

Article

Garbage Is Wealth

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Recycles Domestic and Urban Waste in Nairobi

BACKGROUND

The association was founded on January 1999 by 23 residents of Kayole Estate. The number rose to 200 with time. Registered as a community based organization (C.B.O) in the year 2000.

The association was founded with the following objectives: -

- To compliment Nairobi City Council's efforts in solid waste management.
- To generate income for the youth.
- To mobilize Kayole residents in improving their living environment.
- To enhance and create awareness on solid waste management.
- To turn garbage into WEALTH through production of quality marketable products.

Before 1999, the estate ecosystem necessary to sustain it was threatened it was threatened because of Nairobi City council failure to collect and dispose garbage which resulted to irresponsible domestic garbage dumping. Every household and market vendors took any open space as a dumping site.



All empty spaces looked like this

Water borne diseases e.g Malaria, Typhoid and Cholera increased so much. We decided helping ourselves by starting garbage collection subscription services.

ACTIVITIES

Nowadays collect and dispose garbage for 120,000 households for a fee of Kshs 120 per month per household.



This is the cheapest means of transport.

Sorting Out techniques

Composting procedure

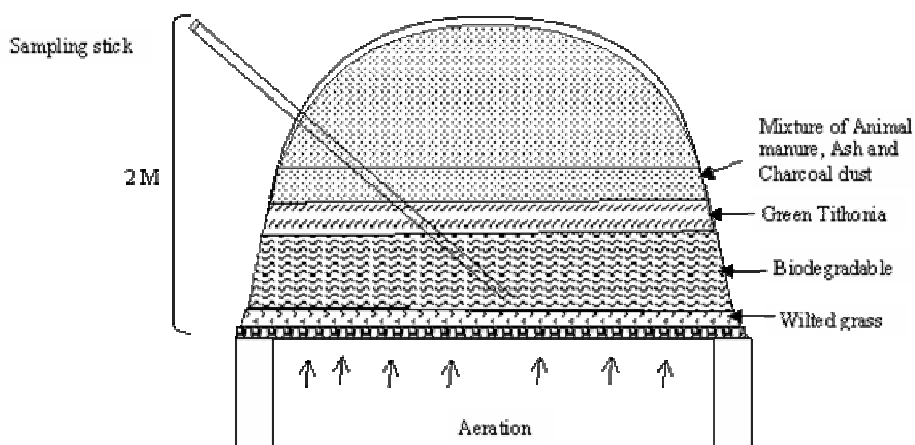
Before you think to start composting the following measures should be observed

1. Estimate the biodegradable to be composted
2. Construction composting fathom
3. Contraction storage shed
4. Estimation of end product using Xbe fomula
5. Package

(1) The materials to be composted and its available



Sorting Out techniques



Procedure of composition

determine by the size of composting platform. The sizes of the platform are also determined by availability of land. The known dimension is the height which should not be more than 2 m, the length is determined by the above two factors, but the suitable width should be 4 m e.g a platform of 2 x 4 x 20 M will hold 160 M³ of which 160 Kg.

There are several parameters of measuring e.g Lorries, Wheelbarrows, handcarts etc. To be visionable you must calculate what you expect after composting bearing in mind 60% will get lost in form of water left with 40% to be the manure you will expect after composting.

Composting platform should be raised from the ground and having a mesh wire to allow air in the compost, the aeration is important in composting.

Procedure of composting

1. After construction of composting platform you start
2. with a layer of wilted grasses chopped about 5 cm

and sprinkled it with water

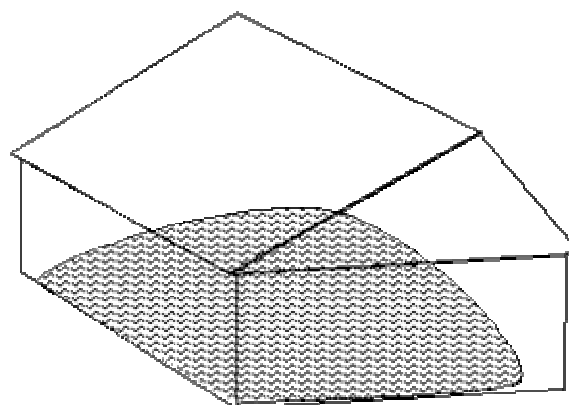
3. A layer of Biodegradables
4. A layer of Green Tithonia
5. A layer of a mixture of animal manure, ash and charcoal dust

Organic resource management

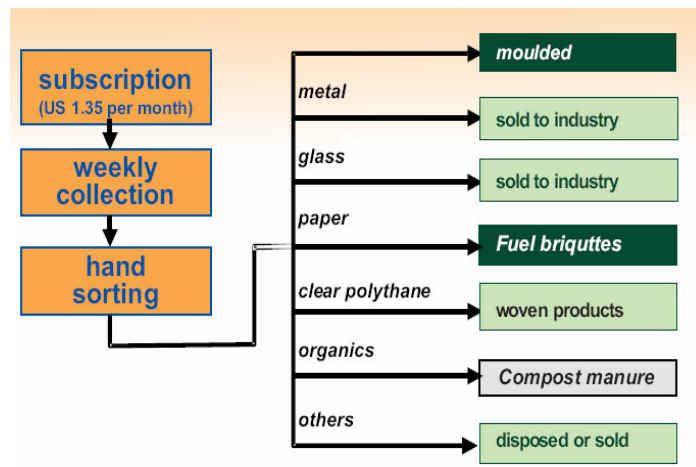
Storage shade

At our disposal site we sort out composting materials from non – biodegradable urban wastes. Using the composting materials, which is in abundance green tithonia, animal manure mixed with ash and charcoal dust, fortified with D.A.P in our composting platform process we produce wonderful organic fertilizer. We store our compost in a cool dry place away from sunlight for at least 2 month to save Nitrogen loses and our compost to be homogenous. Good compost has a uniform colour and a pleasant smell. We park our compost in 10, 20 and 50 kilo pack-

kets. Our prices are Kshs 10 per kilo. Our customers are urban and pre – urban farmers.



Storage Shade



Recycling Strategies

Capacity Building

Making fuel briquette to conserve the forests

Briquetting started in Europe by urban poor in the 17th Century the practice continued during the 1st world war, they used cow dung and the binder tar

Briquetting materials

1. Rice husk
2. Sawdust
3. Bagasse
4. Coffee husk

Plastics

Plastics in daily use are of two types;

- Thermal plastics
- Thermal setted.

Thermal setted plastics are not in common usage in special areas e.g. motor vehicle parts.

The binders are papers and clay

Industries in Kenya produce 8000 tones of plastic daily high and low density. These plastics being the main pollutants of our urban centres KEMA decided to reuse and recycle them.



The binders are papers and clay

Reusing

In reusing we started by making the following: mattress, pillows, cushions, lampshades, waste paper baskets, hats, handbags.

We classified our handbags from the ordinary kikuyu large bags: patriotic handbags & modern ladies bags It is our intention to create employment of 3000 people by production of handbags. KEMA requests for your support to accomplish our dreams.

Recycling

Low and high-density plastics of all colours and sizes all put in a plastic heating hopper, heated to about 120°C. The hot plastic in liquid form is scooped with radder into a fencing post mould or roofing file mould Plastic-roofing files KEMA is the only one recycling thermal plastics into roofing fill in Africa.



Mattress, Pillows, Hats, waste paper baskets etc



Benefit of KEMA roofing tiles

Our roofing tiles are not brittle like others. You can harvest rain water and drink, others cannot. All these layers must be sprinkled

When the compost reaches 2 m high it's covered with black polythene paper if not the whole process is repeated again.

Checking the composting

A sampling stick is put across the compost to check whether the composting is taking place once per week. When the sampling stick is put across and then pulled out and found to be warm that is an indicator that the composting is taking place. The process is repeated once per week for three weeks. After the third week the

compost is transferred to the second waiting composting flat form, and then compost will remain in the second flat form for armoring three weeks. At the end of the 6th week.

The sampling stick is put across the compost and after being pulled found to be having a whitish substance that is an indication the compost is ready.

Nb: it is ready but not ready to be used.



Conserve your forest (because there are no trees left the present tree cover is 1.5% against 10% recommend

Organic resource management storage shed. The manure is transferred to storage shed for it least 2 months.

It is shared to save nitrogen losses. How does good compost look like?

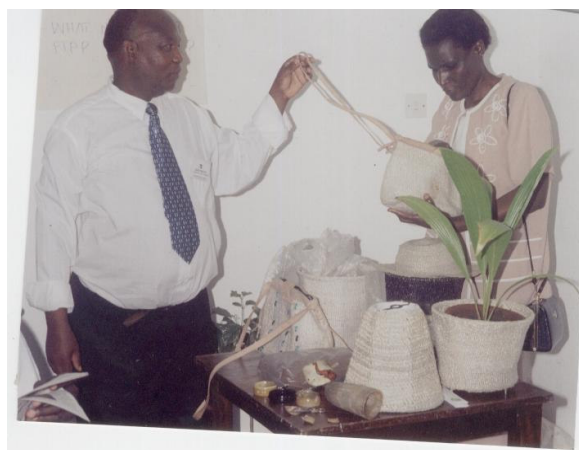
A well-managed organic fertilizer should be free from pathogeous and homogeneous. Uniform in colour and pleasant smell.

Storage shed

Compost storage should be roofed with a nice floor.



Termite proof fencing Posts, Handbags

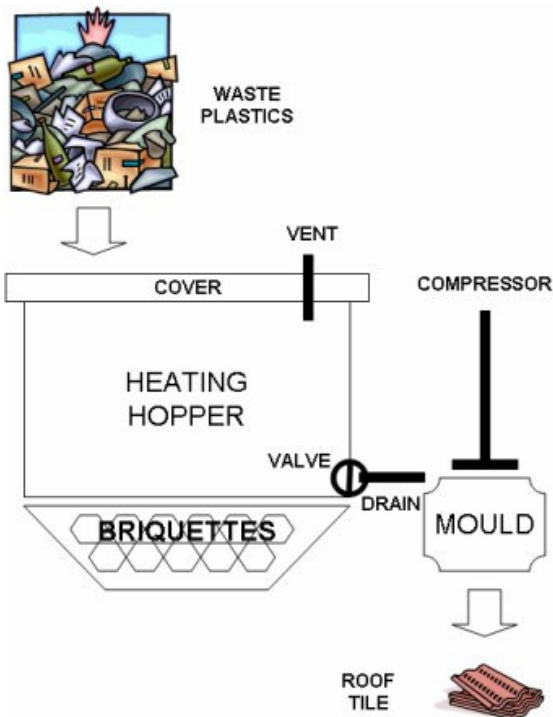


Lamp sheds, Potting Vessels

Recycling Processes

This is the only plastic roofed structure in East Africa Our tiles are not brittle cannot fade and everlasting.

Capacity building center Kema offer the following short courses



Recycling Processes



1. Organic resource management
2. Solid waste management (Recycling of Plastics)
3. Briquetting
4. Managerial mathematics

KEMA has trained 4,000 people who are members of many neighbourhood associations.

Challenges

- ❖ Negative attitude towards
- ❖ Recycled products



Plastic roofing structure



Urchins being trained by KEMA on briquetting to save the forests
Conserve the Forest by using Fuel Briquettes

- ❖ How to make the plastic products fire-resistant
- ❖ How to minimize emissions from burning plastics
- ❖ Non payment by some subscribers
- ❖ Lack of environmental awareness by residents.

Achievements

- ❖ At the moment there are 120,000 household subscribers.
- ❖ KEMA has employed 400 people 180 women and 220 men
- ❖ Cleanliness of Kayole Estate has improved.
- ❖ A massive amount of domestic waste is available for recycling in Nairobi, much opportunity exists for new groups
- ❖ The KEMA model is applicable to other urban areas in Kenya and elsewhere in Africa As a result of KEMA model, the Nairobi City Council is in the process of reviewing its by laws to accommodate similar activities by other groups.

Replication

KEMA has trained four thousand people, three thousand Kenyans and one thousand Tanzanian from Musoma and Mwanza belonging to seventy groups, who are replicating KEMA's activities. Voi municipal council is only municipal council in Kenya, which is actively involved, in environmental education on their employees.



Sustainability

Because of availability of resources and labour and so long as you people flock in urban centres yearly eat and produce domestic waste in your kitchen KEMA will remain in business.

CONCLUSION

Garbage is wealth which should be taken very seriously particularly by local authorities. Nairobians produces 720,000 tones of garbage. 504,000 tones are biodegradable can be composted to 201,600 tones valued Kshs $\times 1,000 = 2,016,000,000$.

COLLABORATORS

Kema collaborates with the following institutions and organization:

- ❖ Jomo Kenyatta University College of Agriculture Technology
- ❖ KIRD
- ❖ Clean up the world
- ❖ NEMA
- ❖ Practical Action
- ❖ Nairobi Garbage Recyclers
- ❖ World Vision International.



- ❖ We also give thanks to Jomo Kenyatta University College of Agriculture for their healthy Collaboration.
- ❖ Thanks to Practical Action for Making KEMA to progress.
- ❖ Dr. Paul L. Womer for his financial support.
- ❖ Erick Morris for making KEMA TO GROW by marketing its products
- ❖ Dr H. Gichuki Nairobi university
- ❖ Pro M.J. Ntiba Nairobi university
- ❖ Dr. Charles M.M. Ondiek

Garbage can be recycled or reused think about it!

COMPLEMENT

- ❖ Special thanks to FORMAT for promoting KEMA.
- ❖ Special thanks to WOLRD VISION INTERNATIONAL for sponsoring KEMA training.