# REPORT ON ARTISAN TRAINING FOR AGRO-PROCESSORS AND FABRICATORS IN FOOD SAFETY AND BASIC MACHINE MAINTENANCE

**By**

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**December, 2015**

## SUMMARY

As part of the project "*Strengthening Innovations and Technology Dissemination for Sustainable Development in Cereals, Cocoa and Coffee Value Chains in Western and Eastern Africa*" (SATTIFS) in Ghana, an artisan training was organized for twenty (20) participants made up of Agro-processors and machine fabricators. They were taken through food safety and basic machine maintenance. The residential training took place at the Gratis Foundation premises in Sunyani from Tuesday 1st December to Thursday 3rd December 2015. The training program was facilitated by Mr. Peter Mensah (Head of Gratis Foundation, Sunyani), Joseph Mensah (Technician), Ameli Atti (Senior Supervisor), Sule Seidu, Laryea Ahmed and Thomas Clottey all workshop Technicians. The emphasis of the training was on machine maintenance and suitable engineering materials for food processing equipments to avoid rusting that leads to food poisoning during food processing. The participants had a hands-on production of a pull cart for collecting farm produce to reduce labour. The participants also visited a gari processing plant at Duayaw Nkwanta where cassava is processed into gari. At the end of the training participants were very happy and found the training very informative and useful. They, however, expressed concern about the high cost of the food processing machines.


## 1.0 Introduction

The "*Strengthening Innovations and Technology Dissemination for Sustainable Development in Cereals, Cocoa and Coffee Value Chains in Western and Eastern Africa*" is a project aimed at building capacity in science, technology, and innovation in West and East Africa to boost food security, reduce/alleviate poverty and enhance socio-economic development. It is being implemented in several communities in the Brong Ahafo and Ashanti Regions of Ghana.

This report is on the training of (20) artisans made up of food processors and machine fabricators in the project catchment areas, namely; Akrodie, Wenchi, and Sunyani. The training was organized to expose participants to existing technologies available in the appropriate use of metals in fabricating food processing machines and the proper maintenance schedules for them. It also exposed the participants to sharing of experiences and how they could help in the dissemination of the technologies to other fabricators and food processors. Through the training workshop, a learning platform was created for participants to interact with each other and also network with Gratis Foundation for all their machine repairs and fabrication.

## 2.0 Methodology and Results

The training sessions took place at the Gratis Foundation workshop premise, Sunyani from 1st December-3rd December, 2015. The time table and list of participants are indicated in Tables 1 & 2. The training involved theory, hands-on practical session (figure 1), and a field visit.

The training schedules were followed and the cooperation and enthusiasm of participants were lauded by the training staff of Gratis Foundation.

**Table 1: Time Table for the artisan Training**

| DAY 1<br>1st Dec.'15 | ACTIVITY | TIME | RESOURCE PERSON |
|---|---|---|---|
| | Registration of participants, Welcome of participants, Self Introduction and Course expectation | 0800hrs-1000hrs | Prof. Obeng-Ofori (Project Coordinator, SATTIFS)/Peter Adasi (Head of Gratis Foundation, Sunyani) |
| | Introduction of Engineering Materials, the effect and difference between these materials | 1000hrs-1100hrs | Peter Adasi/J. K. Mensah |
| | Introduction of food processing equipment that Gratis produces for clients | 1100-1200hrs | Peter Adasi |
| | **Break** | **1200hrs-1300hrs** | |
| | Introduction of farming equipment that Gratis produces | 1300hrs-1400hrs | Peter Adasi |
| | Basic machine maintenance of equipment | 1400hrs-1530hrs | Peter Adasi |
| | Safety and house cleaning of food processing | 1530hrs-1700hrs | Peter Adasi/J. K. Mensah |
| **DAY 2**<br>**2nd Dec.'15** | Workshop Practice (Manufacture of Garbage push truck) | | |
| | Bench fittings marking out of part | 0800-1000 | J. K. Mensah/Sule Seidu |
| | Cutting list of part | 1000-1100 | Layea Ahmed |
| | Tacking and framing | 1100-1200 | Thomas Clottey/ Layea Ahmed |
| | **Break** | **1200-1300** | |
| | Full Welding | 1300-1430 | J. K. Mensah/Layea Ahmed/ Sule Seidu |
| | Assembling/painting | 1430-1600 | Layea Ahmed/ J. K. Mensah/Thomas Clottey |
| | Testing and Acceptance | 1600-1700 | Thomas Clottey/J. K. Mensah |
| **DAY 3**<br>**3rd Dec.'15** | Field Trip to Cassava Dryer and Gari Processing in Duayaw Nkwanta | 0800hrs-1500hrs | Peter Adasi/J.K. Mensah |
| | Closing Ceremony | 1500hrs | Prof. Obeng-Ofori |

**Table 2: List of Participants**

| Name | District/Community | Telephone Number |
|---|---|---|
| Gyeke Kwame Eugene | **Sunyani** | **0244583060** |
| Issahak Chekora | **Sunyani** | **0240355140** |
| Solomon N. A. Masopah | **Sunyani** | **0207703281** |
| Antwi-Brefo Boateng Emmanuel | **Sunyani** | **0267099903** |
| Sarfo Agyeman | **Sunyani** | **0505929396** |
| Amankwa Isaac | **Sunyani** | **0506548225** |
| Mohammed Nimo | **Goaso/Akrodie** | **0545148007** |
| Agyei Manu | **Goaso Akrodie** | **0208569889** |
| Fati Adam | **Goaso/Akrodie** | **0242014761** |
| Elizabeth Appiah | **Goaso/Akrodie** | **0240067141** |
| Rose Manu | **Goaso/Akrodie** | **05000093547** |
| Peter Baah Acheamfour | **Goaso/Akrodie** | **0544553763** |
| Issah Fadilatu | **Sunyani** | **0509604749** |
| Kojo Afriyie | **Sunyani** | **0205345607** |
| Issah Mobarik | **Sunyani** | **0505674846** |
| Joseph Kwao | **Wenchi** | **0570222614** |
| Yaw Kumah | **Wenchi** | **0209127079** |
| Victor Asamoah | **Wenchi** | **0505103910** |
| Donkor Nketiah Thomas | **Wenchi** | **0247551793** |
| Martin Agbodzie | **Wenchi** | **0247504464** |
| **FACILTATORS** | | |
| Peter Adasi | **Gratis Foundation** | **0244720793** |
| Joseph K. Mensah | **Gratis Foundation** | **0275321820** |
| Ameli Atti | **Gratis Foundation** | **0244769613** |
| Sule Seidu | **Gratis Foundation** | **024344034** |
| Laryea Ahmed | **Gratis Foundation** | **0549251623** |
| Thomas Clottey | **Gratis Foundation** | **0246351354** |

**Figure 1: Participants in the Gratis Foundation Workshop during the training**

The training was facilitated by Mr. Peter Mensah (Head of Gratis Foundation, Sunyani), Joseph Mensah (Technician), Ameli Atti (Senior Supervisor), Sule Seidu, Laryea Ahmed and Thomas Clottey all workshop Technicians. The emphasis of the training was on machine maintenance and

suitable engineering materials for food processing equipments to avoid rusting that leads to food poisoning during food processing. Food processing machines for processing maize, cassava and palm oil were discussed and the participants had hands-on fabrication on a farm pull cart (figures 2 and 3).

**Figure 2: Farm Pull cart under various stages of fabrication by participants**

**Figure 3: Completed Farm pull cart on display by participants**

**4.0 Field Visit**

Participants also paid a visit to Duayaw Nkwanta Prison rehabilitation center (figure 4), where they have an established cassava and oil palm processing machines for production of palm oil and gari by the prison inmates. These equipment were fabricated by Gratis Foundation and they had an insight into their operations, maintenance and part replacement schedules.

a.  b.  c. 

**Figure 4: Cassava processing plant a. Grater b. Presser c. Gari roasting set up at Duayaw Nkwanta Prison Camp**

**Certificates**
The participants were given certificates for their participation in the training sessions (figure 5).

**Figure 5: Participants collecting their certificates from Prof. Obeng-Ofori, the Operational Unit Coordinator.**

**3.0 Conclusion**
The training was very successful and the pull cart was donated to the Estate Department of the University of Energy and Natural Resources to be used to facilitate collection of refuse on the campus.

**Annexes**

# THREE (3) DAYS TRAINING PROGRAMME FOR AGRO-PROCESSORS & FABRICATORS IN FOOD SAFETY & BASIC MACHINE MAINTENANCE.

## BY GRATIS FOUNDATION, B.A.R & SPONSORED BY UENR, SUNYANI.

## ENGINEERING MATERIALS

1.0 Engineering materials are mostly metals used in the construction industries all over the world.
These metals are of two (2) forms;

- Ferrous- Metals.
- Non-Ferrous Metals.

1.1 **The Ferrous Metals:** contain iron ($Fe_3$+), they are hard materials. Examples are; Mild Steel, Medium Carbon Steel, Stainless Steel and Cast Iron.
**USES:** In the Heavy Construction Industries, for manufacture of industrial machines, and equipment, Agro-processing machines, Heavy-duty road construction equipment, Road works, etc.

1.2**The Non- Ferrous Metals:** Do not contain iron ($Fe_3$+). They are soft materials. Examples are; Copper, Zinc, Aluminum, Brass, Bronze and Gold.
**USES:** In the Light Construction Industries for manufacture of; Jewels, Roofing sheets, Pumps, Taps and Bushings. Most especially in the water construction industries, just to mention a few.

**NB**: Out of all these metals, the stainless steel is highly commended for construction of food processing equipment. The reason being that,it is rust free and does not corrode. It has no Toxic effect on food processed.
However,Mild Steel Materials corrode, rust and are toxic when they come into direct contact with food processed.

## 2.0 FOOD PROCESSSING EQUIPMENT PRODUCED BY GRATIS FOUNDATION.

These are grouped into these forms;

### 2.1 Cereals/Grains for Post Harvest Losses.

a) Maize Threshers
b) Groundnut Decorticators
c) Dryers

2.2 **Cassava Processing.**

a) Cassava Graters
b) Presses
c) Roasting pans

2.3 **Palm Oil Processing.**

a) Boiling Tanks
b) Pail oil Expellers
c) Palm Fruit Strippers
d) Oil Storage Tanks

## 3.0 FARMING EQUIPMENT PRODUCED BY GRATIS FOUNDATION.

These include; Bullock-Plough, Bullock Cart, Donkey Cart, Ridgers, Farm Cart. It is gratifying to note that, all these equipments are produced at our branches up North for farmers there.

## 3.1 BASIC MACHINE MAINTENANCE OF EQUIPMENT.

It is highly commended that all food processing equipment, pans and kettles should be kept clean and well dry at all times to drive away fungus and insects which may be poisonous to the food that we process.

## 3.2 MAINTENANCE OF EQUIPMENT.

a) Daily Cleaning, weekly and monthly routine works are recommended.
b) Tighten all loose bolts and nuts before starting the equipment in the mornings.
c) Listen to strange noise immediately you start the machine and check to correct the fault before continuing the daily work.
d) Change belt or tension them when loose.
e) Weld where leakage occurs and repaint equipment after welding.
f) Ensure daily, weekly and monthly greasing of machines where nipples are located to ensure long service life of bearings.
g) Only use experience Technicians for jobs such as; serving of electric motors, replacement of fuses, and wiring-work to avoid any disaster.

## 3.3 SAFETY AND HOUSE CLEANING OF FOOD PROCESSING CENTERS.

i. Daily, weekly and monthly cleanings of premises are highly commendable. (The Food and Drugs Authority and Ghana Standard Authority are very critical about such environmental cleanliness).
ii. Daily cleaning of equipment, pans and kettles before use and after usage are also commendable. This practice drives away fungus and insects which

contaminate the food that we process for consumption which may be poisonous to our health.

iii. Usually, use warm water and detergents for such cleaning works to remove all stains and dirt and bacteria that may come in contact with the food processed.

iv. Again, use clean rags, and clean clothing at all times when processing food for consumption.

We hope all of you would put such knowledge and skills acquired into good practice to help improve upon our food processing technologies.