boiling. We get greens—'doodo'— and mix with the paste and cook. It makes a delicious sauce. We at times boil matooke and get groundnuts paste, dissolve it in water and add to the boiling matooke. It is so delicious when it gets ready. At times we buy smoked fish, boil it for some time then add groundnut paste. It also makes good sauce."

Bakobye Prossy



On evening tea fried ground nuts is a must. Drawing by Esther Walubo

"As a snack with, we shell and fry them in a sauce pan with a little water and salt. We make sauce by boiling and adding tomatoes, onions and spices. We mix the paste in boiling foods like matooke and Irish potatoes. We mix the paste with greens or cabbage and boil together. It makes a delicious sauce."


Mukaaya David

"If there are leftovers of processed but uncooked paste it is stored in a clean plastic container with a lid and for cooked paste it is covered and well kept in the sauce pan it was prepared in, in the cupboard, just one day maybe until the next meal. "

Sooka James

"The groundnuts are a delicious sauce and its very useful in one's life, it also improves one's skin and we this way believe you cannot send a child to a journey without packing some groundnuts for them. It can also be mixed in any sauce prepared in our homes, in sauces like cabbage, green vegetables, smoked fish, chopped cassava, matooke, etc."

Kwabye Alice

20/8/008
 Olulwa Lweneitegerei amaielo bwega-
 woma. Nasoka ragerikalanga nanwera
 kukyanyi. omuxima yowamerwa
 Amaielo. nabaiinga bawamerwa
 amaielo amakalange age nonzemu
 amavundu.

 Nirino eride eriwoma

On the 20th August 2008 I discovered how sweet groundnuts are. I first fried my shelled groundnuts and ate them with tea together with my family. My husband enjoyed and the children enjoyed because I had sorted the rotten ones and thrown them away before frying them. Drawing by Lovisa Mutabiro

"When we sell off some groundnuts it brings income which we use in meeting school fees for our children."

Margaret Ziraba

RECIPES

30/4/2009

napumba amatooke ne
tekamu amaicho gali
mela era napumbira mu
ganda wange erayusima

~~era~~ era yambuka egeli
gyezumbe ematooke.



I cooked matooke and added groundnut paste made from the white type of groundnuts; I cooked for my sister who had come to visit me and she was so grateful and asked how I had prepared the meal. Drawing by Namwebya Betty

“On 15th September 2008 I shelled the g.nuts, sorted them and pounded them in a mortar. Then I poured it in a saucepan, added water and sliced cabbage and cooked them together. When the sauce was ready I served it with posho and we enjoyed it as a family.

On 17th September 2008 G. nut stew. I prepared g.nut sauce mixed with green vegetables and then the sauce was ready, I served it with cassava and the meal was delicious.

On 1st October 2008 I prepared beans when they were ready sometimes. I served this sauce with rice and we as a family enjoyed this meal.

On 11th October 2008 I got a visitor and I prepared for the visitor a meal for matooke and g.nuts cooked together. The visitor really enjoyed the meal.

On 14th November 2008 I ground my shelled g.nuts, peeled the cassava and chopped it then I prepared the cassava together with the g.nut paste and I served it to my family and we enjoyed it."

Josephine Mwende

"As sauce g.nuts are prepared in different ways.

1. We prepare greens [doodo] and add g.nut paste and it tastes delicious.
2. We also prepare the g.nut paste and add it to matooke and cook it together and it is a nice meal.
3. We also prepare g.nut paste boil it a bit add spices and onions and put it in a container and cover it over food. This food is called 'kimotte'.

At times we buy smoked fish boil it for a while and add g.nut paste. It is a delicious sauce too.

When shelling the groundnuts to pound them for sauce, we should ensure that they are properly sorted with no rotten ones as they can make the sauce bitter."

Mwase Samuel

"One day I shelled my groundnuts and pounded them in a mortar. I then prepared green pepper, cabbage and tomatoes, I added onions and salt and boiled them with the groundnuts for 40 minutes and they were ready. Food was ready so I served and we enjoyed it with my husband because my children were at school that time.

Another day it was interesting because I had visitors. It was my sister and her husband. As usual I prepared the groundnut paste with mushrooms and boiled it for forty minutes. And when it was ready we had it with potatoes. And it was delicious."

Kateme Betty

G.nut stew

"I shelled my g.nuts 1.5kg and sorted it; pound it in a mortar with a pestle. That was after I had roasted them. When it was fire I got a saucepan poured it in. I added $\frac{3}{4}$ of water to the paste, stirred it well and put it on fire to boil for 30 minutes. When it was ready I put it down and added salt. I served the visitors and my family we enjoyed it with potatoes.

G.nuts and greens (pumpkin leaves)

I shell my g.nuts pound them until they are fine. I get pumpkin leaves from the garden, cut them into small portions, washed them, put them in the cooking pot boil them for an hour, then I add my pounded g.nuts and continue boiling for another 30 minutes. When it's ready I add salt and serve it with rice or matooke. It's delicious.

G.nuts and smoked fish

I buy smoked fish from the market in Namwenda; break it into small pieces wash it thoroughly and boil it for about 40 minutes. I then add g.nuts paste dissolve it well in the fish and boil for another 30 minutes and when its ready I add salt and serve it with matooke but it can be served with almost all foods.

G.nuts and mushrooms

I went to my sister's home and found she had kept for me dried mushrooms. When I got back to my home I soaked the mushrooms for five minutes then washed them clean and added water and boiled them for 15 minutes then added g.nuts paste and boiled for another 30 minutes. When it was ready I served this with cassava."

Kafuko Margaret

KANO TIALA EME AMATOUKE NE
 GAVUZUGA NETUUMELIANYU
 ELATWALI BASANYUFUNYU
 FENAMUMAKA KUBUNUKU O
 LIKOKUSATU NGA 27 / 05 / 2009

We ate matooke with groundnuts stew and enjoyed it so much and we were very happy the whole family. It was on 27th May 2009. Drawing by Kawuma Edisa

"On 20th August 2008, I shelled my groundnuts roasted them then pounded them in a mortar till they were fine. I prepared green pepper mixed it in the groundnut paste and cooked them for some time. I enjoyed it with my family.

On 13th October 2008 after we had been trained by NAWOU I prepared my groundnuts sauce. I first shelled the groundnuts, sorted out the rotten ones and then pounded the good ones and mixed with water to cook. I fried with little oil the tomatoes and cabbage and mixed them. I boiled for some time when it was ready as I was serving I got two more visitors and served them too and we all enjoyed. The visitors asked me how I had prepared the sauce.

On 17th October 2008 I got a visitor, I shelled the groundnuts and pounded them properly then got smoked fish and broke it into small pieces mixed in the groundnut paste and boiled it together. When it was ready I served it with matooke. The visitors really enjoyed the meal.

On 5th November 2008 I prepared groundnut sauce and mixed it with bitter tomatoes. When they were ready I served them with sweet potatoes to my family and we all enjoyed."

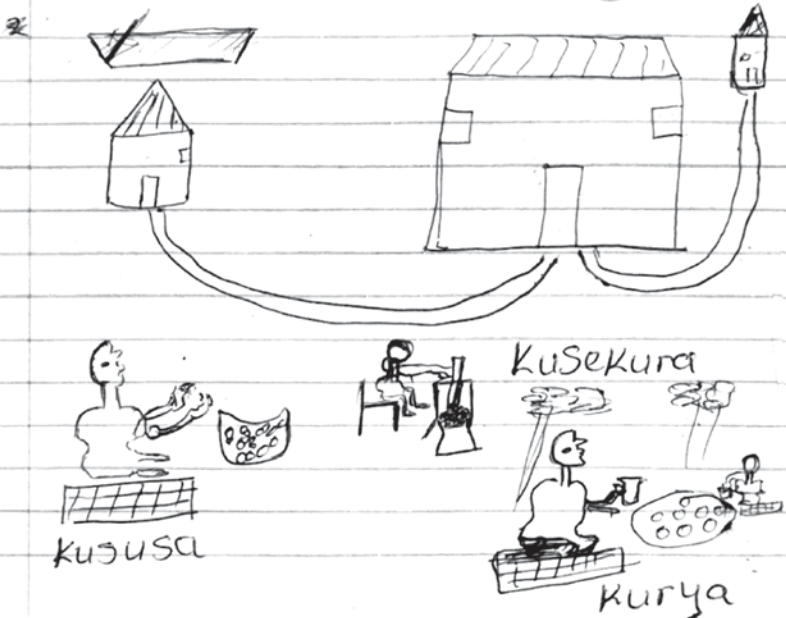
Nabirye Merab

OBA OLUSI TUGULA EBYEMUYANJA EBINALU
NETWEEKAMU EBIMYERWA NUGA BIKALANGIDWANE
ERA NUGA BISEKULIDWA BULUMU

22/3/2009

AMU OKUFUMBA AMAIDHO

I natara amaidho nasusa nasekura na
~~sekura~~ burungi natumba cabbage nata
bikamu amaidho nawomerya INO.



Sometimes we buy smoked fish and break it into pieces, boil it with roasted and well pounded groundnut to make sauce.

March 22nd 2009; BOILING GROUNDNUT. I got groundnuts, I pounded them, I boiled cabbage and mixed with pounded ground nuts, boiled together and enjoyed so well. Drawing by Bakoby Prossy

G.nuts and cabbage/bitter tomatoes/dried fish

“On 11th September 2008, I shelled my g.nuts sorted them well then put the good ones in a mortar and pounded. I added bitter tomatoes in the g.nut paste in a saucepan and boiled the g.nut paste in a saucepan and boiled them when we served it on the food we enjoyed it as a family.

On 1ST October 208 I shelled my g.nuts pounded them in a mortar then I poured it in a sauce pan and mixed with little water and I added mushrooms then boiled them until they were ready. I had prepared matooke for food. I served them and we had a delicious meal.

On 6th October 2008 I shelled my g.nuts, sorted out the rotten ones and I roasted them in a sauce pan. When they were ready I served with tea. We all enjoyed.

On 8th October 2008 I pounded g.nuts then put them in a saucepan, added onions and boiled for some time and when it was ready I served it with potatoes. It was a delicious meal.

On 11th October 2008 I roasted my shelled g.nuts, then pounded them and poured them in a saucepan, added some water, sliced bitter tomatoes mixed and boiled for some time. When it was ready I served it with potatoes and we enjoyed our meal.”

Josefine Mwende

G.nuts and green pepper with curry

“I get shelled groundnuts pound them until they are fine. I get a saucepan and put the groundnut paste. I add sliced onions or green pepper. I put just adequate water not much, then curry powder with a little salt. Cover my mixture well and place on top of a packed saucepan of food and put it on fire so as the food cooks the sauce is prepared by steaming and when the food gets ready the sauce will also be ready.

I pound well my shelled groundnuts and first wash the greens that I am to mix in the paste. I first boil the greens until they get ready then I add the groundnut paste and stir it well to mix. I boil

them together and add curry and salt for at least 40 minutes and my sauce will be ready to be served.

I also shell groundnuts, roast them and when they are ready I roll them on a tray to peel off the outer cover and then pound until it is fine and oily. I get a clean container with a cover and store it as groundnut butter. I use it as butter on bread or at times if I have food left over the previous night I use this groundnut butter and enjoy it with tea. My children also like it very much. We call it *wudi*."

Kwabye Alice

"On 28th August 2008 I prepared g.nut sauce. I first fried the tomatoes then added the g.nut paste and the green vegetables (doodo).

On 3rd September 2008 I prepared g.nuts sauce mixed with mushrooms.

On 9th September 2008 I prepared g.nut sauce added fried tomatoes and served it with matooke.

On 10th September 2008 I prepared g.nut sauce, I mixed it with a smoked fish broken into smaller pieces and served it with millet bread and the family enjoyed."

Namuwaya Ednansi

LESSONS LEARNED

“On 25th August 2008 I and my husband visited our friends at Irapa. They roasted groundnuts for us and served us with tea. When we tested the groundnuts they were sour. I discovered that they had stored them poorly and they had molded. We had learnt from NAWOU that extra care has to be taken when storing groundnuts after drying.”

Nabirye Merab

“I realized a big difference in the home processed g.nut paste compared to the pounded groundnuts we buy from the shops as they at times add maize flour or pound indiscriminately with the rotten nuts too.

According to the training we got from NAWOU I realized we were losing our lives to improper preparations of g.nut paste we use for sauce.”

Mutabiro Viriano

“I would like to thank the secretariat especially the Secretary General for giving me a chance to go to Kamuli. Women in the project are knowledgeable about eating clean groundnuts after being trained by Dr. Kaaya, which training I also attended. When we went to collect the books women had written a lot of stories and even those who do not know how to write were being helped by their husbands who also attended the training.

Women have good knowledge right from planting, drying, preparing groundnuts sauce (putting in mushrooms, eggplants, cabbages etc.). They no longer experience rotten groundnuts as in the past before getting knowledge which is in addition to knowledge from their grandparents. They practice; this knowledge has helped them in their everyday life.”

**Lovisa Kabuula, Chairperson/ NEC Member Representative
Eastern Region**

23/01/2009

Emigaso gya Maich
 Tugatunda ne tufunamu
 ensimbi zokukozesa Mumaka



atwala kutunda

The importance of groundnuts: We sell them and get money to meet our needs in a home. Here, they are being taken to the market for sale. Drawing by Scovia Mwase





Women and men farmers from the Namwendwa Sub-County in the Kamuli District of Uganda have long depended on the groundnut (peanut) as a vital source of food and livelihood. It is central to their culture. This book raises awareness of the problems caused by aflatoxins in groundnut and other crops and suggests appropriate post-harvest practices to reduce their impact on health and nutrition. Farmers were asked to trace the path of the groundnut from field to plate. Here they describe their groundnut practices both before and after harvest. In addition to the personal farmer accounts, maps, and drawings, the book includes recipes, providing a rich appreciation of the importance of groundnut in everyday life in this region of the country.