

Full pdf print of Online Catalogue:

LOCAL SUSTAINABLE SOLUTIONS IN EAST AFRICA

www.localsolutions.inforse.org

Collection of Successful Cases of Sustainable Energy and Climate Solutions in Kenya, Uganda, and Tanzania.

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Aniga Energy Efficient Cookstoves





Why to choose this solution?

The Aniga cookstoves are efficient, affordable, and have been improved to reduce their average wood consumption, which will in the long run reduce deforestation. More immediately, with proper venting, it reduces dependence on and health damages from open-fire cooking, which otherwise often subjects women and children to bouts of coughing and eye irritation.

Savings per day or production:

The stove uses around a third of the wood consumed by a traditional cooking fire. It saves up to 50% of the fuel.

Cost in money and in own time to construct:

The stoves are sold at a price between KSh 1500 - 2000 (USD 15 - 20).

Lifetime:

10 years.

Maintenance needed:

Repair of the clay liner as needed.

Resources needed in use:

Fuelwood.

Problems and limits:

The stove produces some smoke, therefore good ventilation is needed in the kitchen.

Where and how can you get it or make it?

It is available at Aniga Community Based Organization (CBO) in Seme sub-county, Kisumu County, Kenya.

Skills needed to produce, install. maintenance, use:

Production of the stoves requires training in stove production, done by Carbon Zero (Kenya). Use of the stoves requires only a short introduction.

How to use it:

To be added.

How to maintain it:

To be added.

Climate effect (if any):

The use of stoves reduces carbon emissions and saves about 50% of fuelwood. Hence, fewer trees are cut.

Why is it successful?

Successful because they are affordable, and lower than an open fire in smoke generation. The raw materials

are available locally in Kisumu.

If you can make it, a short description, typical problems, materials needed:

It is a simple process that involves sourcing sand from the lake shores as well as buying a few bags of cement and the metallic parts. Manufacture involves kneading clay, mixing concrete, and binding these to come up with the stoves.

How to make it (if possible):

To be added.

How is it delivered and by whom?

The Aniga Women Initiative has more than 50 members, who make energy-saving cooking stoves and sell them directly to consumers at affordable prices. The women have been trained on stove production, marketing, and promotion.

Successful financial model

Support for development: Financial support, and training by the UK organisation Global Footsteps.

What policies and strategies helped the success?

Effective collaboration among the women in Aniga Women Initiative, and effective collaboration between the Aniga women members and the UK-based international organization, Global Footsteps. Thorough training in stove production and marketing.

More info:

https://anigawomeninitiative.or.ke/shop/environment/cookstoves/ and
https://global-footsteps.org/index.php/2020/05/04/aniga-women-initiative/ .
https://co2balance.wordpress.com/2016/06/14/making-it-work-local-community-engagement-and-leadership/

Sources:

Aniga Women Initiative, Seme, Kisumu, 40100, Kenya. Tel: + 254 717-103667, E-mail: info@anigawomeninitiative.or.ke

Case uploaded:

2020-09-30

Efficient Fish-Frying Firewood Stove (SAFISTO)





Why to choose this solution?

SAFISTO is an efficient firewood stove designed for fish-frying purposes. Fish is a product that can spoil very fast, particularly in the tropical heat along the coastal districts. Fish-frying in Tanzania is one of the industries known to consume a significant volume of wood. Firewood is one of the main sources of energy for fish processing. The type of stoves used is an open fire which consumes a lot of firewood. SAFISTO stove has thermal efficiency ranging from 50% to 60% as opposed to a three- stone fireplace with thermal efficiency ranging from 10% to 15%. SAFISTO stove reduces firewood consumption by 50% and also has the ability to take smoke out from the kitchen. Furthermore, SAFISTO reduces usersâ€™ risk of burns.

Savings per day or production:

SAFISTO reduces firewood consumption by 50% per day compared to three-stone fire places.

Cost in money and in own time to construct:

SAFISTO can be constructed in different sizes. It is built using burnt bricks, sand, lime, cement, and wire mesh. Local masons charge labour between 60,000 TSh to 75,000 TShs (USD 26-32) per stove. Materials for constructing a SAFISTO that is 100 centimeters wide costs about 250,000 TSh (USD 108). Construction takes about two to three days.

Lifetime:

SAFISTO can last for more than three years if properly used and maintained.

Maintenance needed:

The chimney chamber needs to be cleaned regularly to avoid tar clogging and requires occasional repair in case of cracks in the stove.

Resources needed in use:

The stove use firewood.

Problems and limits:

Requires dry firewood chopped into medium size pieces. Performance of the stove might be affected if dimensions are not observed and followed during construction.

Where and how can you get it or make it?

The stove is available in Tanzania, designed and promoted by TaTEDO.

Skills needed to produce, install. maintenance, use:

Construction of SAFISTO stove requires skilled masons. Major repair and maintenance may also require skilled masons; otherwise, the trained operator may clean the chimney and do minor maintenance of the stove.

How to use it:

To be added.

How to maintain it:

To be added.

Climate effect (if any):

Contributes to reducing GHG emissions from wood sources. Reduces the amount of firewood required for fish-frying, leading to a reduced number of trees harvested for firewood demands.

Why is it successful?

SAFISTO achieves efficient firewood combustion and maximizes heat transfer to the fish-frying pan.

If you can make it, a short description, typical problems, materials needed:

N/A

How to make it (if possible):

How is it delivered and by whom?

Main actors include TaTEDO, local trained artisans, fish processors and beach management units (BMUs). BMUs are involved in mobilizing the fish processors within their localities and in monitoring the performance of thestoves. TaTEDO is responsible for awareness-raising, stove demonstrations, and capacity-building of ToTs on construction and maintenance of the stove. Whenever new inquiries are received, the trained ToTs become responsible for providing the service.

Successful financial model

Grant and subsidies through the project were used to disseminate the SAFISTO during its introduction to the local communities.

What policies and strategies helped the success?

The role of improved cookstoves is realised in the national Energy policy of 2015, Tanzania SE4ALL action agenda, draft Biomass Energy Strategy (BEST), and the draft Energy Efficiency Strategy of 2018. Also, there has been support from various development partners.

More info:

https://www.tatedo.or.tz/

Sources:

TaTEDO, MbeziJuu, Mpakani Road, Goba, House No GOB/KZD/883, P. O. Box 32794, Dar es Salaam, Tanzania. Tel: +255 738-201498, E-mail: energy@tatedo.or.tz.

Case uploaded:

2020-09-17

Jiko Tosha





Why to choose this solution?

The multi-purpose fuel cooking stove (Jiko Tosha) is an improvement on the currently available rocket stoves that use a single type of fuel, either firewood or charcoal. Jiko Tosha stove accommodates the use of several fuel forms, animal wastes, firewood, charcoal/briquettes, sawdust, biogas, and LPG. Any of these will work in the same stove unit. The Jiko Tosha stove was born out of shortcomings identified in the stoves existing in the market. Its advantages are that it reduces indoor emissions, provides a safe and healthy environment to the consumer, accommodates more than one fuel source according to availability, and ensures that the users have access to economical and affordable cooking technology.

Savings per day or production:

Savings of about 70% of charcoal consumption per day for a normal family.

Cost in money and in own time to construct:

Costs KSh 5000 (About USD 50).

Lifetime:

About 5+ years.

Maintenance needed:

F&M Industries does not have local technicians throughout Kenya. If a part of the stove breaks or gets damaged, it can be shipped to the F & M manufacturing plant in Nairobi for repairs. To move the product from one place to the other, manufacturers use an existing local transport system. Replacements for all the components of the stove are available.

Resources needed in use:

Manufacturers specify that this four-in-one clean-energy stove was designed to use gas, charcoal briquettes, sawdust, or firewood as cooking fuels.

Problems and limits:

Safety concerns when using the product with biomass or charcoal as fuel are primarily related to harmful emissions of carbon dioxide, carbon monoxide, and sulfur dioxide, along with gas leakage during use with gas fuel. Another significant safety concern is domestic accidents such as accidental burning or spill-overs.

Where and how can you get it or make it?

The product is available at F & M industries along Lunga Lunga Rd, Industrial Area, Nairobi, Kenya. The users can purchase the product directly from the manufacturer and also buy online through the F & M industries website.

Skills needed to produce, install. maintenance, use:

The Jiko Tosha is manufactured in Kenya by a locally trained workforce. The manufacturing site consists of an assembly line and works on a batch production basis. Most of the parts are manufactured with power hand

tools, welding machines, and a semi-manual pressing machine, except for the outer casing and combustion chamber, which are manufactured using a sheet-metal-rolling machine. The use of the finished product requires a short introduction.

How to use it:

Jiko Tosha when using gas- https://youtu.be/2TAnT8oeBDw and Jiko Tosha when using firewood-https://youtu.be/w_bziRiCx3o and Jiko Tosha when using charcoal briquettes-https://youtu.be/U8h42ZeHLgk .

How to maintain it:

To be added.

Climate effect (if any):

Testing carried out by the Kenya Industrial Research and Development Institute (KIRDI) on the stove CO2 and particulate emissions (g/MJ delivered to pot) determined that, while using LPG as fuel, the CO2 emissions were very low (0.38). When tested using charcoal, the stove emissions were average and fairly good (9.09) respectively. Source: https://www.engineeringforchange.org/solutions/product/jiko-tosha/

Why is it successful?

Its success lies in functioning as a four-in-one stove that can run on gas, charcoal briquettes, sawdust, or firewood, hence not limited to one particular fuel type. This product is known for bringing immense savings and higher efficiency.

If you can make it, a short description, typical problems, materials needed:

The Jiko Tosha is a multi-fuel cookstove that integrates traditional components of a rocket stove with single-burner gas-stove components. Rocket-stove design contributes an insulated combustion chamber, elevated steel grate, ash collector, and cast-iron pot support; gas stoves inspire the single-burner stove components such as an LP burner and LP regulator. The design also includes a stainless-steel adaptable fuel bed for briquettes and charcoal. Specifications; Height: 30 cm Outside diameter: 26 cm, Weight: 5.807 kg.

How to make it (if possible):

https://youtu.be/FKLnsrWguvI

How is it delivered and by whom?

The product can be obtained directly from the manufacturer (F&M Industries) and it can be delivered to customers through courier service provided by F&M Industries Ltd. Users can also obtain the product from local Cooperative societies (SACCOS), through which they can pay for the product in installments.

Successful financial model

Testing by organizations like Kenya Industrial Research and Development Institute (KIRDI), Training and monetary support by Kenya Climate Innovation Center.

What policies and strategies helped the success?

Complies with the following cookstove rating for the International Workshop Agreements as a streamlined process of the International Organization for Standardization (ISO):O. Emissions: LPG (Tier 5), Charcoal (Tier 2) PM Emissions: LPG (Tier 4), Charcoal (Tier 3) Thermal Efficiency: LPG (Tier 5), Charcoal (Tier 3).

More info:

Read more: https://www.fmindustries.co.ke/index.php/homeup . F&M Industries Ltd is developing a bigger version of the Jiko Tosha named Biko Tosha Max, the aim of the design is to be better suited for institutional use.

Sources:

F&M Industries Ltd. Lunga Lunga Rd, Godown No. 105, Narobi. http://jikotosha.co.ke/, Tel: + 254 720 338108.

Case uploaded:

2020-09-08

KIDT Briquettes Energy Saving Stove





Why to choose this solution?

Energy saving stove make cooking comfortable and economical as it uses little amount of briquettes fuel with provision to take out smoke through chimney.

Savings per day or production:

Save energy by 60%, 1-2kg of briquettes is enough per day for a normal family.

Cost in money and in own time to construct:

The household energy saving stove cost 1,500,000/=Tshs. To build energy saving stove made of bricks, cement and lime takes three weeks (one week for construction, another week for watering the stove and one week left to dry).

Lifetime:

5 to 10 years without major repair

Maintenance needed:

After 5 years, repair of plastic nylon is needed.

Resources needed in use:

Rice husks briquettes

Problems and limits:

Since Energy saving stove constructed by KIDT is permanently fixed, no flexibility to move it from one place to another.

Where and how can you get it or make it?

It is available at Kilimanjaro Industry Development Trust (KIDT) Moshi- Kilimanjaro in Tanzania.

Skills needed to produce, install. maintenance, use:

Construction require skilled and well-trained artisans.

How to use it:

https://youtu.be/P0gRFVG5840

How to maintain it:

N/A

Climate effect (if any):

The stove can reduce wastage by 60% leading to reduced demand for fuelwood. The stove also use briquettes made form rice husks which is renewable resource. The stove save up to 50 kg of wood charcoal per day for a school.

Why is it successful?

It is successfully because it is useful for household and institutional as it consumes little amount of briquettes compared to traditional stove. It also reduce cooking time and contribute to efforts to reduce deforestation.

If you can make it, a short description, typical problems, materials needed:

Briquettes should be used as directed by KIDT officials, avoid the use of large quantity that will result into unwanted high temperature

How to make it (if possible):

https://kidt-vtc.blogspot.com/

How is it delivered and by whom?

KIDT conducts training and seminars on importance, how to use and maintaining energy saving stoves. Production of bricks and construction of stove is done by KIDT to ensure quality control

Successful financial model

Cost for construction and maintenance are paid by customer

What policies and strategies helped the success?

Global interest on overcoming deforestation. Tanzania Forest Policy 1997 and Bioenergy Strategy (BEST) 2015 which identify promotion of improved cook stove as a means to address wastage of biomass due to use of inefficient technologies

More info:

njaujean@mail.co.tz

Sources:

KIDT- Kilimanjaro Industrial Development

Case uploaded:

2022-05-02

Okoa V5 Efficient Household Firewood Stove





Why to choose this solution?

Okoa V5 is an efficient firewood stove designed for household cooking purposes. The Okoa V5 stove has thermal efficiency ranging from 50% to 60% as opposed to a three-stone fireplace with thermal efficiency ranging from 10% to 15%. Okoa V5 reduces firewood consumption by 50% and also has the ability to remove smoke from the kitchen.

Savings per day or production:

Okoa V5 reduces firewood consumption by 50% per day as compared with a three-stone fireplace. It also accommodates more than one pot at a time. Use of a V5 reduces the time required for cooking and lessens indoor air pollution.

Cost in money and in own time to construct:

Field experience shows that local masons charge between 25,000 TSh to 30,000 TSh (USD 10.75 to 13) per stove. Okoa V5 is constructed using burnt bricks, sand, and cement, costing about 200,000 TSh (USD 86). Construction of the Okoa V5 stove takes one to two days.

Lifetime:

When mud is the material used to make the stove, its life span is estimated to be one year, increasing to two years if burnt bricks are used.

Maintenance needed:

The chamber of the chimney needs to be cleaned regularly to avoid tar clogging. The stove requires repair in case cracks emerge.

Resources needed in use:

The stove uses firewood. Okoa V5 can be constructed in different sizes. Okoa V5 can be built using local materials including, e.g., clay, anthill soil, rice husks/ grasses/pieces of sacks, and sawdust/ashes. It can also be built using burnt brick, sand, and cement. Sometimes, depending on user needs, ceramic tiles are used for finishing. Materials used for the construction of the stove need to be prepared in advance.

Problems and limits:

Requires firewood that is dry and that has been chopped into small pieces. The stove may not light well if the firewood used is not well dried. Performance of the stove might be affected if dimensions are not observed and used in construction.

Where and how can you get it or make it?

The stove is available in Tanzania, promoted by TaTEDO.

Skills needed to produce, install. maintenance, use:

Construction of the Okoa V5 stove requires skilled masons. Major repair and maintenance may also require a skilled mason. Otherwise, the trained operator may clean the chimney and do minor maintenance of the stove.

How to use it:

https://www.youtube.com/watch?v=95oNeWyA7KI&feature=emb_rel_pause

How to maintain it:

The chamber of the chimney needs to be cleaned regularly to avoid tar clogging. The stove requires repair in case cracks emerge.

Climate effect (if any):

The Okoa V5 stove contributes to reducing GHGs emissions by reducing the amount of firewood required for cooking, leading to reduced harvesting of biomass.

Why is it successful?

The Okoa V5 stove achieves efficient firewood combustion by maximizing heat transfer to the food being cooked. Hence, firewood consumption is reduced. Reduced household energy budgets for cooking lead to reduced deforestation.

If you can make it, a short description, typical problems, materials needed:

Not relevant, needs a skilled technician.

How to make it (if possible):

Not relevant.

How is it delivered and by whom?

Capacity-building on technical, business, and managerial issues is offered to masons. Masons are identified at the village level, then trained to construct, repair, and maintain the stove. They are also provided with the stove manual and with tools such as moulds. Trained masons provide such services to the community at a cost which is normally agreed with villagers during the introduction of the stove to the village.

Successful financial model

A market-based approach is used to disseminate the technology. TaTEDO plays a part in monitoring, especially the quality of the stoves.

What policies and strategies helped the success?

The Tanzania National Energy Policy of 2015, Tanzania SE4ALL action agenda, Tanzania Nationally Determined Contribution (NDCs), Draft Biomass Energy Strategy (BEST) and the draft energy efficiency strategy of 2018 recognize the role of improved cookstoves as one of the primary interventions to enhance energy efficiency. In addition, there have been various supports in terms of finance and technical know-how from development partners.

More info:

http://www.tatedo.or.tz

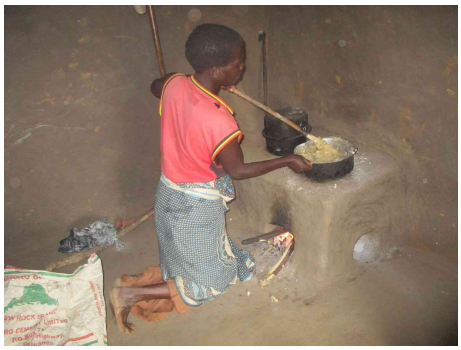
Sources:

TaTEDO, MbeziJuu, Mpakani Road, Goba, House No GOB/KZD/883, P. O. Box 32794, Dar es Salaam, Tanzania. Tel: +255738-201498, E-mail: energy@tatedo.or.tz .

Case uploaded:

2020-09-26

Rocket Lorena Two-Pothole Stove


Why to choose this solution?

The Rocket Lorena stove uses 50% less firewood compared to a three-stone cookstove. It cooks faster, since the fire is confined inside the stove, and produces less smoke. It is also easier to use than a three-stone fireplace, since the air inlet built into the stove eliminates the need to blow at the flames to keep the fire burning. It is safer to use, and it is affordable, since locally available materials are used. It also retains heat for a long time after cooking.

Savings per day or production:

According to Mrs. Mayanja Eva (a user trained by JEEP), the rocket Lorena stove uses 4-6 pieces of firewood for one to have a complete meal cooked. It saves energy and time because it has two potholes compared to the traditional (open) 3-stone fire stove. The Rocket Lorena stove is safe because, when it is made, an insulator i.e. dry grass is used, which creates air pockets. Hence, when cooking this prevents heat loss.

Cost in money and in own time to construct:

It costs between USh 20,000 - 30,000 (USD 5-8) to construct.

Lifetime:

4-6 years, unless it is left in rain or wet conditions.

Maintenance needed:

Any cracks must be repaired.

Resources needed in use:

Fire wood.

Problems and limits:

Produces smoke if constructed with no chimney.

Where and how can you get it or make it?

Skills needed to produce, install. maintenance, use:

Production needs a skilled/trained potter and maintenance and use needs a short introduction only.

How to use it:

How to maintain it:

Climate effect (if any):

Saves 50% of emissions, about 1.5 tons carbon-dioxide equivalent/year if saving is 2.5kg wood/day and there

is deforestation in the area Keeps heat for a long time.

Why is it successful?

It is made using locally available materials.

If you can make it, a short description, typical problems, materials needed:

Needs a skilled potter to construct using anthill soil, dry chopped grass / saw dust, water, and moulds.

How to make it (if possible):

How is it delivered and by whom?

Successful financial model

What policies and strategies helped the success?

NGO programs and support from development partners in training sessions.

More info:

JEEP, 7 Miles, Gayaza Rd, Kyanja, Kampala, P. O. Box 4264, Uganda. Phone: +256 (414) 578 316. E-mail: info@jeepfolkecenter.org, Web: https://jeepfolkecenter.org/

Sources:

Case uploaded:

2020-09-15

Rocket Stove by Caritas, Kitui





Why to choose this solution?

The stove emits less smoke, and consumes less firewood compared to the traditional stoves or cooking on three-stones. So it reduces incidences of diseases caused by smoke, and reduces work using it.

Savings per day or production:

This energy-saving Rocket stove reduces firewood consumption as it uses firewood in a smaller percentage.

Cost in money and in own time to construct:

With a subsidy from the Kitui Diocese, each stove costs KSh 3200 (about USD 32).

Lifetime:

About 5+ years.

Maintenance needed:

Repair the concrete part of the stove when broken.

Resources needed in use:

The stove uses firewood.

Problems and limits:

It Produces some smoke, so good ventilation is needed in the kitchen, the best is a kitchen hood. Some very poor households cannot afford the cost paid to the artisan after construction. As the training is donor dependent, there is a fear that once the project phases out, reaching out to other areas becomes a major challenge.

Where and how can you get it or make it?

Available in Kitui county and Maralal in Samburu county Kenya.

Skills needed to produce, install. maintenance, use:

Construction and maintenance of these Rocket stoves requires a well-trained artisan. The use requires a short introduction only.

How to use it:

To be added.

How to maintain it:

To be added.

Climate effect (if any):

The stove emits less smoke (black carbon smoke) and uses half the firewood of open fires or traditional fireplaces, which contributes to reduced climate change.

Why is it successful?

Because it uses less firewood, it takes women and children less time to fetch firewood, leaving them with more time for other activities. It also is easier to use, is relatively affordable, and emits less smoke.

If you can make it, a short description, typical problems, materials needed:

A standard rocket stove requires 50 bricks, a wheelbarrow of sand, ash, a bag of red oxide, and water.

How to make it (if possible):

To be added.

How is it delivered and by whom?

The stoves are constructed by Catholic Church in Kenya through Caritas departments in the dioceses, Kitui County and the Diocese of Maralal.

Successful financial model

Training the community, subsidy from the Kitui Diocese, successful partnerships, and support for development.

What policies and strategies helped the success?

Community sensitization by bishops and priests through groups such as Catholic women and men associations, Active campaigns for the stoves.

More info:

https://www.americamagazine.org/politics-society/2019/10/10/caritas-kitui-kenya-provides-energy-saving-cookstoves

Sources:

Caritas Kitui, Kenya. https://caritaskenya.or.ke/ Tel: +254 727 802810

Case uploaded:

2020-09-08

SeTa Improved Institutional Firewood Cookstoves (SeTA-IIFC)





Why to choose this solution?

SeTa-IIFC is an efficient firewood stove designed for institutions as well as for small and medium enterprises (SMEs) such as schools, colleges, prisons, hotels, restaurants, and any other mass- cooking places. The cookstove has a thermal efficiency of 54.82 %, which means it has the ability to reduce fuel consumption by more than 70% compared to three-stone fireplaces (TIRDO, 2020). The reduction of fuel consumption also implies that the stove contributes to a reduction of the institutionâ€™s cooking-energy budgets, allowing less time to be spent in cooking and contributing to environment conservation.

Savings per day or production:

According to evidence from stove users, the SETA-IIFC has the ability to save more than 70 % of fuel. For example, Mnolela Secondary school in Lindi Region, before it started using SETA-IIFC, required about 430 pieces of firewood each day for preparation of studentsâ€™ meals. Switching to the SETA-IIFC dropped that amount to 57 pieces per day. It means that if trees of 16 inchesâ€™ diameter at breast height (DBH) are harvested for firewood, this one institution reduces forest-harvesting from 2 trees to 0.25 trees per day.

Cost in money and in own time to construct:

The SeTA-IIFC is available in different sizes. According to the price list of 2020, the stove of 25 liters costs TSh 1,200,000 (USD 550), the 50 liters stove is TSh 1,600,000 (USD 730), a stove of 100 litres costs TSh 2,300,000 (USD 1045), and a stove of 200 liters costs TSh 3,500,000 (USD 1,600). The prices also include a stainless-steel pot. The fabrication of SeTA-IIFC stove and of its pot take about 5 days.

Lifetime:

The durability of SeTA-IIFC is more than 10 years.

Maintenance needed:

The chimney chamber needs regular cleaning to avoid accumulation of soot.

Resources needed in use:

Firewood or wood briquettes are used as fuel.

Problems and limits:

It requires a special pot, which means the pot has to be fabricated together with the stove. Bottom of the stainless steel pot has to be 3 mm thick to ensure its longevity.

Where and how can you get it or make it?

It is available at SEECO Company, Tanzania.

Skills needed to produce, install. maintenance, use:

The fabrication and assembling of the stove require skilled technicians. Major repair and maintenance may also require skilled technicians.

How to use it:

https://www.youtube.com/watch?v=PHzxpHBjrqk

How to maintain it:

Climate effect (if any):

The SeTA Improved Institutional Stove contributes to forest conservation. It reduces greenhouse-gas emissions, since the amount of firewood used for cooking is reduced.

Why is it successful?

It succeeds because the stoves have high efficiency due to good design for heat transfer, increased surface area for heat exchange, high efficiency of the combustion chamber for reduction of harmful emissions, and reduction of heat-energy loss by application of ceramic fibre blanket to areas where heat exchange take place.

If you can make it, a short description, typical problems, materials needed:

It needs a skilled technician to make it.

How to make it (if possible):

Not relevant.

How is it delivered and by whom?

SETa-IIFC is manufactured and delivered to end users by SEECO company.

Successful financial model

Support from development partners facilitated on-site placement of infrastructure, purchasing of some machines, marketing, awareness-raising, and training of the technicians. Income generated from sales of stoves covers the operational costs.

What policies and strategies helped the success?

The Tanzania Biomass Energy Strategy (BEST) and SE4All Action Agenda support production, business and utilization of efficient biomass stoves.

More info:

SEECO Company. Email: bioenergy@seeco.co.tz
https://sescom.co.tz/about-us/19-improved-and-modern-institutional-firewood-stoves-seta-is

Sources:

TaTEDO, MbeziJuu, Mpakani Road, Goba, House No GOB/KZD/883, P. O. Box 32794, Dar es Salaam, Tanzania. Tel: +255 738-201498, E-mail: energy@tatedo.or.tz, http://www.tatedo.or.tz

Case uploaded:

2020-09-29

Shielded Firewood Cookstove





Why to choose this solution?

The Shielded Cookstove saves firewood compared to a three-stone fireplace and produces much less smoke. The Shielded Cookstove makes cooking easier, since one does not need to keep blowing air to sustain the fire or to monitor the burning all the time. The Shielded Cookstove can be designed in such a way that it can use charcoal, briquettes or firewood, thus accommodating varying fuel sources in the local communities. It is movable, such that one can cook within the kitchen or outside the kitchen. The design minimises accidents and burns, since it is insulated and structured for safety.

Savings per day or production:

The Shielded Cookstove saves three times the amount of firewood than cooking on three-stones. It uses 3-5 pieces of firewood to cook a complete meal for a normal family.

Cost in money and in own time to construct:

The stove costs USh 10,000-20,000 (USD 2.7-5.5). It takes about 3-5 hours for a skilled person to construct a shielded cookstove.

Lifetime:

5 years, if it does not fall down during moving and is not left outside during raining.

Maintenance needed:

In case of any crack developing on the stove, fill it with a piece of soil that that was used during construction. This is encouraged to be done between the time of construction to the time when the stove is completely dry and even during the period of stove usage.

Resources needed in use:

Dry pieces of firewood, charcoal, or briquettes.

Problems and limits:

Smoke production depends on the nature of fuel used. However, this stove reduces the smoke as much as possible. Good kitchen ventilation is important, and users should always use dry firewood. There are quality problems with potters that do not follow precise guidelines and measures to make it correctly, which results in consumersâ€™ feeling discouraged about the use of shielded cook stoves.

Where and how can you get it or make it?

JEEP promotes these stoves through training of trainers (TOTs) in various parts of Uganda. Contact us to get you to our nearest service provider (TOT) to your location.

Skills needed to produce, install. maintenance, use:

Production needs a skilled person; maintenance and use need short introduction only.

How to use it:

Not relevant.

How to maintain it:

Not relevant.

Climate effect (if any):

Reduces greenhouse gas emissions around 1,4 tons CO2/year.

Why is it successful?

It is successful because of its efficiency, limited smoke (cleaner) and affordability. It is also portable, which means that one can use it both in the kitchen and outside the kitchen.

If you can make it, a short description, typical problems, materials needed:

Needs a skilled person to make. Materials needed to make it include; dry grass, leaves, sawdust, coffee husks, rice husks, water and anthill, clay soil.

How to make it (if possible):

To be added.

How is it delivered and by whom?

Business model is production by TOTs (Trainers of Trainers) who will build these stoves in the homes of those who will have picked the interest in the energy saving shielded stove. The price of the stove will like be negotiable depending on the distance moved, availability of materials, assistance given and financial status of someone. Skilled potters / TOTs are also crucial in maintaining the quality.

Successful financial model

Support for development, trainings, and establishment of organised TOTs union.

What policies and strategies helped the success?

Government has set strict laws against deforestation. The government has encouraged the researchers / NGOs / CSOs to come to come up strategies of minimising wood (fuel) consumption during the cooking. Additionally, many actors from the private sector are taking part in the fight for climate change and are trying their best to promote efficient clean energy technologies.

More info:

Read more: JEEP, 7 Miles, Gayaza Rd, Kyanja, Kampala, P.O. Bpx 4264, Uganda. phone: +256 (414) 578 316 E-mail: info@jeepfolkecenter.org. Web: https://jeepfolkecenter.org/

Sources:

Support for development, trainings, and establishment of organised TOTs union.

Case uploaded:

2020-10-15

Upesi Stove





Why to choose this solution?

The Upesi Stove meets the needs of its users for a clean, efficient, and fast-cooking stove that saves 40% firewood and that produces upto 60% less smoke compared to the three-stone open fire.

Savings per day or production:

Savings of up to KSh 7,200 (USD 72) per year. Rural wages average KSh 600 (USD 6) per month. KSh 20 (USD 0.20) on firewood per day.

Cost in money and in own time to construct:

Costs KSh 1000-4000 (USD 10-40).

Lifetime:

4 years.

Maintenance needed:

Occasional repair of ceramic liners.

Resources needed in use:

Dry firewood; can also burn crop waste, such as maize stalks and cobs, and animal dung.

Problems and limits:

Produces some smoke, so good ventilation is needed in the kitchen.

Where and how can you get it or make it?

Skills needed to produce, install. maintenance, use:

The production of ceramic liners requires pottery skills and training in stove installation. The ceramic liners are bought by marketing groups or installers. The ceramic liner is then installed into a hearth made from mud and stone.

How to use it:

https://youtu.be/TRXP8l4MKfc

How to maintain it:

Not relevant.

Climate effect (if any):

Fuel savings of 90 kg per month for each household using Upesi stoves, representing 40 % savings in fuel use, which can have a positive environmental and climate effect in terms of less felling of trees.

Why is it successful?

It is efficient, low in smoke, and affordable. The manufacturers are also known to the local market for the

quality of their products.

If you can make it, a short description, typical problems, materials needed:

Materials needed include clay liner, water, flat or round stones, anthill soil, and either murram or a mixture of soft sub-soil, sand and ash. It needs a skilled potter to make it.

How to make it (if possible):

To be added.

How is it delivered and by whom?

A number of organisations involved in renewable energy purchase the products directly for onward selling. In total, the group has 42 stable customers who purchase from them on a regular basis. Global Village Energy Partnership (GVEP) also facilitates networking for all players in the value chain, in order to ensure effective reach of energy products to the market. They have links with artisans in Kisumu town who buy their stoves in bulk. Actors or intermediaries involved in the marketing chain include stove producers, distributors, retailers, promoters, and installers.

Successful financial model

What policies and strategies helped the success?

The marketing strategy was based on insights gained from a visit to an ITDG / Practical Action stove project in Sri Lanka by produce and sell the stoves commercially within rural areas.

More info:

http://www.bioenergylists.org/stovesdoc/Kenya/05_Kenya.pdf , https://youtu.be/TRXP8l4MKfc .

Sources:

Keyo Pottery Women Group, Kisumu, Kenya.

Case uploaded:

2020-08-18

Wisdom Stove (Malaika Jiko, MJ/M2)





Why to choose this solution?

The MJ and M2 cookstove models are TLUD (Top Lift Upward Draft) gasifier biomass cookstoves. Using a few small sticks of firewood, the stove burns the wood, converting the smoke into a synthetic gas, which burns with minimal emission and a clean flame, allowing efficient cooking. As the wood burns, it is converted to charcoal through a thermal process called pyrolysis. The user thus produces charcoal while cooking with firewood. The charcoal continues to burn in the stove, which provides heat for extended cooking or can be saved for future use.

Savings per day or production:

According to the manufacturer, this cookstove saves up to 75% of fuel and also creates significant cost savings (1 sack of charcoal in KSh = cost of one MJ).

Cost in money and in own time to construct:

The Wisdom TLUD gasifier stove retails at KSh 3,500.00 (USD 35) and is exempt from Value Added Tax (VAT), a ruling made by the government of Kenya in June 2016.

Lifetime:

5 Years.

Maintenance needed:

The ceramic chamber can be replaced.

Resources needed in use:

The stove burns sticks of firewood (ideal wood is dry and broken into matchbox-sized pieces), maize comb, crostems, coffee husks, or dried biomass briquettes.

Problems and limits:

Wisdom also links up with Micro Finance Institutions (MFIs) to get access to more consumers, but unfortunately the MFI would not let Wisdom contact these customers directly to gauge end-user feedback, and this resulted in poor after-sales support. Wisdom teamed up with a Savings And Credit Cooperative Society (SACCO); however, this relationship also ended when it was found that the SACCO was not carrying out a key component of sales (stove demonstrations), which resulted in lack of understanding by end-users on how to use the stove correctly.

Where and how can you get it or make it?

The stoves are manufactured and distributed by Wisdom Innovations. The manufacturing facility is based in North Kinangop (Nyandarua County) in Kenya and expansion plans are currently on-going in Zimbabwe. The company has sold stoves all over the country, but decided to focus on four specific counties - Nakuru, Nyandarua, Narok, and Kiambu - in line with their current production capacity. It is possible to contact local technicians through customer care (contacts below).

Skills needed to produce, install. maintenance, use:

Production and maintenance require engineering skills and training in metal crafts. The user manual for Malaika Jiko stove is available in both English and Kiswahili. Instructions on how to use the MJ stove are available on the webpage of WisdomStoves.

How to use it:

https://youtu.be/d7ZitRn4Nnw

How to maintain it:

To be added.

Climate effect (if any):

The stove burns the wood, converting the smoke into a synthetic gas which burns with minimal emissions and a clean flame.

Why is it successful?

It burns with minimal emissions and clean flame, allowing efficient cooking. As the wood burns, it is converted to charcoal which continues to burn in the stove, and provides heat for extended cooking or can be saved for future use. Eliminates wait time for cooking, greatly reduces destruction of wood growth compared with current methods of charcoal production, and greatly reduces harmful smoke.

If you can make it, a short description, typical problems, materials needed:

The MJ is placed on top of a traditional improved Kenya jiko with a ceramic insert. Make sure the fit is snug and secure. Doors on the two stoves should be aligned and open. The M2 works independently, as the design includes a ceramic insert.

How to make it (if possible):

https://youtu.be/QrSHJFNqAFI

How is it delivered and by whom?

The company uses two business models; direct sales and low-cost credit. The stoves are distributed through microfinance institutions, SACCOs, dairy co-operatives/societies, and other organized groups. The stoves are delivered along with a training and follow-up session. Because the Wisdom Stove works quite differently from many other improved cookstoves available in the market, the company recognises the need for behavioural change by end-users, who are usually women. Most of their sales are done through referrals from satisfied end-users.

Successful financial model

Wisdom has established strong partnerships with many organisations, such as Kenya Forest Service and Kenya Climate Innovation Centre (KCIC). The SACCO provides, among other services, technical support, market platforms, networking opportunities, training, and mentorship, as well as an office space in Nairobi.

What policies and strategies helped the success?

Exempt from Value Added Tax (VAT), a ruling made by the government in June 2016 that has facilitated the growth of the innovative clean cookstoves (ICS) sector. Constant consumer awareness-raising and training is their priority, and they take pride in maintaining continuity with all their customers.

More info:

https://wisdomstoves.org

Sources:

Wisdom Stoves Kenya, P.O box 71, North Kinangop 20318, Kenya. Tel: +254 723241907.

Case uploaded:

2020-08-24

Burn Jikokoa







Why to choose this solution?

Burn Jikokoa are Rocket-type cookstoves for burning charcoal. They are long-lasting, use about 50% less charcoal, and cook faster than the ordinary Jiko. The Jikos come with a no-mess ash tray and reduce carbon-dioxide emission for a cleaner cooking environment. They have non-slip pot stands which grip all sufurias (cooking pot) firmly to ensure that you have a safer cooking experience. Available in black and red.

Savings per day or production:

Jikokoa uses about 50% less charcoal than the ordinary Jiko equivalent.

Cost in money and in own time to construct:

The Jiko costs KSh 3,500 (USD 35).

Lifetime:

3-4 Years, a 1-year warranty from date of purchase.

Maintenance needed:

Repair of broken parts.

Resources needed in use:

Charcoal.

Problems and limits:

The price of a Burn Jikokoa is a barrier for low-income households.

Where and how can you get it or make it?

Are available countrywide through an online selling platform called Jumia and also in the local supermarkets. The manufacturing facility for Jikokoa is situated at Ruiru town in Kiambu county, Kenya.

Skills needed to produce, install. maintenance, use:

Parts are installed by skilled certified technicians. Use of the Jiko requires a short introduction only.

How to use it:

Video: https://youtu.be/ZdBJ9G40GEs https://youtu.be/ufwU1WtFXpQ

How to maintain it:

Not relevant.

Climate effect (if any):

According to tests conducted by Berkeley Air and the University of Nairobi, the Jikokoa reduces PM 2.5 emissions by about 65% compared to the improved ceramic Jiko. They also use about 50% less charcoal, thereby reducing the number of trees cut. One Jikokoa stove reduces greenhouse emissions by up to 4.46 tons of CO₂ /yr.

Why is it successful?

Successful because they are fuel efficient, long lasting, and provide a cleaner cooking environment.

If you can make it, a short description, typical problems, materials needed:

Not relevant.

How to make it (if possible):

For illustration https://youtu.be/9LKP49NJMi4 and https://youtu.be/HRx2BhrJp3o

How is it delivered and by whom?

Business model is produced by skilled technicians. The facility has employed over 300 people, 60% of whom are women. Consumers can purchase online or through the organization through 180 distributors, including all of the major supermarkets and various small kiosks. Burn Jikokoa has a customer-service representative available for telephone contact.

Successful financial model

The Jikokoa has all the attributes, design, and pricing to produce the right packages for the customers. Over 900,000 sold since 2014.

What policies and strategies helped the success?

Burn followed Global Alliance for Clean Cookstoves design and performance standards of improved cookstoves.

More info:

https://youtu.be/9LKP49NJMi4 and https://youtu.be/HRx2BhrJp3o . https://burnstoves.com/, https://burnstoves.com/products/charcoal-stoves/jikokoa-classic

Sources:

BURN Stoves manufacturer. To view working models, visit site at the address: Go Downs 8-11, New Horizons Industrial Park, Ruiru, Kenya. P. O. Box 1921-00232. Phone: +254 706 585 629. Email: kenya@burnmfg.com. and globalsales@burnmfg.com.

Case uploaded:

2020-08-19

Efficient Household Charcoal Stove / SeTa-mkaa (2nd generation)





Why to choose this solution?

SeTa-mkaa is an efficient charcoal-burning stove designed for household cooking purposes. The cookstoves have a thermal efficiency of 50.8 % (TIRDO, 2021), which means they can consume less fuel than traditional metal stoves. Reduction of fuel consumption contributes to a reduction of household cooking-energy budgets.

Savings per day or production:

The material used in SETA-mkaa to conserve heat is a fiber blanket. The efficiency of SETA-mkaa stove is almost twice that of an improved charcoal stove made with clay liner. It can save more than 50% of fuel which would have been required to prepare meals per day.

Cost in money and in own time to construct:

According to the SEECO company 2020 price list, the stove is sold TSh 150,000 (USD 66). Fabrication of one piece of SeTA-mkaa stove is estimated to take half a day.

Lifetime:

The durability of SeTA-mkaa ranges from five to seven years.

Maintenance needed:

May need to repair the firing chamber in case it is overheated and damaged.

Resources needed in use:

Seta mkaa can use either wood charcoal or briquettes.

Problems and limits:

Pot bottoms of less than 2.5mm may melt with time due to high heat produced by the SeTa-mkaa stove.

Where and how can you get it or make it?

It is available in Dar es Salam, Tanzania through SEECO Company.

Skills needed to produce, install. maintenance, use:

Production of SeTA-mkaa, major repairs and maintenance requires skilled technicians.

How to use it:

https://www.facebook.com/watch/?v=521607365242679

How to maintain it:

Climate effect (if any):

SeTA mkaa stove uses less charcoal, therefore contributing to forest conservation by virtue of using fewer trees over time.

Why is it successful?

The design succeeds because of the stovesâ€™ high efficiency due to good design for heat transfer, increased surface area for heat exchange, high efficiency of the combustion chamber for reduction of harmful emission, and reduction of heat energy loss by application of ceramic-fibre blanket to areas where heat exchange takes place.

If you can make it, a short description, typical problems, materials needed:

Some of the materials needed include thick sheet iron and ceramic-fibre blanket. Several types of machines are required for cutting, moulding and joining different parts of the stove.

How to make it (if possible):

Not relevant, needs a skilled technician.

How is it delivered and by whom?

The business model involves production that starts at the workshop as well as marketing which is undertaken by SEECO social enterprise to ensure sales and continuous supply of quality stoves. Distribution goes through company sales points, and stove sales agents located in various locations within the country.

Successful financial model

Support from a development partner has been utilized as capital for purchasing some machines, for market promotion, for awareness-raising and for training of the three technicians.

What policies and strategies helped the success?

The production and marketing of improved cookstoves is supported by sectoral policies of business, environment, forest, and SMEs. Biomass Energy Strategy and SE4All Action Agenda (Tanzania) support the use of improved cookstoves.

More info:

SEECO Company, Email: bioenergy@seeco. co.tz, https://www.facebook.com/SEECOtz/, http://www.tatedo.or.tz

Sources:

TaTEDO, MbeziJuu, Mpakani Road Goba House No GOB/KZD/883, P. O. Box 32794, Dar es Salaam, Tanzania. Tel: +255 738-201498, E-mail: energy@tatedo.or.tz .

Case uploaded:

2020-09-26

Improved Charcoal Baking Oven (ICBO)





Why to choose this solution?

The Improved Charcoal Baking Oven (ICBO) is an efficient charcoal-fueled oven designed for households, institutions, and SMEs for baking bread, cakes, other foodstuffs such as nuts (groundnuts, cashew-nuts, etc.), potatoes, and bananas. The oven has the advantage of less charcoal consumption due to its ability to conserve heat. This ICBO also serves other purposes like cooking, heating, roasting, and baking.

Savings per day or production:

The oven has a thermal efficiency of 30 %. For less than half an hour, it uses only 600 grams of charcoal to bake 12 loaves of bread of 400 grams each.

Cost in money and in own time to construct:

The ICBO is available in different sizes. According to the price list of 2020, the small oven, which accommodates 12 bread loaves, costs TSh 350,000 (USD 152). The medium size, which accommodates 24 bread loaves, costs TSh 500,000 (USD 220). Local artisans take about a week to manufacture one oven.

Lifetime:

The ICBO, used intensively, can last for 5 years and for more than 10 years if used minimally.

Maintenance needed:

After two years, repair of the firing chamber might be necessary for an oven which has been used intensively. Regular cleaning of the baking chamber after baking is always required.

Resources needed in use:

Charcoal or charcoal briquettes as fuel.

Problems and limits:

Compared to an electric oven, there is a need to get used to the charcoal oven in regulating temperature for perfect results.

Where and how can you get it or make it?

It is available at SEECO Company, Dar es Salaam in Tanzania. The stove can be ordered from the SEECO company.

Skills needed to produce, install. maintenance, use:

Fabrication and repair of the oven requires skilled artisans. Use of the oven requires short training.

How to use it:

https://www.youtube.com/watch?v=YQBfRM81fzQ

How to maintain it:

Climate effect (if any):

ICBO uses less charcoal compared to traditional ways of baking. It contributes to forest conservation, as it reduces the amount of fuelwood which would have been required for baking where normal stoves are used.

Why is it successful?

It succeeds, in part, because it is suitable for small scale-baking businesses. It can be used in areas where there is no- or unreliable electricity. The ICBO has a high potential for generating income for users while cutting energy budgets, saving time, reducing emissions, and conserving forests.

If you can make it, a short description, typical problems, materials needed:

Making it needs a skilled technician.

How to make it (if possible):

How is it delivered and by whom?

The business model starts with production at the workshop and marketing by SEECO Company that ensures sales and maintains a continuous supply of quality ovens. SEECO either supplies the oven to end-users or distributes to end-users through sales agents. This is followed by training on how to use and maintain the oven. The main actors are the company, transporters, sales agents, and end-users including households, institutions and SMEs.

Successful financial model

Initial capital for infrastructure development, including the workshop buildings and equipment, partly was covered by grant funds. Operational costs are recovered from revenue generated through selling of ovens.

What policies and strategies helped the success?

The Tanzania Biomass Energy Strategy (BEST) and Sustainable Energy for All (SE4All) Action Agenda support development of the biomass-energy sector on demand- and supply sides. For many years, the sector also has been receiving great support from donor communities.

More info:

SEECO Company, E-mail: bioenergy@seeco.co.tz. https://www.facebook.com/SEECOtz/ , https://sescom.co.tz/seeco . http://www.tatedo.or.tz

Sources:

TaTEDO, MbeziJuu, Mpakani Road Goba House No GOB/KZD/883, P. O. Box 32794, Dar es Salaam, Tanzania. Tel: +255 738-201498, E-mail: energy@tatedo.or.tz

Case uploaded:

2020-09-26

Jiko Bora





Why to choose this solution?

The Jiko Bora stove is a metal ceramic charcoal-burning stove with efficiency ranging from 35% to 44% compared favorably to traditional charcoal stoves whose efficiency ranges from 18% to 22%. The higher efficiency of the Jika Bora stove contributes to reduced charcoal consumption.

Savings per day or production:

Savings of 50 % charcoal compared to traditional metal charcoal stoves.

Cost in money and in own time to construct:

The stove is available in various sizes, ranging from 9, 10, 11, 14, 18, and 22 inches in diameter. Depending on the size of the stove, the prices of the stoves start at 15,000 and can run up to TSh 150,000 equivalent to USD 6.5 to 65. The stoves have ceramic or clay liners enclosed with a metal body. The process to make the stove involves preparing the clay liner, partial sun drying, hardening by firing in the kiln, making the outer metallic body, and assembling the two parts together. Normally, preparation of liner and cladding (metal part) is done by two different production sections. It is estimated that producing one stove might take about 2 hours.

Lifetime:

1-4 years, unless dropped, overloaded with charcoal, or water poured frequently.

Maintenance needed:

If the clay liner breaks while the outer metallic part is still strong, it is possible to replace new one.

Resources needed in use:

Charcoal is the material needed to fuel the stove.

Problems and limits:

Where and how can you get it or make it?

Available in Tanzania, produced by SEECO company and other local entrepreneurs.

Skills needed to produce, install. maintenance, use:

Production requires a skilled potter and trained sheet-metal workers. To produce Jiko Bora stoves, 3-5 days of workshop training are needed. Maintenance and use require only a short introduction.

How to use it:

https://www.facebook.com/TaTEDO/videos/778253385604075

How to maintain it:

Climate effect (if any):

The stoveâ€™s higher efficiency rating reflects engineered improvement over previous models in its more effective conversion of charcoal to heat. Its emissions of smoke and of greenhouse gases are lower than those of older types of stove. Use of Jiko Bora also reduces the amount of charcoal that would have been required for cooking in traditional stoves, thus contributing to reduced deforestation.

Why is it successful?

It is successful because it is more efficient than traditional stoves in fuel consumption, thus saving money which would have been required to purchase charcoal. Increases in the prices of charcoal and of other fuels, particularly in urban areas, also motivates buyers.

If you can make it, a short description, typical problems, materials needed:

Sheet-iron, pottery-clay soil, and insulation/binding material (mixture of cement, vermiculate/rice ashes and water), along with training.

How to make it (if possible):

Requires short trainings.

How is it delivered and by whom?

The main actors in the supply chain for Jiko Bora include suppliers of raw materials, stove producers (SEECO, Sahara, etc.), stove sales agents, and end- users. Producers normally sell Jiko to the sales agents and then end-users buy from the sales agents. It is also possible for end-users to buy direct from the company. Sales agents are available everywhere in the country.

Successful financial model

Initial support was provided by development partners. In the past, the sector received some support from development partners, including investment capital to establish stove-production workshops, capacity-building, stove demonstrations, and awareness-raising. Development partners have also supported advocacy work and development of national strategies, guidelines, and laws.

What policies and strategies helped the success?

Charcoal Policy Study (World Bank 2009); Biomass Energy Strategy of Tanzania (2014), which has the ambitious target of reducing urban charcoal demand by 50% by 2030; and Sustainable Energy for All Action Agenda of 2015, with a goal of enabling more than 75% of the population in Tanzania to use cleaner cooking solutions by 2030. Stakeholders in the sector have also established the Clean Cooking Alliance of Tanzania (CCAT), which intends to coordinate the sector.

More info:

SEECO Company, E: bioenergy@seeco. co.tz , https://www.facebook.com/SEECOtz/ and https://www.facebook.com/TaTEDO/videos/778253385604075 .http://www.tatedo.or.tz

Sources:

TaTEDO, MbeziJuu, Mpakani Road, Goba, House No GOB/KZD/883, P. O. Box 32794, Dar es Salaam, Tanzania. Tel: +255 738-201498, E-mail: energy@tatedo.or.tz,

Case uploaded:

2020-08-27

Jiko Tosha





Why to choose this solution?

The multi-purpose fuel cooking stove (Jiko Tosha) is an improvement on the currently available rocket stoves that use a single type of fuel, either firewood or charcoal. Jiko Tosha stove accommodates the use of several fuel forms, animal wastes, firewood, charcoal/briquettes, sawdust, biogas, and LPG. Any of these will work in the same stove unit. The Jiko Tosha stove was born out of shortcomings identified in the stoves existing in the market. Its advantages are that it reduces indoor emissions, provides a safe and healthy environment to the consumer, accommodates more than one fuel source according to availability, and ensures that the users have access to economical and affordable cooking technology.

Savings per day or production:

Savings of about 70% of charcoal consumption per day for a normal family.

Cost in money and in own time to construct:

Costs KSh 5000 (About USD 50).

Lifetime:

About 5+ years.

Maintenance needed:

F&M Industries does not have local technicians throughout Kenya. If a part of the stove breaks or gets damaged, it can be shipped to the F & M manufacturing plant in Nairobi for repairs. To move the product from one place to the other, manufacturers use an existing local transport system. Replacements for all the components of the stove are available.

Resources needed in use:

Manufacturers specify that this four-in-one clean-energy stove was designed to use gas, charcoal briquettes, sawdust, or firewood as cooking fuels.

Problems and limits:

Safety concerns when using the product with biomass or charcoal as fuel are primarily related to harmful emissions of carbon dioxide, carbon monoxide, and sulfur dioxide, along with gas leakage during use with gas fuel. Another significant safety concern is domestic accidents such as accidental burning or spill-overs.

Where and how can you get it or make it?

The product is available at F & M industries along Lunga Lunga Rd, Industrial Area, Nairobi, Kenya. The users can purchase the product directly from the manufacturer and also buy online through the F & M industries website.

Skills needed to produce, install. maintenance, use:

The Jiko Tosha is manufactured in Kenya by a locally trained workforce. The manufacturing site consists of an assembly line and works on a batch production basis. Most of the parts are manufactured with power hand

tools, welding machines, and a semi-manual pressing machine, except for the outer casing and combustion chamber, which are manufactured using a sheet-metal-rolling machine. The use of the finished product requires a short introduction.

How to use it:

Jiko Tosha when using gas- https://youtu.be/2TAnT8oeBDw and Jiko Tosha when using firewood-https://youtu.be/w_bziRiCx3o and Jiko Tosha when using charcoal briquettes-https://youtu.be/U8h42ZeHLgk .

How to maintain it:

To be added.

Climate effect (if any):

Testing carried out by the Kenya Industrial Research and Development Institute (KIRDI) on the stove CO2 and particulate emissions (g/MJ delivered to pot) determined that, while using LPG as fuel, the CO2 emissions were very low (0.38). When tested using charcoal, the stove emissions were average and fairly good (9.09) respectively. Source: https://www.engineeringforchange.org/solutions/product/jiko-tosha/

Why is it successful?

Its success lies in functioning as a four-in-one stove that can run on gas, charcoal briquettes, sawdust, or firewood, hence not limited to one particular fuel type. This product is known for bringing immense savings and higher efficiency.

If you can make it, a short description, typical problems, materials needed:

The Jiko Tosha is a multi-fuel cookstove that integrates traditional components of a rocket stove with single-burner gas-stove components. Rocket-stove design contributes an insulated combustion chamber, elevated steel grate, ash collector, and cast-iron pot support; gas stoves inspire the single-burner stove components such as an LP burner and LP regulator. The design also includes a stainless-steel adaptable fuel bed for briquettes and charcoal. Specifications; Height: 30 cm Outside diameter: 26 cm, Weight: 5.807 kg.

How to make it (if possible):

https://youtu.be/FKLnsrWguvI

How is it delivered and by whom?

The product can be obtained directly from the manufacturer (F&M Industries) and it can be delivered to customers through courier service provided by F&M Industries Ltd. Users can also obtain the product from local Cooperative societies (SACCOS), through which they can pay for the product in installments.

Successful financial model

Testing by organizations like Kenya Industrial Research and Development Institute (KIRDI), Training and monetary support by Kenya Climate Innovation Center.

What policies and strategies helped the success?

Complies with the following cookstove rating for the International Workshop Agreements as a streamlined process of the International Organization for Standardization (ISO):O. Emissions: LPG (Tier 5), Charcoal (Tier 2) PM Emissions: LPG (Tier 4), Charcoal (Tier 3) Thermal Efficiency: LPG (Tier 5), Charcoal (Tier 3).

More info:

Read more: https://www.fmindustries.co.ke/index.php/homeup . F&M Industries Ltd is developing a bigger version of the Jiko Tosha named Biko Tosha Max, the aim of the design is to be better suited for institutional use.

Sources:

F&M Industries Ltd. Lunga Lunga Rd, Godown No. 105, Narobi. http://jikotosha.co.ke/, Tel: + 254 720 338108.

Case uploaded:

2020-09-08

Wisdom Stove (Malaika Jiko, MJ/M2)





Why to choose this solution?

The MJ and M2 cookstove models are TLUD (Top Lift Upward Draft) gasifier biomass cookstoves. Using a few small sticks of firewood, the stove burns the wood, converting the smoke into a synthetic gas, which burns with minimal emission and a clean flame, allowing efficient cooking. As the wood burns, it is converted to charcoal through a thermal process called pyrolysis. The user thus produces charcoal while cooking with firewood. The charcoal continues to burn in the stove, which provides heat for extended cooking or can be saved for future use.

Savings per day or production:

According to the manufacturer, this cookstove saves up to 75% of fuel and also creates significant cost savings (1 sack of charcoal in KSh = cost of one MJ).

Cost in money and in own time to construct:

The Wisdom TLUD gasifier stove retails at KSh 3,500.00 (USD 35) and is exempt from Value Added Tax (VAT), a ruling made by the government of Kenya in June 2016.

Lifetime:

5 Years.

Maintenance needed:

The ceramic chamber can be replaced.

Resources needed in use:

The stove burns sticks of firewood (ideal wood is dry and broken into matchbox-sized pieces), maize comb, crostems, coffee husks, or dried biomass briquettes.

Problems and limits:

Wisdom also links up with Micro Finance Institutions (MFIs) to get access to more consumers, but unfortunately the MFI would not let Wisdom contact these customers directly to gauge end-user feedback, and this resulted in poor after-sales support. Wisdom teamed up with a Savings And Credit Cooperative Society (SACCO); however, this relationship also ended when it was found that the SACCO was not carrying out a key component of sales (stove demonstrations), which resulted in lack of understanding by end-users on how to use the stove correctly.

Where and how can you get it or make it?

The stoves are manufactured and distributed by Wisdom Innovations. The manufacturing facility is based in North Kinangop (Nyandarua County) in Kenya and expansion plans are currently on-going in Zimbabwe. The company has sold stoves all over the country, but decided to focus on four specific counties - Nakuru, Nyandarua, Narok, and Kiambu - in line with their current production capacity. It is possible to contact local technicians through customer care (contacts below).

Skills needed to produce, install. maintenance, use:

Production and maintenance require engineering skills and training in metal crafts. The user manual for Malaika Jiko stove is available in both English and Kiswahili. Instructions on how to use the MJ stove are available on the webpage of WisdomStoves.

How to use it:

https://youtu.be/d7ZitRn4Nnw

How to maintain it:

To be added.

Climate effect (if any):

The stove burns the wood, converting the smoke into a synthetic gas which burns with minimal emissions and a clean flame.

Why is it successful?

It burns with minimal emissions and clean flame, allowing efficient cooking. As the wood burns, it is converted to charcoal which continues to burn in the stove, and provides heat for extended cooking or can be saved for future use. Eliminates wait time for cooking, greatly reduces destruction of wood growth compared with current methods of charcoal production, and greatly reduces harmful smoke.

If you can make it, a short description, typical problems, materials needed:

The MJ is placed on top of a traditional improved Kenya jiko with a ceramic insert. Make sure the fit is snug and secure. Doors on the two stoves should be aligned and open. The M2 works independently, as the design includes a ceramic insert.

How to make it (if possible):

https://youtu.be/QrSHJFNqAFI

How is it delivered and by whom?

The company uses two business models; direct sales and low-cost credit. The stoves are distributed through microfinance institutions, SACCOs, dairy co-operatives/societies, and other organized groups. The stoves are delivered along with a training and follow-up session. Because the Wisdom Stove works quite differently from many other improved cookstoves available in the market, the company recognises the need for behavioural change by end-users, who are usually women. Most of their sales are done through referrals from satisfied end-users.

Successful financial model

Wisdom has established strong partnerships with many organisations, such as Kenya Forest Service and Kenya Climate Innovation Centre (KCIC). The SACCO provides, among other services, technical support, market platforms, networking opportunities, training, and mentorship, as well as an office space in Nairobi.

What policies and strategies helped the success?

Exempt from Value Added Tax (VAT), a ruling made by the government in June 2016 that has facilitated the growth of the innovative clean cookstoves (ICS) sector. Constant consumer awareness-raising and training is their priority, and they take pride in maintaining continuity with all their customers.

More info:

https://wisdomstoves.org

Sources:

Wisdom Stoves Kenya, P.O box 71, North Kinangop 20318, Kenya. Tel: +254 723241907.

Case uploaded:

2020-08-24

BlueFlame BioGaz (Biogas) Digester







Why to choose this solution?

The BlueFlame BioGaz biogas-digesters are constructed from either concrete or plastic. They are safe to use for heating, for cooking, and for lighting. They can be used commercially or domestically. They also produce organic fertilizer that can be used safely and profitably in farmed fields. Such fertilizer is biologically very stable, and it has the following properties: very high nutrient content, very minimal pathogenic microorganisms, reduced odour, and ease of application because it is liquid.

Savings per day or production:

It saves the user the money that could have been used to pay for waste disposal. Moreover, it saves the user the money that could have been used to pay for commercial sources of energy. Such commercial sources of energy include LPG gas, electricity, charcoal, and firewood.

Cost in money and in own time to construct:

The price of a 4000-liter digester is KSh 75,000 (USD 750). Installation takes about 3 days.

Lifetime:

20 Years.

Maintenance needed:

BlueFlame energy solutions offers maintenance services for biogas systems to make sure they continue working to the satisfaction of our clients. It also rehabilitates non-working biogas systems to put them back into productivity.

Resources needed in use:

The bio-digesters accept any organic waste material, which may include biodegradable waste from industries and treatment plants, rotten food from shops and homes, biowaste that is given by consumers, sludge given from wastewater treatment plants, manure, and biomass from agriculture.

Problems and limits:

It is expensive; hence, most people are not able to afford it.

Where and how can you get it or make it?

Available at BlueFlame, a water- and energy- solutions company in Nairobi, Kenya. But they are also installed throughout Kenya. Interested clients can contact the BlueFlame company.

Skills needed to produce, install. maintenance, use:

Installation requires some training in engineering and biology; users receive a short introduction.

How to use it:

To be added.

How to maintain it:

To be added.

Climate effect (if any):

Not specified.

Why is it successful?

They succeed because they have a lifespan of over 20 years (long-lasting), they are easy to install, the plastic ones are portable, they come with a five-year warranty, and purchase comes with three months of free after-sales service.

If you can make it, a short description, typical problems, materials needed:

The biodigester consists of a sealed tank that holds biowaste and a means to collect produced gases. Use requires a way to mix the biomatter. One also needs to pipe off the gas and to dry off the effluent. When planning, one always needs to estimate how much organic waste can be collected in a day for putting in the tank and to consider which model of the digester is the best, as they are built differently (either concrete or plastic). One also must use adhesives and tools.

How to make it (if possible):

To be added.

How is it delivered and by whom?

The biogas digesters are delivered by skilled teams from BlueFlame Water and Energy Solutions Company. The field officers are contacted by clients who need the technology installed. The field officers then refabricate and install the system according to the clientâ€™s energy needs.

Successful financial model

Support for development, training, public relations, and successful partnerships.

What policies and strategies helped the success?

Kenya Biogas Programme (KBP), put in place to guide the operation.

More info:

https://www.blueflamebiodigesters.com

Sources:

Blueflame Water and Energy Solutions, Kahawa Sukari. Kahawa Sukari Avenue Nairobi, Kenya. Email: info@blueflamebiodigesters.com, Tel: +254 714 850418.

Case uploaded:

2020-09-14

Fixed Dome Biogas Plant





Why to choose this solution?

Biogas reduces the need for directly burning solid biomass fuels like firewood and charcoal and burns cleanly without producing smoke or ash. Biogas systems help make waste products productive, leading to improved health, better sanitation, and lower impact on the environment. Gases that are burned completely as fuel are not emitted into the atmosphere as GHGs.

Savings per day or production:

It saves money that could have been used to pay for commercial sources of energy or disposal of waste. Demand for firewood or charcoal and the workloads of women and children, are reduced by about 20% in households with biogas. Washing pots become an easier task in the absence of smoke and soot. Crop productivity improve due to use of slurry that remains after feedstock digestion.

Cost in money and in own time to construct:

It must be purchased due to the expertise and some materials required for construction. A biogas system of 9 m3 costs about TSh 2.5 to 3 million (USD 1080 to 1300). One mason takes five to seven days to construct a biogas system of 9 m3.

Lifetime:

About 20 years, if well operated and managed.

Maintenance needed:

Fermentation process needs a continuous supply of feedstock and water.

Resources needed in use:

Animal dung.

Problems and limits:

Capital investment for construction of biogas system is high making it un-affordable to low income families. The continuous supply of feed-stock and water to the biogas plant is a tedious work for the biogas owners.

Where and how can you get it or make it?

Skills needed to produce, install. maintenance, use:

Construction and installation of infrastructure to deliver gas needs a skilled mason and plumber, operation and maintenance needs a short training.

How to use it:

https://www.youtube.com/watch?v=XcBOy1R363c

How to maintain it:

https://www.youtube.com/watch?v=OYwUx5eOYEw

Climate effect (if any):

Biogas is a renewable source of energy and an efficient method for the conversion of biomass to energy. Renewable energies have always been identified as a prime source of clean energies that emit little or no net GHGs into the atmosphere. Biogas provides a means of mitigation to reduce the sources or enhance the sinks of greenhouse gases. One biogas installation saves an average of 8.5 tonnes of CO2 and 4,667 kg of wood per year.

Why is it successful?

Successful because it provides cleaner energy for cooking with low operation costs.

If you can make it, a short description, typical problems, materials needed:

Not relevant, needs a skilled mason to make it.

How to make it (if possible):

https://www.youtube.com/watch?v=PmBx5Zo8KZo

How is it delivered and by whom?

Through support of development partners, CSOs played major roles in awareness-raising, capacity building of local masons, technology dissemination, and advocacy. They also facilitated linkages of masons and potential consumers. Capital investment for a good number of biogas systems constructed initially was supported by grants. Ease of availability of masons has also contributed to the success.

Successful financial model

Subsidies were applied in most of the plants constructed under development projects. The simple payback period of a biogas installation varies between 2.5 and 9.5 years, depending on whether purchased charcoal or firewood, largely collected for free, is substituted.

What policies and strategies helped the success?

Biogas was introduced in Tanzania beginning in 1975. From 2009 to 2012, the Tanzania Domestic Biogas programme, coordinated by the government entity CAMARTEC, also contributed to initial efforts. After the program ended, further development was taken over by the private sector (the trained masons) and CSOs.

More info:

http://www.bibalex.org/Search4Dev/files/338190/171749.pdf

Sources:

https://www.tatedo.or.tz

Case uploaded:

2020-09-26

Fixed Dome Biogas Plant by Mchau





Why to choose this solution?

The solution provides alternative and clean energy for cooking instead of firewood and charcoal. Cow dung is the raw material used to feed the biogas plant to produce biogas which is used for cooking.

Savings per day or production:

Time and manpower which was earlier used to fetch firewood is now used to do something else. In a case where firewood was used, cost incurred per day was not less than 3000 Tshs.

Cost in money and in own time to construct:

The size of this Biogas is 4 m3 and costs Tsh.1,050,000. Construction of such biogas took about two (2) weeks.

Lifetime:

10 -20 years

Maintenance needed:

Biogas require daily feeding of the feedstock.

Resources needed in use:

Cow dung

Problems and limits:

Biogas plant require daily feeding of the feedstock, in some area where water is scarce becomes a challenge

Where and how can you get it or make it?

Available in livestock keepers regions of Tanzania. The technology is disseminated by TaTEDO, Carmatec, etc.

Skills needed to produce, install. maintenance, use:

Construction and maintenance of Biogas requires a skilled technician.

How to use it:

https://linksharing.samsungcloud.com/yWZtn03gD4tW

How to maintain it:

https://linksharing.samsungcloud.com/yWZtn03gD4tW

Climate effect (if any):

Biogas provide renewable source of energy free from GHG emissions and indoor air pollution.

Why is it successful?

After installation the operation costs is minimal

If you can make it, a short description, typical problems, materials needed:

Not applicable, needs a skilled technician

How to make it (if possible):

N/A

How is it delivered and by whom?

Community sensitization, availability of masons for installation of the biogas plant and provision of after sale services contributed to its success. Main actors in dissemination are CSOs, government agency, private sector and Faith Based Organizations. Almost all of them were involved in awareness raising, capacity building and installation of biogas systems.

Successful financial model

Involvement of private sector in the market chain

What policies and strategies helped the success?

The Tanzania Energy policy of 2015 focuses to encourage development and use of alternative energy to biomass for cooking. Also implementation of the Tanzania national Domestic Biogas programme

More info:

Email: ernestpmchau@gmail.com

Sources:

TaTEDO/Carmatec

Case uploaded:

2022-03-30

Fixed-Dome Biogas Plant by ECOSAFE Ltd





Why to choose this solution?

Clean energy, improved kitchen hygiene/ sanitation, and quality bio slurry (manure) that results in better yields (crops, fisheries, piggery) are co-benefits.

Savings per day or production:

Faster cooking saves time and money. For example, 1 kg of dry beans can be cooked in one hour with biogas (constant heat), which is not possible with firewood and charcoal. According to Mr Kasule, biogas user in Nakaseke, crop health and yields have improved since he started applying bio slurry to his banana crop, feeding it on his fish and pigs. Savings have occurred as a result of adopting this biogas energy option.

Cost in money and in own time to construct:

A 9 m3 biogas plant costs USh 1.8 million (approx. USD 493) and can be done in 7 days.

Lifetime:

25 years, according to ECOSAFE Ltd.

Maintenance needed:

0

Resources needed in use:

Small and medium farms for (zero-grazing) cows or pigs that can provide at least 75 kgs of cow dung per day.

Problems and limits:

Cost of setting up the biogas plant is expensive for many people. Managing biogas lamps, as moths and insects lead to tearing and breakages. High temperatures involved (650 to 700Â° C degree) mean generation of too much heat. Labour-intensive to sustain biogas production, as there must be daily stirring of feedstock dung in the mixing tank.

Where and how can you get it or make it?

ECOSAFE Ltd promotes the fixed dome biogas type biogas option.

Skills needed to produce, install. maintenance, use:

Persons must be trained and certified by Biogas Solutions Uganda Ltd in co-operation with Netherlands Development Organisation (SNV).

How to use it:

Video: https://www.youtube.com/watch?v=LuoqbV6AIAY

How to maintain it:

Climate effect (if any):

Smokeless homes with light from biogas as it reduces use of paraffin lanterns, one of the more frequent causes of fires in homes. Reduces use of firewood, which reduces cutting trees.

Why is it successful?

Cumulative fuel and other savings (fertilisers, medical etc.) of Ugshs 2,881,200 after 22 months of operation (Ecosafe Ltd) compared to 1.8 million Ugshs investment; Lifetime of 25 years means cumulative savings over a long period of time. Bio slurry (fertiliser by product) can be applied to crops for increased yields of up to 30%; insect repellant on bananas, oranges, coffee (Biogas Uganda Ltd & Sam Kasule); bio slurry is also an excellent nutritious feed for pigs -results in savings made on animal feeds; chicken manure, with its nuisance smell for urban farmers, can be used in recommended proportions as a source of feedstock for the biogas plant.

If you can make it, a short description, typical problems, materials needed:

Local materials needed: bricks, cement, gravel, metal fabrications, and skilled manpower.

How to make it (if possible):

Fine Biogas Solutions: https://vimeo.com/317936298

How is it delivered and by whom?

Involving micro-enterprises (like Ecosafe Ltd) for technical support to informal sectors and households in construction, operation, and maintenance of the fixed dome biogas plants; Ecosafe guarantee / customer care incentive for adoption, leading to other households getting interested in the biogas option.

Successful financial model

Renewable Energy Facility by Postbank provided opportunity for interested persons to acquire loans payable over a three-year period. ECOSAFE Ltd provided technical assistance and advice.

What policies and strategies helped the success?

ECOSAFE Ltd provides a one-year guarantee for the fixed dome biogas plant (with regular checks to secure proper use by the clients).

More info:

http://ecosafeltd.com/?service=fixed-dome-biogas-system

Sources:

Case uploaded:

2020-08-18

Flexi Biogas / FlexiTech







Why to choose this solution?

This technology minimizes reliance on firewood, makes cooking easier and produces less smoke (clean cooking) compared to ordinary cookstoves. It is helpful in solid waste management since it accepts a range of feedstocks, including biodegradable materials such as any animal dung (cow, pigs, sheep, goats, and rabbits), vegetable/kitchen waste, food waste, garden weeds, and market waste). The biodigester can help to control some economically harmful invasive plant species currently threatening crop security and public health.The systems that are designed to lower energy demands for daily household use are called "flexi domestic". They are installed in as few as three hours, produce gas in as few as three to five days, and run on any biodegradable material with no need for a cow. The larger-scale systems are built to meet bigger energy needs and are best suited to schools, hotels, churches, children group homes, and any other institutions with high energy demand; such larger systems are called T-rex.

Savings per day or production:

According to the Environmental Frame Conditions of Biogas Technology, this technology emits about 62% less carbon dioxide into the atmosphere. Flexi biogas domestic systems eliminate the task of firewood collection, so women gain three or four more hours a day for other activities. It saves the users about Ksh 500 (5 USD). Normally, the beneficiaries of this technology were spending over KSh 1000 (10 USD) per day on firewood to fry their fish, but now they spend only KSh 500 (5 USD).

Cost in money and in own time to construct:

The cost varies, as the domestic version (with capacity of 6 m3) costs KSh 75,000 (750 USD) and the large model costs (9 m3) is priced at KSh 90,000 (900 USD). It takes two to three hours for the Flexi domestic biogas digester to be prefabricated and installed, and about 6 days for the large commercial model.

Lifetime:

10 years.

Maintenance needed:

It is easy to maintain. It only requires feeding the system regularly with water and with feedstock materials (biodegradable materials such as any animal dung (cow, pigs, sheep, goats, and rabbits), vegetable/kitchen waste, food waste, garden weeds, and market waste), depending on gas usage. It also needs regular checking for any leakages and to be sure that the water pumps are in good working order.

Resources needed in use:

The system runs on all biodegradable materials such as any animal dung, vegetable/kitchen waste, food waste, garden weeds, market waste.

Problems and limits:

Potential customers often cannot afford them. There also is a lack of community familiarity with the benefits of biogas as a cooking option.

Where and how can you get it or make it?

The source, an eco-resource center, is situated at Ngong road, Mwitu Close (no 33), Karen, Nairobi, Kenya. In Kenya, Biogas International has installed the technology in Kakuma, Samburu, and Dunga in Kisumu as well as in Moi and Pwani Universities. Reference: Domnic Kahumbu Wanjihia, biogas international chief executive officer.

Skills needed to produce, install. maintenance, use:

Engineering skills and biological skills are required to install, along with a short course of training. An operation guideline is available at http://biogas.co.ke/wp-content/uploads/2018/06/Operation-Guide-Book.pdf for the users.

How to use it:

Video https://vimeo.com/366478108

How to maintain it:

https://vimeo.com/366479658

Climate effect (if any):

Saves about 62% of carbon dioxide emissions.

Why is it successful?

It succeeds because it is clean, environment-friendly, often affordable, sustainable, and simple to operate/maintain a biogas system. It also can be made to be portable, and the feedstocks are readily available.

If you can make it, a short description, typical problems, materials needed:

Assembling materials and ground-leveling are required, but trained personnel also are needed.

How to make it (if possible):

https://vimeo.com/366503023

How is it delivered and by whom?

The Flexi biogas is installed by skilled team employed by Biogas International Limited (BIL). The field officers are contacted by clients who need the technology installed. They then refabricate and install the system according to the client energy needs.Their customer support is always available to answer the clients questions and queries.

Successful financial model

Support for development, training courses, public relations; successful partnerships with various organizations and institutions like Kenya Association of Manufacturers (KAM), UNICEF, Moi, and Pwani Universities, among others.

What policies and strategies helped the success?

Kenya Biogas Programme (KBP), put in place to guide the operation.

More info:

http://www.biogas.co.ke

Sources:

Visit Flexi Biogas Solutions Eco-resource Center at Ngong road, Mwitu Close (No. 33), Karen, Nairobi, Kenya. Email: info@biogas.co.ke or biogasinternational@yahoo.com. Phone: +254-722 700 530

Case uploaded:

2020-08-19

Jiko Tosha





Why to choose this solution?

The multi-purpose fuel cooking stove (Jiko Tosha) is an improvement on the currently available rocket stoves that use a single type of fuel, either firewood or charcoal. Jiko Tosha stove accommodates the use of several fuel forms, animal wastes, firewood, charcoal/briquettes, sawdust, biogas, and LPG. Any of these will work in the same stove unit. The Jiko Tosha stove was born out of shortcomings identified in the stoves existing in the market. Its advantages are that it reduces indoor emissions, provides a safe and healthy environment to the consumer, accommodates more than one fuel source according to availability, and ensures that the users have access to economical and affordable cooking technology.

Savings per day or production:

Savings of about 70% of charcoal consumption per day for a normal family.

Cost in money and in own time to construct:

Costs KSh 5000 (About USD 50).

Lifetime:

About 5+ years.

Maintenance needed:

F&M Industries does not have local technicians throughout Kenya. If a part of the stove breaks or gets damaged, it can be shipped to the F & M manufacturing plant in Nairobi for repairs. To move the product from one place to the other, manufacturers use an existing local transport system. Replacements for all the components of the stove are available.

Resources needed in use:

Manufacturers specify that this four-in-one clean-energy stove was designed to use gas, charcoal briquettes, sawdust, or firewood as cooking fuels.

Problems and limits:

Safety concerns when using the product with biomass or charcoal as fuel are primarily related to harmful emissions of carbon dioxide, carbon monoxide, and sulfur dioxide, along with gas leakage during use with gas fuel. Another significant safety concern is domestic accidents such as accidental burning or spill-overs.

Where and how can you get it or make it?

The product is available at F & M industries along Lunga Lunga Rd, Industrial Area, Nairobi, Kenya. The users can purchase the product directly from the manufacturer and also buy online through the F & M industries website.

Skills needed to produce, install. maintenance, use:

The Jiko Tosha is manufactured in Kenya by a locally trained workforce. The manufacturing site consists of an assembly line and works on a batch production basis. Most of the parts are manufactured with power hand

tools, welding machines, and a semi-manual pressing machine, except for the outer casing and combustion chamber, which are manufactured using a sheet-metal-rolling machine. The use of the finished product requires a short introduction.

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How to maintain it:

To be added.

Climate effect (if any):

Testing carried out by the Kenya Industrial Research and Development Institute (KIRDI) on the stove CO2 and particulate emissions (g/MJ delivered to pot) determined that, while using LPG as fuel, the CO2 emissions were very low (0.38). When tested using charcoal, the stove emissions were average and fairly good (9.09) respectively. Source: https://www.engineeringforchange.org/solutions/product/jiko-tosha/

Why is it successful?

Its success lies in functioning as a four-in-one stove that can run on gas, charcoal briquettes, sawdust, or firewood, hence not limited to one particular fuel type. This product is known for bringing immense savings and higher efficiency.

If you can make it, a short description, typical problems, materials needed:

The Jiko Tosha is a multi-fuel cookstove that integrates traditional components of a rocket stove with single-burner gas-stove components. Rocket-stove design contributes an insulated combustion chamber, elevated steel grate, ash collector, and cast-iron pot support; gas stoves inspire the single-burner stove components such as an LP burner and LP regulator. The design also includes a stainless-steel adaptable fuel bed for briquettes and charcoal. Specifications; Height: 30 cm Outside diameter: 26 cm, Weight: 5.807 kg.

How to make it (if possible):

https://youtu.be/FKLnsrWguvI

How is it delivered and by whom?

The product can be obtained directly from the manufacturer (F&M Industries) and it can be delivered to customers through courier service provided by F&M Industries Ltd. Users can also obtain the product from local Cooperative societies (SACCOS), through which they can pay for the product in installments.

Successful financial model

Testing by organizations like Kenya Industrial Research and Development Institute (KIRDI), Training and monetary support by Kenya Climate Innovation Center.

What policies and strategies helped the success?

Complies with the following cookstove rating for the International Workshop Agreements as a streamlined process of the International Organization for Standardization (ISO):O. Emissions: LPG (Tier 5), Charcoal (Tier 2) PM Emissions: LPG (Tier 4), Charcoal (Tier 3) Thermal Efficiency: LPG (Tier 5), Charcoal (Tier 3).

More info:

Read more: https://www.fmindustries.co.ke/index.php/homeup . F&M Industries Ltd is developing a bigger version of the Jiko Tosha named Biko Tosha Max, the aim of the design is to be better suited for institutional use.

Sources:

F&M Industries Ltd. Lunga Lunga Rd, Godown No. 105, Narobi. http://jikotosha.co.ke/, Tel: + 254 720 338108.

Case uploaded:

2020-09-08

Takamoto Biogas






Why to choose this solution?

Provides reliable biogas energy to small-scale dairy farmers in Kenya. Also minimizes reliance on firewood. Cooking with this biogas is easier, clean, quick, efficient, and convenient.

Savings per day or production:

More trees are conserved, households spend less purchasing charcoal and LPG for their cooking needs, and less time is spent by women and children in collecting firewood.

Cost in money and in own time to construct:

A customer pays KSh 100,000 (USD 1,000.00) for one system, with an initial payment of KSh 15,000 (USD 150). The remainder, KSh 85,000 (USD 850), is then paid in installments of KSh3,000 per month with no interest or security required until one fully acquires the kit. System installation normally takes one to two days.

Lifetime:

Related appliances, such as kitchen gas burners, and desulphuriser, which remove bad odours, are replaceable every two years. There is also on-site training for the users on maintenance.

Maintenance needed:

Replacement of appliances such as kitchen gas burners, de-sulphurisers which remove bad odour. There is also an on-site training for the users on maintainance.

Resources needed in use:

A farmer or buyer only needs to have a sustainable source of dung and sufficient water in order to process biogas through the digester.

Problems and limits:

High initial installation cost of biogas deters many low-income earners. Poor quality of installations done in the past by other individuals and companies led to failed systems and gave the technology a bad name. Lack of awareness about the use and benefits of biogas technology and a shortage of trained installers have been other issues that Takamoto has faced.

Where and how can you get it or make it?

Available at the head office in Githunguri town in Kiambu County, and from their warehouse in Karatina, Nyeri County.

Skills needed to produce, install. maintenance, use:

Installation requires skilled technicians. There is on-site training on operation and maintenance. Internship programs where fresh graduates are trained and then attached to customers in specific areas over a three-month period are also provided.

How to use it:

https://youtu.be/8ZM0fiwu0Is

How to maintain it:

Not relevant.

Climate effect (if any):

More trees are conserved hence, deforestation is reduced. The system is also able to save about 4.5 tons of C02-equivalent methane emissions that would have been released to the atmosphere had the cow dung been left to decompose in the open.

Why is it successful?

The system is very economical and there is readily available feedstock. Cost-friendly installation and affordable labour. Successful partnership with the number of local Savings and Credit Cooperative Societies (SACCOs) and Micro-Finance Institutions (MFIs) has increased uptake through credit facilities.

If you can make it, a short description, typical problems, materials needed:

A typical system comprises one 12m3 Balloon-Bag Digester, one double-burner cooker, and sufficient piping for the entire system.

How to make it (if possible):

https://youtu.be/-MPR2_Mckr8

How is it delivered and by whom?

Takamoto biogas company has employed Kenyans as technicians and sales people, 25% of whom are female. Technicians help with installations and repairs. Takamoto currently focuses on the lease-to-own model, which is working well. To support sales, the company engages seven sales agents, each with a monthly target of six systems, which they sell on a commission basis. Once the sale is made, the customer is assigned a unique account number that enables Takamoto to track the operational and financial status of the installation. System costs can vary due to the associated additional transport, labour, and other site costs.

Successful financial model

There is an internship programme offering training whereby fresh graduates are trained, then attached to customers in specific areas over a three-month period, to work closely with the farmers and to support them in biogas system operations. All Takamoto records/transactions are maintained electronically. A customised online software application manages all customer data including financial transactions, repairs, and maintenance with ease, then sends automatic alerts to the office during various stages of installation.

What policies and strategies helped the success?

Successful partnership with Kenya Biogas Programme (KBP), which provides technical support to biogas entrepreneurs and offers them a marketing platform by creating awareness and linking them up with potential clients. Successful partnership with a number of local Savings and Credit Cooperative Societies (SACCOs) and Micro-Finance Institutions (MFIs) has increased uptake through credit facilities.

More info:

http://www.takamotobiogas.com/

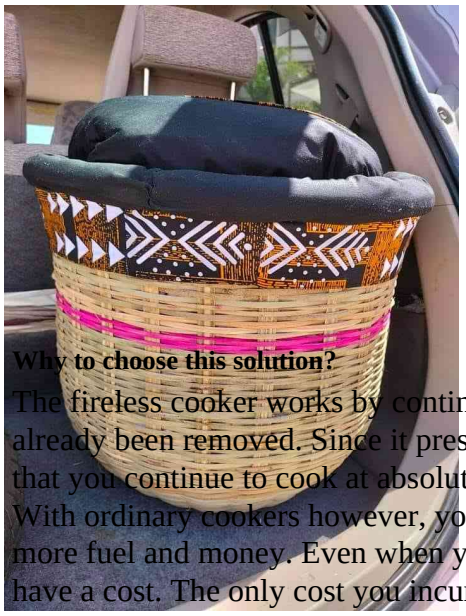
Sources:

Takamoto Biogas. Githunguri opposite Penko Petrol Station. Kenya. Tel: +254 738689788

Case uploaded:

2020-08-24

Fireless Cookers Food Warmers by Tangeni Crafts, Kenya





Why to choose this solution?

The fireless cooker works by continuing the process of cooking for a long time after the source of heat has already been removed. Since it preserves the heat and keeps it from getting lost in the environment, it means that you continue to cook at absolutely zero cost, while the heat is released very slowly as the food cooks. With ordinary cookers however, you still need the source of heat to continue the cooking, thereby expending more fuel and money. Even when you simmer the food on the stove, the lower amounts of heat released still have a cost. The only cost you incur with the fireless is the cost of purchasing it, which is very reasonable when compared to the years of use and hundreds of meals you will cook in it.

Savings per day or production:

It cuts down the cost of fuel consumption upto 50% depending on your volume of cooking. You redeem approximately 50% of your cooking time. Therefore you are able to focus on other chores or whatever needs your active attention. You are assured that your cooking is safe and healthy for your family. High nutrients reserved in slow heat cooking. It can be used for over 10 yrs. It does not a regular need fixing or replacement. Incase it does, we can still do the fixing.

Cost in money and in own time to construct:

It varies with size and the cost of the materials. The range is between Ksh. 1200 (12 USD) to Ksh. 5000 (50 USD). It takes between 2 to 3 hours making a single fireless cooker when all the materials are readily available.

Lifetime:

10 years on the minimum.

Maintenance needed:

It does not require much maintenance apart from light cleaning with a wet cloth and putting it on the sun to dry. (Note: only when it requires cleaning, e.g, if there is some spill in the fireless cooker.)

Resources needed in use:

None.

Problems and limits:

Financial constraints to those who know their advantage and would like to have one. Lack of appreciation and awareness from the community on the benefits of the fireless cookers.

Where and how can you get it or make it?

Available at Tangeni Crafts stores, also delivered countrywide on order

Skills needed to produce, install. maintenance, use:

Knitting, attention to detail.

How to use it:

How to maintain it:

Climate effect (if any):
It is 100% environmentally friendly since there are no emissions when using this technology.

Why is it successful?
Because they are made from readily available materials, they are affordable.

If you can make it, a short description, typical problems, materials needed:
Fireless cooker is an insulating basket made from locally available materials.

How to make it (if possible):

How is it delivered and by whom?
Deliverd countrywide by Tangeni Crafts.

Successful financial model

What policies and strategies helped the success?

More info:
https://web.facebook.com/search/top?q=tangeni%20crafts

Sources:
Betty Okello, Founder Tangeni Crafts. Email:betikwambs@yahoo.com Tel: 0708926643

Case uploaded:
2023-03-20

Efficient Electric Pressure Cookers (EPCs)







Why to choose this solution?

In Tanzania, TaTEDO in collaboration with SESCOM (which is a social enterprise) are participating in the Modern Energy Cooking Services (MECS) program, which is led by Lough borough University and financed by UK Aid. The implemented activities include awareness raising, importation of EPC and spare parts, marketing, research, advocacy and lobbying for conducive policies for EPC and other clean cooking solutions. Most of the people do not consider electricity as a cooking fuel, as they perceive it to be expensive. After discovering that cooking using electric pressure cooker is relatively cheaper than LPG, charcoal and a hot plate, the adoption rate increased sharply. The increased awareness and capacity-building have contributed to addressing the knowledge gap, which exists in Tanzania.

Savings per day or production:

The cost saving depends on the price of the electricity. In Tanzania, the EPC was approximately 7 times cheaper than kerosene, 10 times cheaper than LPG, and 13times cheaper than charcoal for boiling heavy foods, based on 2020 market prices of the electricity.

Cost in money and in own time to construct:

EPC costs about twice as much as an electric hotplate. Market prices in Tanzania range from Tsh 180,000 to 250,000 (USD 77 to 107) for quality EPCs with capacities of 4- to 6 liters, depending on the point along the market chain at which the appliance is bought by end-user.

Lifetime:

About five to six years.

Maintenance needed:

Requires replacement of rubber seal on the lid after being used for some time.

Resources needed in use:

Electricity from grid, mini-grid, and solar home systems can be used.

Problems and limits:

Use only one type of pot. Not suitable for some food like nyama choma, chapatti, and deep frying. Looks complicated at first.

Where and how can you get it or make it?

Most of them are imported from China, Japan, South Africa, Europe, etc., and distributed by various companies including SESCOM in Tanzania. To produce EPCs, you need investment to establish a factory.

Skills needed to produce, install. maintenance, use:

EPCs are manufactured in factories and special engineering knowledge is required. Training is required to be able to provide after-sale services. Simple training/introduction is required on how to use EPCs.

How to use it:

It is good for cooking many types of food, e.g., meat, potatoes, and beans. A cookbook and several short films are available published by TaTEDO.

How to maintain it:

Climate effect (if any):

Saves forests by providing an alternative clean cooking solution. Avoids emissions from combustion of biomass. Decrease CO2 emissions, when the electricity used is from renewable sources.

Why is it successful?

A pressure cooker cooks 2-6 times faster than regular cooking as the temperature will be higher under pressure. The water starts to boil on higher temperature when the pressure is higher. The cooker is insulated, which increase the efficiency. SESCOM which is a social enterprise involved in promoting, importing, and marketing of EPCs, along with TaTEDO, which focuses on support services, i.e., research, awareness-raising, capacity- building, market development, and lobbying for conducive environments for EPCs under the support of a MECS programme financed by DFID. Awareness and capacity-building have contributed a lot in addressing the knowledge gap which exists in Tanzania. Most of the people do not consider electricity as a cooking fuel, as they perceive it to be expensive. After discovering that the use of EPCs is the cheapest way of cooking, the adoption rate has increased sharply.

If you can make it, a short description, typical problems, materials needed:

N/A

How to make it (if possible):

N/A

How is it delivered and by whom?

Main actors in the supply chain of EPCs include importer, distributors, retailers, and end-users. SESCOM imports EPCs directly from manufacturers and takes them to agents (distributors) and end- users. Some of the consumers of SESCOM EPCs are mini-grid developers who intended to introduce efficient electric appliances to the mini-grid customers.

Successful financial model

EPCs are delivered with a pay-as-you-go financing model to the mini-grid customers, whereas customers who cannot pay the whole price at once are linked to micro-financing institutions, which arrange for them to make payments on an installment basis.

What policies and strategies helped the success?

The National Energy Policy (2015) promotes energy efficiency and alternative energy (use of biomass for cooking). Micro finance Policy (2017) creates an enabling environment for an efficient and effective microfinance sub-sector in the country that serves the needs of low-income individuals, households, and enterprises. Other supportive strategies and regulatory frameworks include SE4ALL Action Agenda (2015), Electricity Act of 2008, Rural Energy Act of 2005, and Environmental Management Act 2004.

More info:

https://data.verasol.org/products/epc/sescom9?viewall=true ,
https://sescom.co.tz/news/24-tatedo-win-1st-for-the-2020-electric-pressure-cooker-competition and
https://tatedo.or.tz/attachments/article/43/Ecook%20Book%20(english).pdf

Sources:

TaTEDO, MbeziJuu, Mpakani Road Goba House No GOB/KZD/883, P. O. Box 32794, Dar es Salaam, Tanzania. Web: www.tatedo.or.tz Tel: +255 738-201498, E-mail: energy@tatedo.or.tz

Case uploaded:
2020-09-27

Fireless Basket Cooker / Flask (Hay Box)





Why to choose this solution?

It completes the cooking of food that has been partially cooked, and it acts as a food flask because it can keep food hot for more than 5 hours. It can be used to maintain the temperature of cold drinks. As such, it saves energy and time. The fireless basket cooker can be used to prepare beans, peas, groundnut sauce, beef, chicken, rice, matooke, Irish potatoes, sweet potatoes and cassava. Additionally, the basket can keep all types of food warm for a maximum of 8 hours.

Savings per day or production:

The warmth of the food can be retained by placing the cooking pot in the fireless basket cooker for as long as possible until your food is ready to be served. The basket can retain heat for a maximum of 8 hours.

Cost in money and in own time to construct:

The Hay Basket costs USh 35,000 - 55,000 (USD equivalent 9.5-15) and making a Hay Basket takes about 4 hours.

Lifetime:

3-7 years, depending on how it is handled.

Maintenance needed:

Washing of the cloth.

Resources needed in use:

No resources needed.

Problems and limits:

It can fail to perform cooking task if it is not well constructed. This can happen if the person who makes it, does not follow the instruction precisely.

Where and how can you get it or make it?

Use trained people to make it. You can also buy already made from established selling points, or make order at JEEP Folkecenter.

Skills needed to produce, install. maintenance, use:

Production needs a trained person.

How to use it:

The food needs to be half cooked on a stove and then it should be placed into the basket to get the boiling completed. Cooking time depends on the type of food. For example, rice should be boiled for 5 minutes on the stove and it will take 30 minutes to get ready in the basket. Beans and beef will take longer cooking time in the basket.

How to maintain it:

Not relevant.

Climate effect (if any):

It is 100% environmentally friendly since there are no emissions when using this technology.

Why is it successful?

It is easy and cheap to make and it is made using locally available materials.

If you can make it, a short description, typical problems, materials needed:

Cotton, basket, container e.g a sausepan, polythene, cotton cloth, thread and needle.

How to make it (if possible):

Not relevant.

How is it delivered and by whom?

It can be accessed from trained people who make it. You can also buy already made from established selling points or place an order at JEEP.

Successful financial model

Support for development, training, establishment of unions of makers, constructors.

What policies and strategies helped the success?

Funding from development partners and JEEP friends.

More info:

JEEP, 7 miles, Gayaza Rd, Kyanja, Kampala, P.O. Box 4264, Uganda, phone: 256 414 578 316. Email: info@jeepfolkecenter.org

Sources:

https://jeepfolkecenter.org/

Case uploaded:

2020-09-29

Fireless cookers / food warmers







Why to choose this solution?

The fireless cooker is an insulated basket made from locally available materials. It works by continuing the process of cooking for a long time after the source of heat has been removed. Since it preserves the heat, you continue to cook at no cost, while the heat is released slowly as the food cooks. With ordinary cookers, however, you still need the source of heat to continue the cooking, thereby using more fuel and money. If you already have a fire in the stove, you still can reduce fuel as you can prepare another dish on it, while the first dish is cooking further in the basket or bag. The cooked food is healthy as high levels of nutrients is kept during slow heat cooking.

Savings per day or production:

It cuts down the cost of fuel consumption up to 50% depending on your volume of cooking. You redeem approximately 50% of your cooking time. Therefore you are able to focus on other chores or whatever needs your active attention. You are assured that your cooking is safe and healthy for your family. High nutrients reserved in slow heat cooking. It can be used for over 10 yrs. It does not need a regular need fixing or replacement. In case it does, we can still do the fixing.

Cost in money and in own time to construct:

The costs varies with size and the cost of the materials. The basket cooker costs KSh 1400-4000 (USD 24-40) from size mini to extra large. The bag costs KSh 500-900 (USD 5-9). It takes 2- 3 hours to make it, when all the materials are readily available.

Lifetime:

5-10 years.

Maintenance needed:

It does not require much maintenance apart from light cleaning with a wet cloth and putting it on the sun to dry. (Note: only when it requires cleaning, e.g, if there are some spill in the fireless cooker.)

Resources needed in use:

None.

Problems and limits:

You start to prepare the food earlier, because it takes longer time. As an example the boiling time for rice is 5 minutes with 30-45 minutes in the bag/basket afterwards. It is also suggested to pre-soak specific types of food such as beans.

Where and how can you get it or make it?

They are used in Kenya in various parts of the country. The basket and the bag are both available at Tangeni Crafts stores, and are also delivered countrywide on order. The basket cooker is available in 6 sizes on order from Motozero. You can make it yourself.

Skills needed to produce, install. maintenance, use:

To produce, needed clothes and insulation material e.g. small pieces of clothes, or polystyrene pellets. You need to have sewing skills, and attention to detail. The fireless basket model, need a basket. To make a basket, you need weaving skills.

How to use it:

How to maintain it:

Climate effect (if any):

It is climate friendly technology. A food warmer used by a family in a year are: savings upto 0.5-1 tons of carbon emissions, upto 1000 liter water and reduction of indoor pollution upto 60%.

Why is it successful?

It is affordable for most people, and saves money. It is cheap, and have a nice colourful look. People can also make them themselves from local materials. There are cook books available, and a community to share knowledge.

If you can make it, a short description, typical problems, materials needed:

Fireless cooker is an insulating basket made from locally available materials.

How to make it (if possible):

How is it delivered and by whom?

Successful financial model

What policies and strategies helped the success?

More info:

Tangeni Crafts, Kenya: https://www.facebook.com/tangenicrafts/ Tel. +254 708 926643 Motozero, Kenya: https://www.motozero.co.ke/ Tel: +254 796 804 864

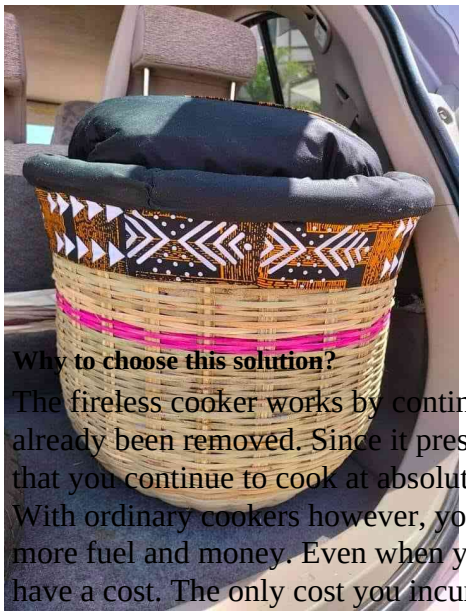
Sources:

Betty Okello, Founder Tangeni Crafts. Email:betikwambs@yahoo.com Tel:0708926643

Case uploaded:

2023-03-20

Fireless cookers / food warmers by Tangeni Crafts







Why to choose this solution?

The fireless cooker works by continuing the process of cooking for a long time after the source of heat has already been removed. Since it preserves the heat and keeps it from getting lost in the environment, it means that you continue to cook at absolutely zero cost, while the heat is released very slowly as the food cooks. With ordinary cookers however, you still need the source of heat to continue the cooking, thereby expending more fuel and money. Even when you simmer the food on the stove, the lower amounts of heat released still have a cost. The only cost you incur with the fireless is the cost of purchasing it, which is very reasonable when compared to the years of use and hundreds of meals you will cook in it.

Savings per day or production:

It cuts down the cost of fuel consumption upto 50% depending on your volume of cooking. You redeem approximately 50% of your cooking time. Therefore you are able to focus on other chores or whatever needs your active attention. You are assured that your cooking is safe and healthy for your family. High nutrients reserved in slow heat cooking. It can be used for over 10 yrs. It does not a regular need fixing or replacement. Incase it does, we can still do the fixing.

Cost in money and in own time to construct:

It varies with size and the cost of the materials. The range is between Ksh. 2000 (20 USD) to Ksh. 10000 (100 USD). It takes between 2 to 3 hours making a single fireless cooker when all the materials are readily available.

Lifetime:

10 years on the minimum.

Maintenance needed:

It does not require much maintenance apart from light cleaning with a wet cloth and putting it on the sun to dry. Note: only when it requires cleaning, e.g, if there are some spill in the fireless cooker.

Resources needed in use:

None.

Problems and limits:

Financial constraints to those who know their advantage and would like to have one. Lack of appreciation and awareness from the community on the benefits of the fireless cookers.

Where and how can you get it or make it?

Available at Tangeni Crafts stores, also delivered countrywide on order.

Skills needed to produce, install. maintenance, use:

Knitting, attention to detail.

How to use it:

How to maintain it:

Climate effect (if any):
It is 100% environmentally friendly since there are no emissions when using this technology.

Why is it successful?
Because they are made from readily available materials, they are affordable.

If you can make it, a short description, typical problems, materials needed:
Fireless cooker is an insulating basket made from locally available materials.

How to make it (if possible):

How is it delivered and by whom?
Deliverd countrywide by Tangeni Crafts in Kenya.

Successful financial model

What policies and strategies helped the success?

More info:
https://web.facebook.com/search/top?q=tangeni%20crafts

Sources:
Betty Okello, Founder Tangeni Crafts. Email:betikwambs@yahoo.com Tel: 0708926643.

Case uploaded:
2023-03-20

Haines-Copenhagen Solar Cookers





Why to choose this solution?

Solar cooking is the second-most preferred method of cooking at the Kakuma Refugee Camp, the Haines-Copenhagen solar cookers provide a reliable, inexpensive and durable cooking technology thereby reducing overreliance on firewood and charcoal.

Savings per day or production:

Savings on wood fuel and charcoal.

Cost in money and in own time to construct:

Costs KSh 2500 (USD 25).

Lifetime:

3-5 years with proper care.

Maintenance needed:

Wiping of the reflective material.

Resources needed in use:

Requires sunlight and cooking pots to use.

Problems and limits:

It cannot be used all the time especially at night and during rainy seasons. It is slow in cooking.

Where and how can you get it or make it?

It is available in Kakuma Refugee Camp, Kenya. There are other models like Haines 2.0.

Skills needed to produce, install. maintenance, use:

The cookers come with simple assembly instructions. They have color-coded snaps for quick assembly and instructions on how to use them.

How to use it:

Kakuma refugee camp video: https://youtu.be/rnrIPdtuDsQ (not perfect film, just for illustration).

How to maintain it:

Not relevant.

Climate effect (if any):

Solar cookers produce no smoke, no carbon emission, and reduce deforestation in the region.

Why is it successful?

The solar cooker is low cost, lightweight, compact, easy to assembly, folds easily for storage, and durable so it can be used many years.

If you can make it, a short description, typical problems, materials needed:

The cookers uses the same reflective material as the regular Haines Solar Cooker, specifically, a Rogers metalized polyethylene terephthalate (MPET) foam reflector, and a cooking sleeve without the polycarbonate cover.

How to make it (if possible):

https://youtu.be/G18omu6kRis

How is it delivered and by whom?

The cookers are made in Kakuma by refugees from materials donated by Haines Solar Cookers. Fifty refugee women were trained to make the cookers, and they in turn trained the children during the solar cooking festival in which 500 schoolchildren participated.

Successful financial model

Support and training from partners like Haines Solar Cookers, Eco-mandate Foundation; Natural Resource and Waste Management Alliance. Solar- cooking festival increasing the uptake of solar cookers. In 2017, fifty refugee women were trained to make the cookers, and they in turn trained 500 school children during the Solar Cooker Festival at the Kakuma Refugee Camp. The high demand for solar cookers led to inception of a social enterprise.

What policies and strategies helped the success?

Successful partnerships between Haines solar cookers and Copenhagen solar cookers; solar-cooking festival for 500 schoolchildren, which increased the uptake of solar cookers.

More info:

https://www.hainessolarcookers.com/, https://youtu.be/G18omu6kRis, https://youtu.be/rnrIPdtuDsQ, https://www.facebook.com/ecomandate/, https://www.she-inc.org/?p=2538.

Sources:

Case uploaded:

2020-08-27

Parabolic Reflector Solar Cookers





Why to choose this solution?

Parabolic reflectors are among the most powerful solar cookers. They can be used for frying and fast cooking, and they complement other types of solar cookers that more suited for slow cooking. Like all solar cookers, there are no fuel costs or emissions from using it, and there are economic, health and environmental advantages particularly beneficial for women.

Savings per day or production:

Savings on wood fuel and charcoal.

Cost in money and in own time to construct:

It costs USh 700,000, (USD 195). No fuel cost.

Lifetime:

10-15 years with proper care.

Maintenance needed:

Wiping of the reflective material.

Resources needed in use:

Requires sunlight and cooking pots to use.

Problems and limits:

When there is no sun, it is intended to be integrated with cooking solutions that can work at night or during rains. It is generally more expensive than panel and box cookers, and requires more storage space.

Where and how can you get it or make it?

Available in stores in various villages. Solar Connect Association, Renewable Energy Centre, Bihaarwe, Masaka, Mbarara Road, Opposite Igongo Hotel, Mbarara, Uganda. T: +256 772 665 894, E: scacooking23@gmail.com

Skills needed to produce, install. maintenance, use:

How to use it:

The cookers come with assembly instructions. Training on how to use them is recommended. Proper safety such as sun glasses/sun protection and hot pads are recommended. Set matte-black cookware on pot stand. Point the cooker to the sun to collect and concentrate sunlight onto the cook pot. When cooking longer period, the cookers needs to be periodically reorientated towards the sun.

How to maintain it:

Climate effect (if any):

Solar cookers produce no polluting gas and carbon emission, and there is reduced deforestation in the region.

Why is it successful?

The cooking time is fast, like traditional stovetops. High temperatures (120â€“230 Â°C) allow for food to be fried, grilled, and boiled. There is no need of collecting or buying fuelwood. With its safe design, the cooker can be used over many years. The cost is low compared to the expense one would otherwise spend on firewood and/or charcoal as cooking fuel over time.

If you can make it, a short description, typical problems, materials needed:

How to make it (if possible):

How is it delivered and by whom?

Successful financial model

Several organisations have provided seed funding for Solar Connect Association (SCA) to promote, produce and market different types of solar cookers since 1994, which resulted to a market expansion. SCA produces different models of solar cookers, but the parabolic cooker is traded from China. SCAâ€™s fulltime employees are mostly women and include village women marketers who are trusted in their communities. They raise awareness through demonstrations and help SCA to generate revenue from sales that covers all expenses, which is reinvested to grow the business.

What policies and strategies helped the success?

More info:

https://solarcooking.fandom.com/wiki/Category:Parabolic_solar_cooker_designs, https://solarcooking.fandom.com/wiki/Solar_Connect_Association

Sources:

Solar Connect Association, Renewable Energy Centre, Bihaarwe, Masaka, Mbarara Road, Opposite Igongo Hotel, Mbarara, Uganda. T: +256 772 665 894, E-mail: scacooking23@gmail.com

Case uploaded:

2022-01-24

Solar Box Cooker





Why to choose this solution?

Solar cookers are an easy way to use less firewood and save money. Depending on the needs of the user one can also use this solution for drying and preserving farm produce.

Savings per day or production:

This solution saves the use of bio fuels and biomass for cooking up to 95% because it requires no fuels for heat generation.

Cost in money and in own time to construct:

The solar box costs between UGX 300,000 (boxed cooker) - 1,000,000 (more complex designs) approximately USD 82.19 - 277. It can also be constructed using local materials and a person can construct one for home use.

Lifetime:

The duration for this solution is around 10-30 years.

Maintenance needed:

Regulary clean the interior of the box after use.

Resources needed in use:

Good sunny weather, Knowledge of solar cooking, materials and market.

Problems and limits:

Requires Good Sunny Weather and knowledge on how to use the solar cooker. Cannot fry foods. In cultures and societies where frying is common, take up of solar cookers will be less as the cheaper models cannot fry foods.

Where and how can you get it or make it?

The solar box are sold at JEEP offices in Kyanja and online shopping platforms.

Skills needed to produce, install. maintenance, use:

Production requires technical training. There are no specific skills required to maintain or install the solar box; all you need is to be careful while handling it and always keep it clean. Using a black pot increases the efficiency.

How to use it:

How to maintain it:

Needs to be cleaned after cooking.

Climate effect (if any):

Solar box cookers produce no smoke and no pollution, hence reducing green house gas emissions by 90%.

Solar cookers lessen the demand for firewood, saving up to 1 ton of wood per year for each solar cooker.

Why is it successful?

JEEP promotes uses of renewable energy for cooking. It has promoted this solution and marketed it all over the country. JEEP carries out training, also encouraging youth to be creative and to start producing these boxes to earn some income, to make the solution cheaper, and to make it available to all kinds of people.

If you can make it, a short description, typical problems, materials needed:

It needs a skilled person to construct the product. To make this solar box, you need a box made out of an insulator, a glass pane or a transparent polycarbonate sheet. One needs to insulate the box more by adding a layer of insulating material plus a black cloth to cover the layer. The cover of the box should be made of a transparent material that can allow in sunlight and cover the box allowing very little or no air to enter the box while closed.

How to make it (if possible):

Not relevant.

How is it delivered and by whom?

It can be found/picked up at JEEP head office in Kyanja.

Successful financial model

Support from development partners.

What policies and strategies helped the success?

Support from development partners and government policies of waiving taxes on solar products.

More info:

http://solarcooking.wikia.com/wiki/Introduction_to_solar_cooking

Sources:

JEEP, 7 Miles, Gayaza Rd, Kyanja, Kampala, P. O. Box 4264, Uganda. Phone: +256 414 578 316. Email: info@jeepfolkecenter.org. https://jeepfolkecenter.org/

Case uploaded:

2021-03-16

Solar Box Oven (ULOG)





Why to choose this solution?

On sunny days, a solar box cooker reduces the use of firewood and the time collecting firewood, as well as saves money to buy firewood or charcoal. There is no smoke. The box cooker is an insulated box, with a reflector using the greenhouse principle. You can cook in multiple pots, and no need of steering the food. The ULOG solar ovens can be bought or made from local materials, according to a manual.

Savings per day or production:

The solar box cooker saves the use of fuel wood or charcoal on sunny days.

Cost in money and in own time to construct:

It costs as low as USD 60 to contruct depending on materials used. They can also be built by yourself according to instruction in a couple of days. There is a Do-It-Yourself manual, which is open source. The cooker consists of an insulated box with a transparent top allowing light in, and reflectors to collect more light into the box.

Lifetime:

Around 10-15 years.

Maintenance needed:

Regularly clean the reflectors, window, and interior of the box after use.

Resources needed in use:

No need of fuel.

Problems and limits:

It is not ideal to prepare meat and frying since it does not reach high temperatures enough. You cannot cook in cloudy and rainy days. Cooking takes longer time than cooking on fire.

Where and how can you get it or make it?

Skills needed to produce, install. maintenance, use:

How to use it:

Place black pots of food in the oven, close the oven and align the oven with the direction to the sun (shadow behind the cooker). Cooking usually take 1-3 hours. Optimizing it, turn the cooker to follow the sun every 20-60 minutes. It cooks well rice, stews, eggs, vegetables and East African foods as ugali, githeri, sukuma wiki.

How to maintain it:

Climate effect (if any):

Using solar cookers ovens on sunny days lessen the demand for firewood or charcoal, thus reduce CO2 emissions from cooking, and reduce deforestation.

Why is it successful?

It is a strong box, which manages well for long time.

If you can make it, a short description, typical problems, materials needed:

You can build it from local material such as Wood plate, glass, reflecting material (aluminium folie).

How to make it (if possible):

You can build it yourself. Do it Yourself Manual is available. See at the more info underneath.

How is it delivered and by whom?

You can buy it or you can build it yourself.

Successful financial model

You can buy it or you can build it yourself. Local production ensures good quality, keeps costs lower and supports the local economy. Ecomandate produces it in Kenya, by Kenyans, using materials available in Kenya, and for use in Kenya. The double sized model (see photo) is also produced and used in Kakuma refugee camp since 2018. This approach of local production building solar cooking capacity in Kenya is leading to increased accessibility and affordability of solar box ovens in Kenya.

What policies and strategies helped the success?

Advocating partners for solar cooking like Solar Cookers International are urging national governments to prioritize solar cooking in their national policies and in refugee camps.

More info:

https://ecomandate.com/ , https://solarcooking.fandom.com/wiki/ULOG_1.0 , https://solarcooking.fandom.com/wiki/Category:Solar_box_cooker_designs . DIY Manual: http://www.med.uni-magdeburg.de/~maercker/SolCook/slcot-en.html

Sources:

Solar Cookers International (SCI), Ecomandate Foundation, Mbagathi Road, Nairobi, Kenya. T: +254 729 001702, ecomandatefoundation@gmail.com

Case uploaded:

2021-03-15

Solar Cooker Cookit





Why to choose this solution?

This solar cooker is made of durable cardboard and foil shaped to reflect maximum sunlight onto an enclosed cooking pot. It is easy and simple to use. It is an affordable, effective, and convenient solar cooker. With a few hours of sunshine, the CooKit makes tasty meals for five to six people at gentle temperatures, cooking food and preserving nutrients without burning or drying out. The solar cooking process is smokeless, reducing pollution, respiratory diseases, and eye irritation.

Savings per day or production:

CooKit saves more than four times its value in fuelwood each year. With careful use and storage, a CooKit can be used for two years, reducing fuelwood consumption by two tonnes. Reduces pressure on forests for firewood and charcoal.

Cost in money and in own time to construct:

CooKits are produced from a wide variety of materials at a cost of KSh 300-700 (USD 3.00- 7.00).

Lifetime:

With careful use and storage, a CooKit can be used for two years.

Maintenance needed:

Storing the CooKit in a safe place away from moisture and animals, preferably indoors. Allowing plastic bags to air-dry or gently wipe dry with a towel. The CooKit is compact and portable. When not in use, it can be simply folded lengthwise into thirds or folded flat into a 33 cm (13 in) square.

Resources needed in use:

Sunlight, a cooking pot and lid, plastic bags or pyrex bowls as a greenhouse.

Problems and limits:

Can be blown away on a windy day but added weights e.g., stones can easily hold the cooker in place (as pictured above).

Where and how can you get it or make it?

Originally designed by Solar Cookers International (SCI), people can make CooKits using open source design plans. You can also buy CooKits from NGOs using them in your own country. In Kenya, CooKits are used in Lower Nyakach, and are available from the organization â€œFriends of The Oldâ€•.

Skills needed to produce, install. maintenance, use:

Brief training on how to construct and use the CooKit require only a short introduction.

How to use it:

To be added.

How to maintain it:

To be added.

Climate effect (if any):

CooKit can be used for two years, reducing fuelwood consumption by two tonnes. It reduces pressure on forests for firewood and charcoal, hence helps to reduce climate change.

Why is it successful?

It is successful because the card stock and reflective material are available locally (sometimes as recycled material such as the inside of snack bags for the reflective material). It is easy to make and use, the fuel (sunlight) is free of charge and abundant, and it is portable. The CooKit Solar Cooker was launched in 2005 in several refugee camps in Chad, which made it well known. Using the Cookits resulted with that women and children no longer had to leave the camp to get firewood, and were not exposed to risking being raped, harassed and murdered. It also reduced the use of fuel wood in the dry region, and the time women spent on cooking on open fires.

If you can make it, a short description, typical problems, materials needed:

Cardboard (3x4 feet or 1x1.3 meters); aluminum foil; white glue; water. There is a handbook published by Solar Cookers International that includes detailed plans for building a CooKit.

How to make it (if possible):

https://youtu.be/yykfL6pYbBQ

How is it delivered and by whom?

Local entrepreneurial groups can easily use open- source design plans to launch CooKit production, sales, and distribution. For instance, CooKits have been distributed directly to beneficiaries (such as elderly community members) by community-based organizations. Complementary technologies, such as a Water Pasteurization Indicator (WAPI) and an insulated basket (fireless cooker) may be bundled with a CooKit and cookware.

Successful financial model

Because the CooKit is so affordable and easy to make, families can make one and start experiencing savings in fuel costs right away. These savings could even then be used towards purchasing other models of solar cookers.

What policies and strategies helped the success?

Localleaders (especially women) leading byexample and demonstrating use with local foods in the local language. Training and follow up and community support/involvement (many women in a community having access to solar cooking). Women taking pride and ownership in the CooKits, for example, by adding a fabric liner around the edges to make it sturdier and more visually appealing.

More info:

Solar Cookers International (SCI), https://solarcooking.fandom.com/wiki/CooKit, List of NGOs where you can buy it: https://solarcooking.fandom.com/wiki/CooKit#NGOs. Handbook â€œHow to Make, Use and Enjoyâ€•:
https://www.solarcookers.org/files/7914/5687/8521/How_to_make_use_understand_English_Update.pdf and Cookbooks available from https://www.solarcookers.org/resources/download

Sources:

Case uploaded:

2020-09-29

Charcoal Briquettes (Hand made)





Why to choose this solution?

Briquettes, as fuel, are virtually smokeless and slow-burning. They are easy to store and to transport. They burn three times longer than charcoal. Their use poses a lower risk to the respiratory health of users. Briquettes heat up evenly and remain at a constant temperature for a long time. They are more efficient fuel than either wood or charcoal, so their use reduces the cutting of trees for firewood, hence helping to conserve the environment.

Savings per day or production:

Briquettes are made from 100% organic waste and residues. They are designed to be long burning (up to four hours), reducing cooking costs by 20% to 40%. It is estimated that 0.8 kg of briquettes is equivalent to one kilogram of traditional charcoal of average quality.

Cost in money and in own time to construct:

A kilogram of charcoal briquettes costs between USh 1000 - 1,500, or approximately USD 0.28 - 0.41. It takes a minimum of two hours to make.

Lifetime:

They last three times more than charcoal when burning. It can last for more than 5 years if stored in a cool dry place.

Maintenance needed:

Not applicable.

Resources needed in use:

Energy saving stove and cooking utensils.

Problems and limits:

Briquettes are not water resistant.

Where and how can you get it or make it?

The briquettes are sold at JEEP, supermarkets and through most of the environmental CBOs operating in Uganda.

Skills needed to produce, install. maintenance, use:

Training is required to make them.

How to use it:

Not relevant.

How to maintain it:

Not relevant.

Climate effect (if any):

Using briquettes as an alternative energy source reduces the fuelwood-cutting that contributes to deforestation. This allows trees to remain standing as carbon sinks, which helps to slow climate change.

Why is it successful?

This solution has been successful because it is affordable; it lasts longer than charcoal; it is smokeless, efficient, and environment friendly. Support comes from development partners and from the government of Uganda.

If you can make it, a short description, typical problems, materials needed:

Raw materials needed or used may include charcoal dust, dry food-peelings, ash, water, cassava flour, clay, and/or molasses.

How to make it (if possible):

Not relevant.

How is it delivered and by whom?

It can be picked up from the JEEP head office in Kyanja.

Successful financial model

The materials used are cheap and readily available in our communities.

What policies and strategies helped the success?

There is support coming from development partners and from the government.

More info:

JEEP- Joint Energy and Environment Project, 7 Miles, Gayaza Rd, Kyanja, Kampala, P. O. Box 4264, Uganda. +256 414 578 316. Email: info@jeepfolkecenter.org

Sources:

https://jeepfolkecenter.org/

Case uploaded:

2021-03-15

Improved Basic Earth-Mound Kiln (IBEK)





Why to choose this solution?

The Earth Mound Kiln (EMK) is one of the oldest and most commonly used kilns in East Africa. EMK has average efficiency of 8-15%. Carbonization time is 8 days, during which the kiln requires continuous attention, and cooling time is 24-48 hour on average. The quality of charcoal produced is rather low. The Improved Basic Earth Mound Kiln (IBEK) has efficiency of more than 25%, carbonization takes only 4 days, cooling takes 24 hours, and the quality of charcoal produced is relatively high.

Savings per day or production:

IBEK has an efficiency of about 20-25%. It requires half the time required by the traditional BEK to produce charcoal. IBEK yields large pieces of charcoal with no leftovers, requires only 4.5 kg of wood per 1 kg of charcoal, and raises the calorific value of produced fuel to more than 31kJ/kg. For traditional EMK, in contrast, 7kg of wood are required to produce 1kg of low-quality charcoal of calorific value of 26kJ/kg.

Cost in money and in own time to construct:

IBEK is a temporary structure; the size of the kiln varies from a few cubic metersâ€™ capacity to over 100 cubic meters. One iron sheet to make the chimney is required, the price ranges from TSh 15,000 to 18,000 (USD 6.50 to 7.75). Another cost in time, effort, is labour, to construct, to load, to monitor, and to clear away the kiln. Given the reductions in number of days required for carbonization and in the amount of wood needed, the IBEK is a vast improvement over the traditional BEK in terms of labour costs.

Lifetime:

Carbonization takes four days and cooling takes 24 hours, then off-loading follows.

Maintenance needed:

During carbonization, one must monitor the process every two to three hours to ensure that the kiln is well covered throughout and that no air is getting into the kiln through its walls. Soil is used to cover any emerging openings in the structure of the kiln.

Resources needed in use:

One corrugated-iron sheet is needed to make a chimney. Wood, grasses, and soil, all locally available, complete the building materials. The IBEK requires little capital investment once one possesses the necessary common hand tools (axes, machetes, hoes, rakes, shovels, digging forks), which are usually already at hand from other daily industrial and agricultural activities of the rural population. Labour is required to form the chimney, to construct the kiln, to shepherd the process, and to unload the kiln.

Problems and limits:

More time is consumed while preparing and organizing wood in the kiln to minimize void space. A large amount of small pieces of wood is required to make the apron. More grasses are required, as the more efficient design requires the entire piles of wood to be covered completely.

Where and how can you get it or make it?

The IBEK design is applied in Tanzaniaâ€™s coastal and southern areas, but mainly is used in Kilosa in the Morogoro region.

Skills needed to produce, install. maintenance, use:

Arrangement of logs, chimney placement, and kiln covering requires a trained person. Monitoring of the carbonization process and charcoal off-loading need a short introduction only.

How to use it:

How to maintain it:

Climate effect (if any):

Each ton of charcoal produced and consumed in Tanzania using traditional methods generates nine tons of CO2 emissions; IBEK reduces emissions considerably. The IBEK is designed such that the chimney plays an important role in reducing air pollution by serving as a smoke filter. It works well, reducing the emission of harmful volatile substances into the atmosphere by as much as 75%.

Why is it successful?

IBEK uses a relatively smaller quantity of wood, and less carbonization time (hence, less monitoring time) to produce charcoal in the same quantity as the traditional method. Moreover, the IBEK yields large pieces of charcoal with no leftovers.

If you can make it, a short description, typical problems, materials needed:

Wood is needed to make charcoal. A metal sheet and minimal metal-working skills are required to make the chimney. A large amount of earth and grass is needed to achieve full coverage of the other material input, wood.

How to make it (if possible):

Video is being prepared to be uploaded later.

How is it delivered and by whom?

The IBEK has been incorporated into a sustainable charcoal-production model, which involves development of a village land-use plan with land demarcation for each villageâ€™s forest reserve. The village prepares a forest-management plan and by-laws for managing the village forest reserve. The forest-management plan designates areas for sustainable charcoal production equal to 10% of the villageâ€™s total forest land. A Village Natural Resource Committee (VNRC) is established to oversee and to manage the village forest land. One of the tasks of the VNRC is to approve requests from charcoal producers and to ensure that they follow sustainable charcoal production methods, including use of IBEKs rather than traditional BEKs.

Successful financial model

This model facilitates transformation of forest that, earlier, was regarded as general land, into village land. Thus, the model gives villagers the right to own, and to benefit from fees and royalties from, forest adjacent to them. Money previously collected by the central government remains in the village. The decision on how the revenue accrued will be used is made by the village assembly. In most cases, villagers use the money for community-development projects and for forest management costs, such as patrols.

What policies and strategies helped the success?

The Tanzania National Forest Policy advocates for Community Based Forest Management and benefit-sharing. Charcoal regulations and village by-laws support these improvements.

More info:

www.tatedo.or.tz

Sources:

TaTEDO, Mbezi Juu, Mpakani Road, Goba, House No GOB/KZD/883, P. O. Box 32794, Dar es Salaam, Tanzania. Tel: +255 738-201498, E-mail: energy@tatedo.or.tz

Case uploaded:

2020-09-04

Portable Metal Kiln







Why to choose this solution?

These portable metal kilns (PMKs) operate on the principle of reverse draught: carbonisation starts from the top and moves downwards, aided by chimneys situated around the base of the kiln. They provide better control and a greater average yield (about 30%) of charcoal with shorter production cycles (16-24 hours) than traditional earth kilns.

Savings per day or production:

Saves on kilograms of wood used to produce charcoal (the kiln will reduce wastage of wood), as it produces more kg of charcoal (250 kg) for every 1000 kg of wood used. The traditional earth kiln only produces 120-180 kg of charcoal from the same amount of wood.

Cost in money and in own time to construct:

Not specified.

Lifetime:

2-3 years.

Maintenance needed:

Not specified.

Resources needed in use:

The kiln requires dried tree branches systematically arranged vertically inside the drum. The fire is lit from the top once the drum is full.

Problems and limits:

PMKs have a higher capital cost compared with an equal production capacity of either improved basic earth-mound kilns or masonry kilns; they are limited in production capacity (about 3-4 bags); and biomass must be cut and/ split to fit into the kiln. Putting the lid on a flaming drum can also be dicey.

Where and how can you get it or make it?

These kilns are available at Kenya Forestry Research Institute (KEFRI). They are made from ordinary oil drums, modified by welding on short metal pipes that act as chimneys.

Skills needed to produce, install. maintenance, use:

Skills needed to produce and maintain the metal kilns are welding and metal crafts training. The charcoal producers are trained on how to use this technology. An easy-to-use training manual is also available at KEFRI to guide the users.

How to use it:

To be added.

How to maintain it:

To be added.

Climate effect (if any):

The kiln uses tree branches and thus there is less need to cut down trees. This technology therefore reduces some of the deforestation that contributes to climate change.

Why is it successful?

It succeeds because PMKs are easily moved to sites near the required raw materials. Further, the production cycle is short (16-24 hours), they are sturdy and thus last for two to three years, and being weather-resistant, they can be operated throughout the wet season.

If you can make it, a short description, typical problems, materials needed:

The kilns are made of 2-mm-thick stainless or mild steel, consisting of three interlocking cylindrical sectors and a conical cover. The bottom cylinder has eight air inlet/outlet channels arranged radially at the base, chimneys are situated around the base of the kiln.

How to make it (if possible):

To be added.

How is it delivered and by whom?

The PMK is produced by skilled metal craftsmen. Charcoal producers in charcoal-producing counties (men and women) are trained to produce charcoal with this technology, and such training propagates further through the Charcoal Producer Association (CPA). Main actors include charcoal producers and KEFRI as well as charcoal research and development organisations.

Successful financial model

Training charcoal producers and supporting the development of a charcoal framework could be developed further by the Government into a full- fledged Nationally Appropriate Mitigation Action priority. Successful partnerships support the technology, e.g., with Kenya Forest Service (KFS) and with organisations involved in charcoal-related research and development like the United Nations Development Program (UNDP).

What policies and strategies helped the success?

Successful partnerships, training of charcoal producers, and charcoal rules and regulations of Kenya, 2015.

More info:

https://www.fornis.net/node/272 and at
https://www.ke.undp.org/content/kenya/en/home/presscenter/articles/2016/sustainable-charcoal-production-using-improved-technologies.html

Sources:

Kenya Forest Service, Tel: 020-2689882.

Case uploaded:

2020-08-27

Blue Box Toilet Waste Sanivation Briquettes







Why to choose this solution?

Sanivation collects human waste from special toilets and turns it into sustainable fuel, which improves sanitation and reduces the environmental impact of burning wood. It creates fuel briquettes for cook stoves, which comes from its toilet service in Naivasha (Kenya). The briquettes are cheaper, cleaner, and longer-lasting than charcoal.

Savings per day or production:

Sanivation briquettes burn 1 hour 45 minutes longer than charcoal, thus they are more economical to use. They reduce the demand for charcoal and wood for cooking and heating, as well as help to protect the environment.

Cost in money and in own time to construct:

Installation of the blue box is free, but the users pay a basic monthly service fee of KES 200 (USD 2) for the human waste to be collected twice a week. Installation takes one day.

Lifetime:

Not specified.

Maintenance needed:

The blue box condition is inspected during the collection of human wastes twice a week.

Resources needed in use:

The blue box, the service, and efficient cookstoves to cook with the fuel produced.

Problems and limits:

The initial monthly household service fee was set at KSh 600 (USD 6) which proved very expensive for the users. It was then reduced to the present KSh 200, which made a big difference in uptake. The initial plan was to use flower waste from nearby flower farms, in addition to charcoal dust. However, the cost of carbonizing flower waste was found to be too high, so the focus shifted to charcoal dust, which is readily available. At times, production may be affected by fluctuations in grid electricity from Kenya Power.

Where and how can you get it or make it?

Available in Naivasha and Nakuru counties, Kenya. Beneficiaries of the Blue Box are identified by Sanivation Sales Agents.

Skills needed to produce, install. maintenance, use:

Skills needed to install and to maintain the Blue Box include engineering, energy, and construction skills. There are written instructions on how to use the Blue Box.

How to use it:

To be added.

How to maintain it:

To be added.

Climate effect (if any):

People who replace charcoal with briquettes reduce their emissions by not burning charcoal. The briquettes save about 50% of emissions, which is about 2 tons CO2-equivalent/year if 2.5 kg wood/day are saved. There is a high rate of tree loss in the area, and every ton of charcoal sold saves about 88 trees.

Why is it successful?

It is affordable. It sustainably replaces some amounts of other charcoal, saving trees and removing some part of the contribution of fuelwood to climate change. It conveniently offers reliable, user-focused, vertically integrated sanitation services. Another critical benefit of the Sanivation service, according to studies conducted by Sanivation, is reduction of the number of people suffering from diseases related to improper human-waste disposal.

If you can make it, a short description, typical problems, materials needed:

Materials needed include Blue box, human wastes, charcoal dust, centrifugal briquetting machine, and drying trays. The expertise of trained technicians is also necessary.

How to make it (if possible):

https://youtu.be/bPwwUaKJVfY

How is it delivered and by whom?

Beneficiaries of the Blue Box are identified by Sanivation Sales Agents and although they are installed for free, the home owner signs an agreement with Sanivation to abide with the written instructions on how to use the Blue Box, and to pay a basic monthly service fee of KSh 200 (USD 2) for the human waste to be collected twice a week. The location of all Blue Boxes is established using GPS coordinates, and moving a Blue Box from one house to another is allowed with prior consultation.

Successful financial model

Support for development, training.

What policies and strategies helped the success?

Successful partnerships with the Nakuru County government as well as with Naivasha Water and Sanitation Company (VAIVAWASCO). The Centers for Disease Control and Prevention (CDC) Kenya and the CDC Waterborne Disease Prevention Branch are collaborating with Sanivation through a CDC Innovation Fund Award to help scale-up their waste collection and treatment activities beyond household subscribers.

More info:

Sanivation http://www.sanivation.com

Sources:

Sanivation, Mr. Benjamin Kramer, E-mail: Benjamin@sanivation.com. Tel: +254 716 963 462.

Case uploaded:

2020-08-18

Coconut Husks and Charcoal Dust Briquettes





Why to choose this solution?

In Tanzania, after the edible portions of the coconut fruit are consumed, the husks often are thrown away or burnt. Improper disposal and burning of husks creates environmental problems such as air pollution and chocked (gutter) mosquito-breeding sites that support transmission of mosquito- borne cholera, malaria, and fever.

Savings per day or production:

The wholesale price of a bag of charcoal weighing between 50- 75 kg runs to TSh 45,000 - 70,000 (USD 19.50 - 30). Thus, one kilogram of charcoal costs about 900Tsh (USD 0.4), whereas one kilogram of briquettes is sold at TSh 600-700 (USD 0.25-0.30). Briquettes are more affordable than wood charcoal. Their greater efficiency stems from their higher calorific value, longer burning time, and more even heating.

Cost in money and in own time to construct:

To produce one ton of briquettes, SEECO incurs a total cost of TSh 305,104 (USD 130). These costs include materials, labour, transportation of materials, and overhead costs. To produce 1-1.5 ton, 6-8 hours are required.

Lifetime:

N/A

Maintenance needed:

Regular maintenance of the briquette-making machines is required, including replacement of bearings, etc.

Resources needed in use:

An improved cookstove is required to use the briquettes for cooking. There is no need for a specific model of stove, since the briquettes burn well in normal charcoal-burning improved stoves.

Problems and limits:

Low community awareness of the potential benefits of briquettes limits its use, especially in households. Another challenge might be limited availability or increased costs of feedstock at a future peak of briquette markets.

Where and how can you get it or make it?

It is available in Tanzania markets and is produced by SEECO social enterprise. Some training, investment in machines, and construction of carbonization kilns is required to be able to produce briquettes.

Skills needed to produce, install. maintenance, use:

Simple training is required to be able to produce briquettes. Proper ratios must be used to mix materials required for briquette production. Some training is required on how to use the briquette- production machines.

How to use it:

How to maintain it:

Climate effect (if any):

Methane is a greenhouse gas which is mostly emitted from decomposing waste. It has more than twenty times the potency of carbon dioxide and is ranked as a dangerous contributor to climate change. Using coconut husks and charcoal dust to produce briquettes avoids the production of some methane while producing clean fuels which are useful for cooking. Carbonization of coconut husks is undertaken in simple retort kilns through pyrolysis-process gas, thus less biomass is used to initiate carbonization before the process becomes self-sustaining.

Why is it successful?

Briquettes are more affordable than most existing fuels. They are more efficient, since they have a higher calorific value, and long burning time. They are user-friendly, clean, and smokeless.

If you can make it, a short description, typical problems, materials needed:

Required materials include coconut husks, charcoal dust, and a binder of cassava flour. After binding into shape, it requires sun and ground space to dry.

How to make it (if possible):

(video coming)

How is it delivered and by whom?

Main actors include wood-charcoal wholesalers and retailers, coconut-oil producers, cassava-flour dealers, SEECO social enterprise, transporters, and end-users. SEECO always works to maintain the high quality of its briquettes. The enterprise uses a business approach to deliver briquettes to targeted end-users. SEECO uses marketing personnel to identify and to sell to potential customers, who are provided with product samples to test. The majority of people who have tested SEECO briquettes come back to buy more. In an average week, SEECO sells about one ton of briquettes to existing customers.

Successful financial model

Initial investment capital was covered by a grant from a development programme. SEECO covers operational and maintenance costs through business returns.

What policies and strategies helped the success?

The National Energy Policy of 2015 promotes fuel alternatives to replace wood charcoal; the Draft Biomass Energy Strategy (BEST) identified briquettes from waste as one promising alternative cooking fuel. Support come as well from the former Minister of Environment of Tanzania, Mr. January Makamba, who organized awards for competitions of the briquette producers.

More info:

SEECO, Tanzania. https://sescom.co.tz/seeco , https://www.facebook.com/SEECOtz/

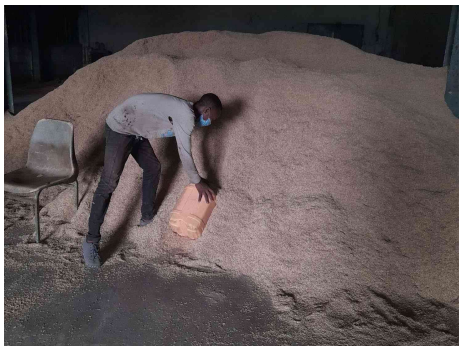
Sources:

Case uploaded:

2020-08-18

KIDT Rice Husks Charcoal Briquettes





Why to choose this solution?

Rice husks charcoal briquettes is an alternative to wood charcoal as it provides energy for cooking in households, learning institutions, hospital, for cooking various kinds of foods such as beans, Ugali, rice etc.

Savings per day or production:

"2kg of rice husk briquettes charcoal worth 600 Tshs is enough for cooking one day meals for a household whereas if wood charcoal is used, Tshs 1000/= will be require to accomplish the task. For institution they can consume 30kg of rice husks briquettes per day instead of 70kg of wood charcoal. "

Cost in money and in own time to construct:

1kg of briquette is sold Tsh 300/=

Lifetime:

N/A

Maintenance needed:

All measures should be in place to ensure briquettes do not come into contact with water

Resources needed in use:

Rice husks are raw material for producing the briquettes

Problems and limits:

"Since availability of rice Husks is seasonal, it requires capital for purchasing and also area for storage."

Where and how can you get it or make it?

It is available at Kilimanjaro Industry Development Trust (KIDT) Moshi- Kilimanjaro in Tanzania

Skills needed to produce, install. maintenance, use:

" Skills for producing rice husks briquettes charcoal available at KIDT. Short training and machines are required to be able to produce KIDT briquettes.

How to use it:

" https://youtu.be/svbpv06B8FU

How to maintain it:

" https://youtu.be/yhvvWwU72bc

Climate effect (if any):

Offer an alternative energy to wood hence reducing the growing demand for wood charcoal therefore contributing to reduced deforestation. Briquettes are made out of rice husks which if not used would have rot leading to generate methane contributing to greenhouse gas emissions.

Why is it successful?

It is successful because it is cheaper and its heat last longer.

If you can make it, a short description, typical problems, materials needed:

" "Not applicable, needs a skilled technician"

How to make it (if possible):

" https://youtu.be/OrvNS51wae0

How is it delivered and by whom?

Successful financial model

What policies and strategies helped the success?

Donors community such as JICA -Japan has been supporting this project with the aim to limit deforestation and the effects of climate change.

More info:

"www.kidt.org, njaujean@mail.co.tz"

Sources:

KIDT (Kilimanjaro Industrial Development Trust)

Case uploaded:

2022-03-30

Maa Briquette





Why to choose this solution?

This solution uses charcoal dust, maize cobs, maize stalks, and waste vegetable matter to make smokeless briquettes which are dried and then sold as fuel. The briquettes burn three times longer than charcoal, and are smokeless, hence pose much less risk to the respiratory health of the user. At the same time, use of briquettes resolves the environmental challenge of exploitation of trees.

Savings per day or production:

Saves about 60 trees per day per 500 households. The briquettes burn three times longer than charcoal and are smokeless, hence posing minimal risk to the user respiratory health.

Cost in money and in own time to construct:

Cost about six Million Kenya Shillings (USD 60,000).

Lifetime:

Not specified.

Maintenance needed:

Repair of the briquetting machine in case of any breakdown.

Resources needed in use:

Improved cookstoves (Jikos) to use the briquettes for cooking.

Problems and limits:

It is a challenge to revamp the sole-proprietor business into a company due to numerous prerequisites and capital required for expansion. For the enterprise to be considered as a company, a lot of investment has to be put in place, licensing, upscaling equipment, and mentors are needed.

Where and how can you get it or make it?

Available in Kajiado County ,Kenya.

Skills needed to produce, install. maintenance, use:

Production of the briquettes requires a short training session.

How to use it:

https://youtu.be/QNiROZI9dGw

How to maintain it:

To be added.

Climate effect (if any):

According to George Mochu, the owner of Maa Briquette, this solution has helped to reduce deforestation significantly. Initially, ten trees would be cut daily-- amounting to seventy trees per week -- for fuel. With the

use of these briquettes, only one or two trees are felled per week for the over 500 households reached.

Why is it successful?

It is an affordable, easily accessible fuel. It is smokeless, efficient, and environmentally friendly.

If you can make it, a short description, typical problems, materials needed:

To make Maa Briquettes, the user should first source the raw materials, which are charcoal dust, maize cobs, maize stalks, and any agricultural waste, all of which must be carbonized first for production. These carbonized materials are sorted by sieving, then put through a hammer mill, where they are ground to a fine powder. They then go into a mixing machine, where they are mixed with a binder and water. After production, they are dried either outdoors or inside a solar dryer.

How to make it (if possible):

https://youtu.be/QNiROZI9dGw

How is it delivered and by whom?

Maa briquettes are either delivered to customers by sales agents in pickup vehicles or bought directly and transported by customers.

Successful financial model

A local bank loan financed the purchase of the Briquette machine. Repayment of the loan has been facilitated through the returns and also through training other people on how to make the briquettes. The enterprise won the 2014 Green Innovation Award, which has brought further technical assistance in terms of planning. Successful partnerships with the National Environment Trust Fund from Kenya and with the Kenya Climate Change Innovation Center were involved. The company also conducted market research and has established a market base.

What policies and strategies helped the success?

Online marketing is done via social media, with information as to whether the briquettes are ready for purchase. Successful partnerships with the National Environment Trust Fund from Kenya and with the Kenya Climate Change Innovation Center assisted the owner in creating a feasible business plan.

More info:

https://www.changemakers.com/discussions/entries/maa-briquettes and
https://www.charcoalproject.org/entrepreneurs/maa-briquettes/

Sources:

Maa briqutte, Kenya. Email: maabriquette@gmail.com. Tel:+254 728 284768.

Case uploaded:

2020-09-29

Fuelwood - Planting







Why to choose this solution?

Trees are vital. Trees give us oxygen, store carbon, stabilise the soil, and help to support the diverse wildlife of the world. They also provide us with materials for tools and shelter as well as fuel for cooking. Trees such as shear nut provide natural oils, which can be used for cooking and in personal- care products such soap, Vaseline, creams, and lotions. These natural oils are also medicinal, providing health benefits to the skin and to the entire body. Tree-planting is recommended to help mitigate climate change and its effects, e.g., drought, insufficient rains, destructive winds, floods, energy crises, and loss of soil. Tree-planting can also be done to earn income.

Savings per day or production:

The cost is low because tree-planting uses locally available resources like seedlings, manure, soil, and labour. Trees can also help reduce household bills for air conditioning and for heating bills. Trees contribute to their environment by providing oxygen, improving air quality, helping to slow climatic deterioration, conserving water, preserving soil, and supporting wildlife. During the process of photosynthesis, trees take in carbon dioxide and produce the oxygen we breathe.

Cost in money and in own time to construct:

Tree seedlings cost between USh 50 to 5000 (USD 0.01-to 1.4). Some seedlings and seeds can even be accessed locally, free of charge. Family labour can be used during establishment, and even if no members are available at home, you can plant your trees gradually until you accomplish the plantation. Cooking oil and cosmetics from natural oils from trees cost between USh 5000 and 50,000 UGX (approximately 1-14 USD).

Lifetime:

This may depend on the purpose. For example, one might harvest and manage the trees for regeneration for future uses. Durability also depends on the tree species, as some trees can last between 10-25 years.

Maintenance needed:

Weeding, pruning, protection against fire and animals, and too in some cases, spraying to control pests and diseases.

Resources needed in use:

Hoe, slasher, panga, manure, labour, spray pump, pesticide/fungicides.

Problems and limits:

Land shortages, prolonged dry spells, high temperatures, fires, inaccessibility of seedlings to some locations, varying sunshine, insufficient rains, financial capital to manage tree-planting, and theft of the trees.

Where and how can you get it or make it?

Seedlings and seeds can be accessed from tree nursery centres all over the country, from the bush as wildings, from existing forests, or below the trees on farms. Woodlots can also be established using Farmer Natural Regeneration Management.

Skills needed to produce, install. maintenance, use:

Knowledge of how to plant trees, spacing needed, where to plant.

How to use it:

Not relevant.

How to maintain it:

Not relevant.

Climate effect (if any):

Trees absorb CO2 by removing and storing the carbon while releasing oxygen back into the air. In one year, an acre of mature trees absorbs the same amount of CO2 produced when you drive your car 26,000 miles. Trees also play a big role in conserving water, preserving soil, and supporting wildlife.

Why is it successful?

Tree management practices as well as the trees themselves satisfy the needs of the farmers. Availability of land and bondage to culture. Fuel wood planting has been also successful because of support from the government and other development partners through provision of seedlings, awareness creation and capacity building trainings.

If you can make it, a short description, typical problems, materials needed:

Establishing a woodlot requires trained personnel. Typical problems associated with tree-planting include insufficient rains, drought, floods, animals, fires, limited quality seedlings, and financial constraints. Materials needed include manure, fertile black soil, seedlings, water, stakes, string, hoes, panga, basins.

How to make it (if possible):

Not necessary.

How is it delivered and by whom?

Not necessary.

Successful financial model

Support for development, trainings.

What policies and strategies helped the success?

The Government, the private sector, and civil society have supported tree-planting initiatives in the country. Communities are involved tree growing through local groups, training sessions in tree-growing, and management. The Tree-Planting Act of 2003 has helped, as has the Forestry Policy of 2001. Community by-laws help to guide the initiative (e.g., Before you cut existing trees, plant new trees.â€•). The governmental project Operation Wealth Creation (OWC) provides seedlings, especially of fruit trees.

More info:

http://spgs.mwe.go.ug/sites/files/SPGS%20Issue%2039.pdf and https://facethefuture.com/downloads/FtF_The-contribution-of-forests-to-climate-change-mitigation_LR.pdf

Sources:

JEEP, 7 Miles, Gayaza Rd, Kyanja, Kampala, P. O. Box 4264, Uganda. +256 414 578 316. Email: info@jeepfolkecenter.org. https://jeepfolkecenter.org

Case uploaded:

2020-12-07

Sunking Pico-plus solar lamp







Why to choose this solution?

The Sunking P-co-plus strikes the perfect balance between performance and affordability. It is mobile you can take it anywhere with ease for work, study, or travel. It is designed to meet essential lighting needs. Provides up to 72 hours of light on a single charge, it is 5 times brighter than a kerosene lamp and has a dual charging option.

Savings per day or production:

It helps save a maximum of 2000 Uganda shillings (USD 1) per day which will have been spent on buying Kerosene hence reducing on household expenditures.

Cost in money and in own time to construct:

Sunking Pico-plus solar lamp costs 30,000 Uganda shillings (USD 8).

Lifetime:

It has a 5 year battery life. After the 5 years the battery may need replacement.

Maintenance needed:

The lamp should not be left out in rain. Put the lamp in the sunlight for charging. Needs to be stored under a dry place.

Resources needed in use:

Sunlight for charging; the panel, the LED, and the battery are all inbuilt.

Problems and limits:

The initial investment is somewhat high, which may make it inaccessible to low-income households. During the rainy season, once not charged it maynot be able to provide sufficient light.

Where and how can you get it or make it?

JEEP folkecenter and other solar distribution outlets across the county.

Skills needed to produce, install. maintenance, use:

Production of the Sunking Pico-plus needs a technical personnel. Use and maintenance only needs a small introduction.

How to use it:

Not applicable

How to maintain it:

Not applicable

Climate effect (if any):

It is environment-friendly since there is no emission of carbon. Solarlampsrun solely on natural radiation from

the sun. The lamp reduces carbon emissions to the atmosphere in cases where kerosene lamps are used, hence conserving the environment. It is simple, reliable, and safe to the person operating it. It is also energy-efficient.

Why is it successful?

It is efficient and can be operated easily. It has contributed greatly to reduction of kerosene- and candle-related accidents and deaths in homes. It has improved health and increased productive hours, since all of the family can use it at the same time for different activities.

If you can make it, a short description, typical problems, materials needed:

It requires a skilled and technical personnel to produce.

How to make it (if possible):

Not applicable

How is it delivered and by whom?

Successful financial model

Support from donor agencies and other development partners provides these lamps at a subsidized price.

What policies and strategies helped the success?

Government programs implemented by different ministries, for example the Ministry of Energy and Mineral Development as well as the Ministry of Water and Environment, are conducting training of communities on the benefits of solar energy. Training and advocacy are being provided in communities to instill positive attitudes toward environmental conservation. The government, through the Ministry of Health, is encouraging promotion of solar power in off-grid, peri-urban, and rural areas. There are many solar subsidies and tax waivers, which have been put in place through the Uganda revenue authority.

More info:

Email: info@jeepfolkecenter.org https://jeepfolkecenter.org/

Sources:

Joint Energy and Environment Projects

Case uploaded:

0000-00-00

Gaitheri Secondary School Solar PV Roof







Why to choose this solution?

The iron-sheet roof is covered in tiles fitted with energy-producing solar cells, an innovative solar- power technology known as building-integrated photovoltaic (BIPV) offering an alternative to adding solar panels on top of a conventional roof to produce power from the sunâ€™s energy. The energy thus produced has enabled students to improve their performance thanks to more reliable power, which means they can study even after dark. This solution also buffers the school against failures of a costly and unreliable national grid power.

Savings per day or production:

The solar tiles have reduced the school spending on electricity from KSh 5,000 (USD 50) per month, which is largely a fixed charge for access to grid power, to 1,500 KSh (USD 15) a month, or KSh 50 (USD 0.5) per day. This has translated to savings of about KSh 3,500 (USD 35) per month.

Cost in money and in own time to construct:

A grant of USD 2,000 (KSH 200,000) from the United States African Development Foundation (USADF) through Young African Leaders Initiative (YALI) was provided to implement the Gaitheri solar-roof project.

Lifetime:

30 years, if kept in good condition.

Maintenance needed:

The only maintenance required by the system is to clean the tiles regularly, when they are covered with dust or leaves.

Resources needed in use:

Iron sheet roofs, Building Integrated Photovoltaic (BIPV) tiles, sunlight, power control unit, a battery bank of 8-Volt batteries.

Problems and limits:

Installing solar panels on the roof is expensive. Its intake is reduced by cool, cloudy, or foggy weather. Market penetration is still slow, given that the technology is new and will require some time to achieve acceptance among a wider customer base. Lack of awareness on the potential of photovoltaics is widespread.

Where and how can you get it or make it?

It is available in Kiharu Constituency, within the Muranga County. The system is provided by Strauss Energy.

Skills needed to produce, install. maintenance, use:

Production, installation, and maintenance need expertise in engineering, energy, and construction. The use requires only a short introduction.

How to use it:

To be added.

How to maintain it:

Not relevant.

Climate effect (if any):

The school no longer uses kerosene and candles, which emit smoke, a source of global black carbon that is detrimental to health and that also worsens to global climate change.

Why is it successful?

It is successful because it ensures uninterrupted power supply for the computer lab. The system has a power control system, and there is no danger of power surges that are used to destroy plugged- in electrical gadgets after a blackout. Thus, the system has reduced related losses for repair or replacement of affected gadgets. The system also costs little to operate and to maintain.

If you can make it, a short description, typical problems, materials needed:

Materials include an iron-sheet roof, Building Integrated Photovoltaic (BIPV) tiles, power control unit, and a bank of 8-Volt batteries.

How to make it (if possible):

Not relevant.

How is it delivered and by whom?

The business model is installation by Strauss Energy, providing renewable and cost-effective energy through BIPV technology, a revolutionary solar- powered roofing tile designed and made in Kenya. Through the YALI program, Strauss Energy received a grant of USD 2,000 from the United States African Development Foundation (USADF) to implement the Gaitheri solar-roof project.

Successful financial model

Support for development and public relations through Strauss Energy.

What policies and strategies helped the success?

Received a grant from the United States African Development Foundation (USADF) through the YALI program to implement the solar-roof project.

More info:

http://straussenergy.com/

Sources:

Strauss Energy, Climate Innovation Centre CIC, 3rd Floor, Strathmore Business School (SBS),Ole Sangale Close, Madaraka. P. O. Box 15028- 00100, Nairobi, Kenya. Tel: +254 020 440 9938 | +254 733 448438, Email: infor@straussenergy.com

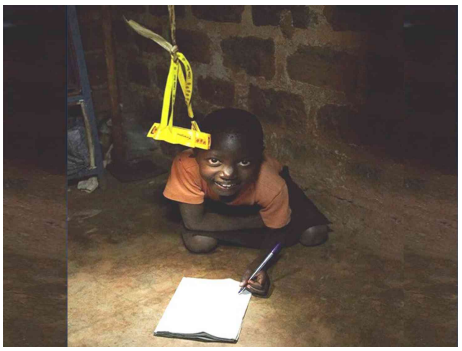
Case uploaded:

2020-08-24

Little Sun Solar Lamp







Why to choose this solution?

The solution provides light in homes and can also be used as torch. It helps in lighting for homes, it has Dimensions of 12x2.9cm and weight of 120 g including batteries and all is recyclable. The solar panel has PV of 0.5W and battery capacity of 500 mAh.

Savings per day or production:

The Little Sun solar lamp reduces financial bills, since it is bought once and replaces paraffin or candles for lighting. This helps the family to save money to be used for other domestic needs. It helps by reducing indoor-pollution-related diseases of the lungs and eyes. It also helps in reducing accidents caused by kerosene lamps and candles in the homes. It is environment-friendly, as there is no release of CO2/kWh emission, when used. These factors, combined with customer experiences, show the lamp to be technically proven, environment friendly, and economically better.

Cost in money and in own time to construct:

The lamp is very cheap compared to the price of buying paraffin each day. The lamp costs USh 35,000 (USD 10).

Lifetime:

The lamp has two-year warranty. The battery will last up to five years when used daily.

Maintenance needed:

The lamp should not be left out in rain. Put the lamp in the sunlight for charging.

Resources needed in use:

Sunlight for charging; the panel, the LED, and the battery are all inbuilt.

Problems and limits:

The intervals between charges of the battery become shorter over time with repeated recharging; they must be charged for at least eight hours on the first use. The initial investment is somewhat high, which may make it inaccessible to low-income households.

Where and how can you get it or make it?

JEEP is promoting these lamps in many districts of Uganda. So far, 7552 lamps have been distributed. This solar lamp is designed in Germany, manufactured in China, then airlifted to Uganda. In Uganda it can be accessed at JEEP Folkecenter.

Skills needed to produce, install. maintenance, use:

Requires skilled personnel to produce. Maintenance and use do not require unusual skills.

How to use it:

Not relevant.

How to maintain it:

Not relevant.

Climate effect (if any):

It is environment-friendly since there is no emission of carbon. Solar lamps run solely on natural radiation from the sun. The lamp reduces carbon emissions to the atmosphere in cases where kerosene lamps are used, hence conserving the environment. It is simple, reliable, and safe to the person operating it. It is also energy-efficient.

Why is it successful?

It is efficient and can be operated easily. It has contributed greatly to reduction of kerosene- and candle-related accidents and deaths in homes. It has improved health and increased productive hours, since all of the family can use it at the same time for different activities.

If you can make it, a short description, typical problems, materials needed:

Trained personnel are required to make this product.

How to make it (if possible):

Not relevant.

How is it delivered and by whom?

The business model for the Little Sun solar lamp involves procuring the products and selling them to the end-users. This lamp is tested by Uganda National Bureau of Standards and can be purchased by any person in Uganda. The lamp can be accessed from JEEP Folkecenter in Uganda.

Successful financial model

Support from donor agencies and other development partners provides these lamps at a subsidized price.

What policies and strategies helped the success?

Government programs implemented by different ministries, for example the Ministry of Energy and Mineral Development as well as the Ministry of Water and Environment, are conducting training of communities on the benefits of solar energy. Training and advocacy are being provided in communities to instill positive attitudes toward environmental conservation. The government, through the Ministry of Health, is encouraging promotion of solar power in off-grid, peri-urban, and rural areas. There are many solar subsidies and tax waivers, which have been put in place through the Uganda revenue authority.

More info:

https://littlesun.com/uganda/ and JEEP

Sources:

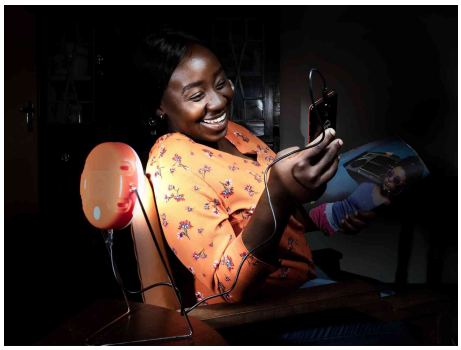
7 Miles, Gayaza Rd, Kyanja,Kampala, P. O. Box 4264, Uganda. Tel: +256 414 578 316. Email: info@jeepfolkecenter.org. https://jeepfolkecenter.org/

Case uploaded:

2020-10-15

Solar Lamp D.light S200







Why to choose this solution?

The d.light S200 solar lantern is lightweight (only 50 grams), affordable mobile charging lantern,has a unique dome lens that spreads soft ambient lighting throughout the room, and its long-lasting battery allows charging of mobile phones via its USB port.The S200 also provides three different brightness settings, from "Low" to "High", to suit the user need. Whether it is working at night or simply socializing, the S200 is a constant companion. Its battery produce 20 hours of light per full charge.

Savings per day or production:

The d.light S200 solar lantern is affordable mobile charging lantern with double the savings. Saves the user about KSH 150(USD 1.5) per day used on kerosine and phone charging.

Cost in money and in own time to construct:

Costs KSH 2,500(USD 25).

Lifetime:

Five years if used accordingly.

Maintenance needed:

D.light S200 is maintenance free.

Resources needed in use:

Uses Solar energy to charge the solar panel that is plugged into the lantern.

Problems and limits:

The price of d.light S200 is a bit high and not easily affordable by most of the rural poor communities.

Where and how can you get it or make it?

D.light lamp products are available in over 25,000 retail outlets around the globe. One can also purchase the products online.

Skills needed to produce, install. maintenance, use:

Only produced and installed by skilled persons from D.light company.The d.light S200 is maintainance free and its easy and simple to use, just press of a button and adjusting brightness settings.

How to use it:

https://fb.watch/cmpRHl16ML/ (video by d.light design Facebook)

How to maintain it:

Not relevant,

Climate effect (if any):

D.light S200 lamps are environmentally friendly since they do not emit carbon and also saves the atmosphere

from carbon emitted by kerosine lamps.

Why is it successful?

Successful because they are excellent product, readily available, affordable and the payGo startegy that serves the customers better. D.light leads the way with a two-year warranty and dealer support through field-based staff, marketing materials, and in-country call centers. 90% of d.light customers rate their product as a good value for money and would recommend d.light to a friend.

If you can make it, a short description, typical problems, materials needed:

Only made by skilled personel from D.light company.

How to make it (if possible):

Not relevant

How is it delivered and by whom?

D.light has a global network of excellent distribution partners that enable them reach customers across the world.

Successful financial model

Support from investors, they enable payment with PayGo technology

What policies and strategies helped the success?

PayGo strategy, undertaking sales promotion,the Energy(Solar Water Heating) Regulations 2012 has enhaced surge in solar use in Kenya,D.light S200 also meets Lighting Global quality standards.

More info:

https://www.dlight.com/product/s200/

Sources:

https://www.dlight.com/product/s200/

Case uploaded:

2022-05-05

Solar Sisters Lamp System - Sunking Home 120







Why to choose this solution?
The lamp can light up to 4 rooms for up to 24 light hours, charges up to 3 phones and it has a security light.

Savings per day or production:
The solar powered lamp can save 1200 Tsh per day

Cost in money and in own time to construct:
N/A

Lifetime:
5 Years lifetime, replaceable during warranty

Maintenance needed:
After 5 years, repair of plastic nylon is needed.

Resources needed in use:
Solar power in form of sunshine.

Problems and limits:
Not easily affordable by very poor communities.

Where and how can you get it or make it?
Available at Solar Sister Entrepreneurs.

Skills needed to produce, install. maintenance, use:
Fabricated in industry, repair need special skills.

How to use it:
https://www.youtube.com/watch?v=makgV217HEk

How to maintain it:
https://www.youtube.com/watch?v=2qljxg8qxrc

Climate effect (if any):
The solar lamp reduces CO2 emission and it is environmental friendly.

Why is it successful?
It is affordable, clean and reliable source of light.

If you can make it, a short description, typical problems, materials needed:
N/A

How to make it (if possible):
N/A

How is it delivered and by whom?

Successful financial model

What policies and strategies helped the success?

The Tanzanian government supports solar projects in several ways; through legislation as well as by providing financial support. Projects which qualify for such funding might take different forms, and range from lighting initiatives to large-scale solar PV fields.

More info:

Sources:

https://solarsister.org/

Case uploaded:

2022-05-02

Sunking Pico-Plus Solar Lamp





Why to choose this solution?

The Sunking Pico-Plus Lamp is an upgraded model of the original popular model of Little Sun. It is mobile, you can take it anywhere with ease for work, study, or travel. It provides up to 72 hours of light on a single charge, which is is 5 times brighter than a kerosene lamp and has a dual charging option. You can charge the PV panel on the lamp with sun, but also from electric plug through an USD stick.

Savings per day or production:

It helps to save about 2000 Uganda shillings (USD 1) per day, compared to buying Kerosene, hence reducing on household expenditures.

Cost in money and in own time to construct:

Sunking Pico-plus solar lamp costs 30,000 Uganda shillings (USD 8).

Lifetime:

It has a 5 year battery life. After the 5 years the battery may need replacement.

Maintenance needed:

The lamp should not be left out in rain. Put the lamp in the sunlight for charging. Needs to be stored under a dry place.

Resources needed in use:

Sunlight for charging; the panel, the LED, and the battery are all inbuilt.

Problems and limits:

The initial investment is somewhat high, which may make it inaccessible to low-income households. During the rainy season, once not charged it maynot be able to provide sufficient light.

Where and how can you get it or make it?

JEEP Folkecenter and other solar distribution outlets across the county.

Skills needed to produce, install. maintenance, use:

Production of the Sunking Pico-plus needs a technical personnel. Use and maintenance only needs a small introduction.

How to use it:

How to maintain it:

Climate effect (if any):

It is environment-friendly since there is no emission of carbon. Solarlamps run solely on natural radiation

from the sun. The lamp reduces carbon emissions to the atmosphere in cases when they are used instead of kerosene lamps, hence conserving the environment. It is simple, reliable, and safe to the person operating it. It is also energy-efficient.

Why is it successful?

It is efficient and can be operated easily. It has contributed greatly to reduction of kerosene- and candle-related accidents and deaths in homes. It has improved health and increased productive hours, since all of the family can use it at the same time for different activities.

If you can make it, a short description, typical problems, materials needed:

It requires a skilled and technical personnel to produce.

How to make it (if possible):

How is it delivered and by whom?

Successful financial model

Support from donor agencies and other development partners provides these lamps at a subsidized price.

What policies and strategies helped the success?

Government programs implemented by different ministries, for example the Ministry of Energy and Mineral development as well as the Ministry of Water and Environment, are conducting training of communities on the benefits of solar energy. Training and advocacy are being provided in communities to instill positive attitudes toward environmental conservation. The government, through the Ministry of Health, is encouraging promotion of solar power in off-grid, peri-urban, and rural areas. There are many solar subsidies and tax waivers, which have been put in place through the Uganda revenue authority.

More info:

Email: info@jeepfolkecenter.org https://jeepfolkecenter.org/ and
https://sunking.com/solar-lanterns/sun-king-pico-plus/

Sources:

Joint Energy and Environment Projects, Uganda.

Case uploaded:

2023-01-23

Kibindu Gasifier and Solar Hybrid Mini-Grid





Why to choose this solution?

Rural electrification is a critical challenge in developing countries, and Tanzania is no exception. Kibindu Village is located in the Chalinze District of the Coast Region and has a population of about 10,000 people. Up to and including the year 2015, diesel generators were the main sources of electricity for the villagers. The solution provided is to facilitate generation of electricity through a hybrid mini-grid system and to develop a distribution network. Kibindu mini-grid is a hybrid system of biomass gasifier system (20kW/32KVa) and solar PV (20kW). The gasifier uses maize cobs as a feedstock to generate electricity. The village has the potential to supply 40 tonnes of maize cobs per season. The Kibindu mini-grid can supply electricity to more than 200 households, SMEs, and institutions. Kibindu mini-grid is a renewable energy-based system supplying reliable and clean electricity to villagers who previously had to rely on wicked lamps, candles, and diesel generators for lighting and for productive activities.

Savings per day or production:

Customers receiving their power from the mini-grid realize significant savings in comparison to the costs to them for diesel generators, formerly their only major power source. Savings of time and money have also been realized by local government officials at village and ward offices, as they are no longer traveling to town for stationery and printing services. Social services have improved, and time frames for executing business services have been shortened.

Cost in money and in own time to construct:

Installation of the two systems (gasifier and solar) and the distribution network (grid) cost about USD 200,000.

Lifetime:

About 15 to 20 years for the solar panel and the gasifier; three to four years for solar batteries.

Maintenance needed:

For the gasifier, maintenance of the combustion engine is needed in case tar accumulates. For the solar part, maintenance requirements are relatively easy; even more so for the batteries.

Resources needed in use:

Biomass, in this case maize cobs; and solar energy.

Problems and limits:

With biomass gasifiers, too much particulate matter, tar, or other residues decreases the lifetime of the combustion engine and makes frequent maintenance necessary. The main strategy to address this challenge is to equip gasifier systems with a gas filter. This raises the costs, requires frequent cleaning of the filter system, and often produces much carcinogenic waste, especially in the case of wet stripping of the gas. Sometimes obtaining gasifier feedstock is a challenge.

Where and how can you get it or make it?

This system is installed in Kibindu village, Chalinze District, Coast Region in Tanzania.

Skills needed to produce, install. maintenance, use:

Skilled technicians are required for installation, maintenance, and operation of the gasifier as well as of the solar hybrid mini-grid system.

How to use it:

https://www.youtube.com/watch?v=IsHP45imXj0

How to maintain it:

https://www.youtube.com/watch?v=WLV-FgxRx4g

Climate effect (if any):

Electricity generated from the hybrid mini-grid in Kibindu has reduced the use of fossil fuels and thereby has helped to lower the villageâ€™s CO2 emissions. Emissions that would have resulted from decomposition of maize cobs are avoided through conversion of waste to energy. Solar power is renewable energy.

Why is it successful?

The rate of rural electrification is still low in the country (only about 17%). Demand for sustainable energy for both domestic and business purposes is growing rapidly.

If you can make it, a short description, typical problems, materials needed:

Not relevant.

How to make it (if possible):

https://www.youtube.com/watch?v=lHuD5rOiv_M

How is it delivered and by whom?

Actors: SESCOM company, Husk Power Company of Tanzania (developers), USAID development partner/donor, Kibindu villages (customer/users), REA, EWURA, Ministry of Energy, District and village authority. Part of the installation costs were covered by USADF Power Africa Grant. The system is managed by SESCOM and Husk Power; maintenance and operational costs are charged in customer bills through a pay-as-you-go system.

Successful financial model

Grant funds covered capital costs. Operational costs are recovered from payment of electricity bills.

What policies and strategies helped the success?

The first and second generation Small Power Producers (SPP) Frameworks developed by the government of Tanzania, 2008 and 2015.

More info:

Read more: http://www.tatedo.org/medias/news-articles/43-kibindu and https://www.retc.co.tz/post/Industrial-Visits-for-September-2019

Sources:

TaTEDO, MbeziJuu, Mpakani Road, Goba, House No GOB/KZD/883, P. O. Box 32794, Dar es Salaam, Tanzania. Tel: +255 738-201498, E-mail: energy@tatedo.or.tz, http://www.tatedo.or.tz

Case uploaded:

2020-09-27

Rainmaker Solar-Powered Water Pump





Why to choose this solution?

The Rainmaker is a portable solar-powered water-pumping system designed for small-scale farming and household use. It can lift water to a maximum height of 100 m, with a capacity of seven cubic meters per day, ensuring a steady supply of water for farming and household needs. It can provide sufficient water for up to 1.5 acres of irrigation. It can also be used for livestock and domestic household needs. The Rainmaker pumps a lot of water and does not use any fuel other than sunlight.

Savings per day or production:

Initially, users of electric water pumps used to irrigate crops had to pay an average of KSh 4,500- 5,000 (USD 45-50) in monthly electricity bills. Running the Rainmaker system now costs KSh 2,500-2,800 (USD 25-28) per month, saving about KSh 2,200 (USD 22) per month, i.e., KSh 73 (USD 0.73) per day.

Cost in money and in own time to construct:

Costs KSh 50,000 (USD 500). A survey fee of KSh 4,500 (USD 45) is charged when a field agent visits a site, of which KSh 2,000 (USD 20) is a sales analysis fee. Installation usually takes one day, and the technician conducts proper on-site training for end-users.

Lifetime:

Not specified.

Maintenance needed:

Post-installation issues such as permanently mounting solar modules of the Rainmaker pump on the roof.

Resources needed in use:

Water, and solar power.

Problems and limits:

Entry of cheaper fake and counterfeit products into the Kenyan market affects customer trust and confidence that have been built in their products so far and could have a negative impact on sales.

Where and how can you get it or make it?

In Kenya, SunCulture, a private company supplying Rainmaker systems, has its main office in Nairobi as well as sales outlets in Eldoret (Uasin Gishu County), Nakuru (Nakuru County), Mitunguu (Meru County), Mutithi (Kirinyaga County), and Matanya (Laikipia County), with more being planned to cater for growing demand. It supplies its products to all parts of Kenya, with most of their sales done through Facebook, radio, and direct enquiries made at the head office. In Africa, SunCulture has supplied solar water-pumping systems to Zambia (where there is a distributor), Uganda, Somalia, Ethiopia, Rwanda, Nigeria, Ghana and Mozambique.

Skills needed to produce, install. maintenance, use:

Production, installation, and maintenance require engineering skills. Use of the system requires training.

How to use it:

To be added.

How to maintain it:

To be added.

Climate effect (if any):

Not specified.

Why is it successful?

An important contribution to their success is that Sunculture has constantly designed and redesigned Rainmaker systems to meet farmersâ€™ needs. Rainmaker also pumps a lot of water and does not use any fuel. Can be used in several ways, e.g., for livestock and domestic household needs. The pump is suitable for many water sources including wells, boreholes, dams, and lakes.

If you can make it, a short description, typical problems, materials needed:

Materials needed include a 24V stainless-steel submersible water pump; 120-Watt portable solar modules; a 480-Watt-hour 24V waterproof battery bank paired with a Weather Smart Maximum Power Point Tracking (MPPT) charge controller in a lockable waterproof portable case; and a brass impact sprinkler with a 10-m radius.

How to make it (if possible):

Not relevant.

How is it delivered and by whom?

Installation of Rainmaker solar-powered water pumps is done by SunCulture Company, which has a dedicated team of 75 staff of which 60% are male and 40% female, based in various parts of the country. These include 16 full-time field-based technicians and 30 field-sales agents who provide installation services to the customers after conducting surveys. The field agents work in, and report to regional representatives in, three main regions, namely Western, Central, and the Coastal Area.

Successful financial model

SunCulture operations are currently supported by grant funding, by income from sales, and by strategic partnerships. Key funding partners include the Shell Foundation, USAID, and Microsoft, among others. The company has also attracted investment from international institutions such as Energy Access Ventures and Partners Group, which has enabled them to add business management, to widen their geographic reach, and to recruit sector-specific partners.

What policies and strategies helped the success?

The overall policy environment is favourable for SunCulture operations in Kenya, to which they can import all their products with ease. Imported solar irrigation systems are tax-exempt, and this favourable regulatory framework contributes to lower selling prices.

More info:

http://www.sunculture.com/

Sources:

SunCulture, 236, Owashika Road, Lavington, Nairobi, Kenya. Tel.: +254 700 327 002, E-mail: info@sunculture.com

Case uploaded:

2020-08-27

Small Wind Turbine - Do-it-yourself model





Why to choose this solution?

Provided that favorable wind resources are in place, small wind turbines can deliver considerable benefits for individuals or small communities. They are relatively easy to build. They can deliver important amounts of energy which can be used for a large variety of applications, from battery-charging to powering equipment. Compared to photovoltaic panels, they operate also during the night and in winter, when the sun is weaker in many regions of the world. Additionally, by producing AC current they can easily be coupled to standard electrical equipment.

Savings per day or production:

Savings are difficult to estimate, since it depends a lot on the weather conditions where the wind turbine is installed; however, once installed in the correct location, the wind turbine can deliver electricity for several years.

Cost in money and in own time to construct:

An average cost of USD 200 to 1,000 should be expected when using quality components, but the final cost can be lowered if recycled materials are used. Additionally, cheaper solutions can be found online, but the quality of the product deliver is not always matching the requirements.

Lifetime:

If built correctly, the small wind turbine should last a minimum of 15-20 years.

Maintenance needed:

Limited.

Resources needed in use:

Wood, steel, copper wires, magnets, bearings, epoxy resin (or equivalent).

Problems and limits:

Although the construction can be done by anyone, a certain knowledge of handling tools is required. Furthermore, some locations may require a taller tower, due to limited wind resources.

Where and how can you get it or make it?

A construction manual can be purchased online: https://pureselfmade.com/

Skills needed to produce, install. maintenance, use:

Knowledge of working with tools and someone to instruct (or a manual).

How to use it:

Not relevant.

How to maintain it:

Not available.

Climate effect (if any):

The installation and usage of a wind turbine means that electricity can be produced freely for the whole lifetime of the turbine. This means that fewer or no diesel generators will be needed, resulting in a considerable reduction in emissions.

Why is it successful?

Relatively simple construction which can deliver free electricity for several years.

If you can make it, a short description, typical problems, materials needed:

It is necessary to either attend a course or to follow the manual.

How to make it (if possible):

Not available yet.

How is it delivered and by whom?

Materials are quite basic and can be purchased everywhere.

Successful financial model

Not relevant.

What policies and strategies helped the success?

Open source model.

More info:

http://folkecenter.eu/pages/Publications_and_downloads_full.php#Wind

Sources:

https://pureselfmade.com/ and Nordic Folkecenter for Renewable Energy, Denmark.

Case uploaded:

2020-12-11

Solar-PV-Powered Refrigerator





Why to choose this solution?

The solar refrigerator is a cooling unit that uses electricity produced by a photovoltais (PV) solar cell panel and stored in a battery. The fridge typically has low-voltage (12V or 24 V) input. They can be used in hospitals, homes, and for commercial purposes like shops and dairy products. They are used mostly in off-grid areas. The size typically varies from 10 to 85 liters

Savings per day or production:

The solar-powered fridge helps to reduce financial bills, as once it is installed, there are no monthly bills for electricity to run it. This also helps to save money because the expenditures are reduced for buying ice blocks and diesel or petrol for generators to keep drugs and foods fresh daily in off-grid / on- grid areas. It is environment-friendly, as there is no release of CO2/kWh emission from a solar-based refrigeration system.

Cost in money and in own time to construct:

The solar-powered fridge helps to reduce financial bills, as once it is installed, there are no monthly bills for electricity to run it. This also helps to save money because the expenditures are reduced for buying ice blocks and diesel or petrol for generators to keep drugs and foods fresh daily in off-grid / on- grid areas. It is environment-friendly, as there is no release of CO2/kWh emission from a solar-based refrigeration system.

Lifetime:

It is durable. The refrigerator has a lifespan of over 10 years, the solar panel 15 years, and the batteries last 5 year.

Maintenance needed:

Unlike traditional refrigerators, there is no need for any fuel or gas. The panel must be cleaned regularly to remove dirt that can prevent sun rays from reaching the panel. The refrigerator does not need regular checking, except the usual cleaning.

Resources needed in use:

Sunlight, panel, batteries, refrigerator, wires, regulator.

Problems and limits:

Requires a relatively big investment. The initial cost involved is high, which makes it unavailable to people with low incomes. There may be a lack of good quality materials or equipment in the markets. Improper connections of wire to the refrigerator can cause short circuit.

Where and how can you get it or make it?

JEEP is promoting it. It has been installed in health centres and green power units on Ssese islands for business purposes. The solar-powered refrigerator can be purchased from shops in Uganda that sell solar equipment, or it can be shipped from China, England, Germany, etc. It will then require installation with solar panel.

Skills needed to produce, install. maintenance, use:

A trained electrical engineer must install the system and orient the end-user to start using the solar refrigerator.

How to use it:

Not necessary.

How to maintain it:

Not necessary.

Climate effect (if any):

It is environment-friendly, since there is no emission of carbon. Solar-powered refrigerators run solely on natural radiation from the sun. The system reduces carbon emissions to the atmosphere when it replaces use of generators for power. It is simple, reliable, and safe for the person operating it. It is also energy-efficient.

Why is it successful?

It is efficient and can be operated easily. It is well known and can be used in several places, e.g., for hospitals and green enterprises. It has greatly contributed to improved services at health facilities, keeping medicines and vaccines cool. Hence, it has helped to reduce the infant mortality rate in many off-grid areas. After the equipment is purchased, professional maintenance can be done after 3 -5 years.

If you can make it, a short description, typical problems, materials needed:

Not applicable. Requires trained personnel.

How to make it (if possible):

Not relevant.

How is it delivered and by whom?

The business model of the refrigerator is through procuring the refrigerator, batteries, solar panels, inverter, and other accessories. A professional electrical engineer installs these. It can be adopted and acquired by various parties through the private sector, NGOs, and government. To ensure quality, Uganda National Bureau of Standards (UNBS) and Uganda Solar Electrification Association (USEA) certify the solar equipment. The effectiveness of the solar fridges encourages people to buy these solar-powered refrigerators. Solar Associations and CSOs have promoted the use of solar energy. JEEP also promotes these technologies.

Successful financial model

Support from government and other development partners provides these refrigerators mainly in hospitals as well as in small-scale enterprises in rural, peri-urban, and off-grid areas. Establishment of solar associations has occurred. There has been training of local electricians, and â€œstart your own businessâ€• incentives have been offered.

What policies and strategies helped the success?

Government programs implemented by different ministries, for example the Ministry of Energy, are conducting training of communities on use of solar energy and use of equipment that can be installed, to encourage people to get equipment. The Uganda Ministry of Energy has brought together organisations that can procure equipment for a group, which remits funds to the organisation; it is also cheaper for the group. Training and advocacy in communities promote positive attitudes toward environmental conservation. The government, through the Ministry of Health, is promoting solar refrigerators in off-grid, peri-urban, and rural hospitals to facilitate drug and vaccine storage. There are many solar subsidies and tax waivers, which have been put in place through the Uganda revenue authority.

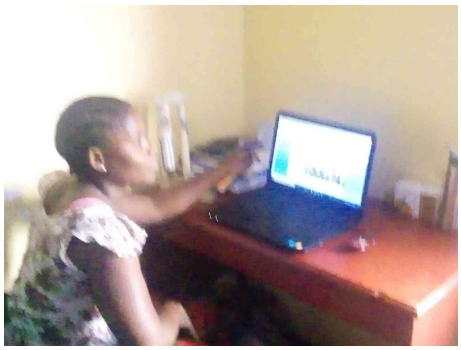
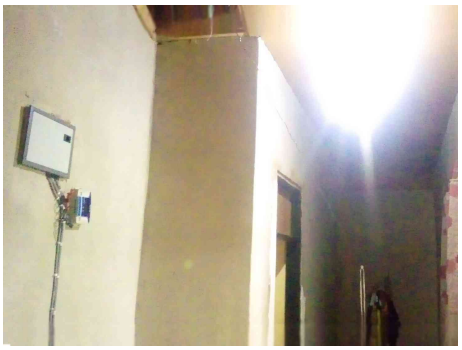
More info:

https://apps.who.int/iris/bitstream/handle/10665/254715/WHO-IVB-17.01-eng.pdf?sequence=1

Sources:

Case uploaded:
2020-10-15

Kimaroroni Solar Home System

Why to choose this solution?

Kimaroroni is a sub village within Kwasadala village. Most of the residents are Masai and few are chagga. Agriculture and livestock keeping are main economic activities. Kimaroroni village is currently not connected to the national grid electricity though demands for electricity exist for lighting, powering basic home appliances and productive economic activities. Solar Home systems (SHS) are among other options installed to address electricity demand at household level. Almost all households around rely on solar power. Most of the SHS at Kimaroroni operates for about three to five hours a day.

Savings per day or production:

Savings of 1.0Lt. of kerosene per day for an ordinary family, which cost Tsh 3,000 per 1.0.Lt.

Cost in money and in own time to construct:

The solar cost TZS. 1,200,000/= The cost covers purchase of Battery, Inventor, Solar Panel, Electric wire ring / installation, lamps accessories etc . For this case, two solar panels one of 100 watts and the small solar panel 20 watts with amplifier are available

Lifetime:

10 -20 years but it depends on use

Maintenance needed:

Ensure safety of solar panel, battery and inventor as well as lightning system-bulbs replacement

Resources needed in use:

Enough Sun light energy

Problems and limits:

Electric short in case of misuse can happen. Unavailability of electric power once sunshine is not available and no battery to conserve energy

Where and how can you get it or make it?

The equipment were purchased from Sundar solar company and installation / fixing was done by an independent technicians. Solar panels and accessories are available all over Tanzania.

Skills needed to produce, install. maintenance, use:

Installation requires skilled person, short training required to be able to do maintenance

How to use it:

https://youtu.be/f-WXQPztdZ0

How to maintain it:

https://youtu.be/Anvgg2SenaE

Climate effect (if any):

Solar is a renewable source of energy and therefore no or negligible CO2 is released from the system.

Why is it successful?

There is enough sun light. Also high demand for electricity especially in rural area where connection is still 24.5%.

If you can make it, a short description, typical problems, materials needed:

This technology requires a qualified technician to install it.

How to make it (if possible):

N/A

How is it delivered and by whom?

There are various solar system promoters/agents available in Tanzania where through them large percentage of the population have been sensitized. A good number of technicians have been trained, private sector has facilitated access to solar panel and associated accessories in many places of the country.

Successful financial model

Once initial cost has been settled, there is no monthly bills/payments for its use.

What policies and strategies helped the success?

National Energy Policy 2015 encourages diversification of energy sources; solar is among, Tax exemption on solar panels.

More info:

http://www.cetosudeorg.wixsite.com/cetosude

Sources:

Kimaroroni village/CETOSUDE

Case uploaded:

2022-03-30

M-Kopa 600 Solar System with TV, Light







Why to choose this solution?

An M-KOPA PV system powers lights, radios, TV, and mobiles using clean, safe, and reliable solar energy. It is a package of the following: one control unit, a 24-inch flat-screen digital TV, one 30-W solar panel, one TV remote control, a TV aerial, two lights with high and low settings, and two phone-charging cables.

Savings per day or production:

M-KOPA customers enjoy many hours of kerosene-free lighting daily.

Cost in money and in own time to construct:

One 24-inch TV with a package of M-KOPA 600 costs KSH 65,499 (USD 655). A customer pays a deposit of KSh 5,49 (USD 55) and daily rate of KSh 100 (USD 1) through M-PESA Pay Bill Number 333222 for a duration of 600 days in order to fully own the product. A 24-inch TV with a package of M-KOPA 600 Zuku costs KSh 85,499 (USD 855). A customer pays a deposit of KSH 7499 (USD 75) and daily rate of KSh 130 (USD 1.3) for a duration of 600 days in order to fully own the product.

Lifetime:

Not specified.

Maintenance needed:

M-Kopa repairs or replaces the product in accordance with the warranty terms and conditions. The warranty is valid only if the product is used as instructed and is not tampered with, opened, modified, or used in other ways not authorized by M-Kopa. If the product is faulty in any way, customers return it to the nearest retail store or qualified dealer for repairs or replacement.

Resources needed in use:

Sunlight.

Problems and limits:

When customers face temporary financial challenges making their daily payments.

Where and how can you get it or make it?

M-Kopa Solar is available through hundreds of dealers in Kenya. To find the nearest dealer, contact customer care on phone or web site. The customer care team is available to support their customers, agents, and retail partners.

Skills needed to produce, install. maintenance, use:

The M-KOPAnet platform has been designed and built from the ground up by a talented team of software engineers. They are used solely in accordance with the instructions provided in the instruction manuals and must be maintained in proper repair and working condition.

How to use it:

https://youtu.be/aZjN62oFwsU

How to maintain it:

To be added.

Climate effect (if any):

Tonnes of CO2 reduced: 1.7M. It also outlines the energy efficiency gains being made in customer homes and businesses.

Why is it successful?

The vendor offers the following: Full warranty (3 years on control unit, bulbs, TV, & solar panel); Full warranty (2 years on phone-charging), cables, M-KOPA custom charges; no collateral needed; customer only needs a National ID and matching mobile money account.

If you can make it, a short description, typical problems, materials needed:

Not relevant, requires a skilled person to make it.

How to make it (if possible):

https://youtu.be/3n8NYQR_AbM (not perfect fil, just for illustration).

How is it delivered and by whom?

Installation of Mkopa 600 is done by Mkopa sales agents/ technical experts. The customers confirm/certify that the products are in good working condition upon installation. If the customer chooses to install the M-KOPA 400 or M-KOPA 400 product on his or her own without the assistance of an M-Kopa certified installer, the customer shall be liable for any negligent handling that leads to the failure of the product to perform as expected.

Successful financial model

Prepaid and pay-as-you-go models, support for development.

What policies and strategies helped the success?

The M-KOPA pay-as-you-go solar model has helped open up new consumer markets. A professional call centre helps with any problems. Upgrades and cash loans available to good payers.

More info:

http://www.m-kopa.com/

Sources:

M-KOPA Chania Avenue, Off ring-road, Kilimani, P. O. Box 51866-00100 Nairobi, Kenya. Tel: +254 707 333 222. Email: info@m-kopa.com.

Case uploaded:

2020-09-15

Polythene Liner Run-off Water Pond





Why to choose this solution?

The water pond is easy to construct and cheap compared to a metal tank. Furthermore, it serves several purposes. The water is used for irrigation, and it also helps to control soil erosion on the farm.

Savings per day or production:

It can help to save over USh 5,000 (USD 1.2), which would have been spent on buying water for irrigation.

Cost in money and in own time to construct:

The water pond costs roughly USh 1,500,000 (USD 416) to construct.

Lifetime:

3 years.

Maintenance needed:

It is needed to be covered to control water loss through evaporation. Removing the silt especially during the rainy season.

Resources needed in use:

Containers for collecting water.

Problems and limits:

The water ponds are subjected to high rates of water evaporation, water contamination and contains a lot of mineral salts making the water not suitable for washing clothes. If not marked and covered very well, there is a risk to cause accidents as well as acting as a breeding place for mosquitoes.

Where and how can you get it or make it?

JEEP constructs and trains communities in construction of water ponds.

Skills needed to produce, install. maintenance, use:

Needs a skilled person to construct. Maintenance and use needs a small introduction.

How to use it:

How to maintain it:

Climate effect (if any):

Rainwater collection can reduce flooding, soil erosion during heavy rain periods, and the stored water can be used in the dry periods. Most of the materials used in construction and use are recyclable.

Why is it successful?

If you can make it, a short description, typical problems, materials needed:

How to make it (if possible):

How is it delivered and by whom?

Successful financial model

What policies and strategies helped the success?

More info:

Sources:

Case uploaded:
2022-12-30

Roof RainWater Collection





Why to choose this solution?

Rainwater harvesting is a simple and effective tool to collect and store water for domestic and institutional use. The solution provides a cheap and easy way of collecting rainwater from the roof. Materials that can serve to construct gutters are locally available, and include bamboo, banana fibres, iron sheets, etc. Water for domestic uses such as drinking, bathing, washing, water for animals, and irrigation water is made readily available.

Savings per day or production:

Rainwater-harvesting reduces household expenditure on water in terms of time and money used to get the water. For communities that must cross significant distances to fetch water, it helps them save the time for other productive activities. Money that would have been used for buying water is also saved for other necessities.

Cost in money and in own time to construct:

Gutters from banana plantations are free of charge, bamboo guttering costs about 4,000-5,000 USh (USD 1-1.5), and metallic gutters can cost between 5000- 10,000 USh (USD 1.5- 2.9) depending on the size. A small drum for harvesting water -- around 100 liters -- costs 60,000 USh (USD 17.1). A system takes about three hours to construct and can be used immediately after construction.

Lifetime:

This gutter together with the drum can last for over 15-20 years. However, for the case of bamboo gutters insects like termites and wood borers may destroy it before that time.

Maintenance needed:

Seasoning of the wood for the case of bamboo gutters before construction is needed and regular control of insects such as termites is required. Gutters should be cleaned periodically after leaf fall. The banana fibre gutters; these can be replaced every after two weeks. Jars and other storage containers need regular cleaning inside.

Resources needed in use:

Water storage facilities like pots, tanks, etc. are required for water collection and storage. Water treatment for better quality may also be needed.

Problems and limits:

The bamboo gutter is easily susceptible to insect destructions. It may require specific species of bamboo to construct. It may also require the involvement of a carpenter. Installing the gutters on the roof also need a skilled personnel. Storage water systems are expensive such as drums and tanks making them not affordable to some households and the quality of water collected is affected by the cleanliness of the catchment surface.

Where and how can you get it or make it?

The metallic gutters can be accessed from metal fabricators. Storage containers such as pots, drums, tanks can

be bought anywhere within Uganda. People from all regions of the country use the technology to collect rainwater from the roof. Bamboo and banana fibres are available in most parts of the country.

Skills needed to produce, install. maintenance, use:

A skilled person may be required to help during the installation of the water gutter.

How to use it:

Not necessary.

How to maintain it:

Not necessary.

Climate effect (if any):

Rainwater collection can reduce flooding during heavy rain periods, and the stored water can be used in the dry periods. Most of the materials used in construction and use are recyclable.

Why is it successful?

It is successful because it is made by using locally available materials, it requires less knowledge and skills, small quantities of bamboo, banana fibres or metals are needed to set it up and it is easy to make.

If you can make it, a short description, typical problems, materials needed:

To use the technology, gutters and water storage containers are needed. Banana fibres need to be replaced every after two weeks and the bamboo or metallic gutters will need cleaning every after 6 months. Installation needs a skilled person.

How to make it (if possible):

Not necessary.

How is it delivered and by whom?

Skilled ToTs / personnel (Trainers of Trainers) who will install these gutters in the homes of those who are interested and these ToTs will charge the beneficiaries a small fee for installation of the gutters. Skilled persons / ToTs are also crucial in maintaining and ensuring the quality of the installed gutter. JEEP also promotes the technology.

Successful financial model

Support for development, training, and establishment of organised ToTs union.

What policies and strategies helped the success?

Private sector programs of ensuring increased access to water in rural communities and increased resilience to climate change and increased awareness on the benefits of rain water harvesting.

More info:

JEEP, 7 Miles, Gayaza Rd, Kyanja, Kampala, P. O. Box 4264, Uganda. https://jeepfolkecenter. org/
https://www.mwe.go.ug/sites/default/files/library/Rain%20Water%20Harvesting%20Handbook.pdf
https://www.diva-portal.org/smash/get/diva2:23019/FULLTEXT01.pdfTo

Sources:

Support for development, trainings, and establishment of organised ToTs union.

Case uploaded:

2020-12-07

Improved Shallow Wells





Why to choose this solution?

Improved shallow wells can increase access to clean water in communities.

Savings per day or production:

They are cheaper than boreholes.

Cost in money and in own time to construct:

The construction depends on water levels. With high water levels, initial investment is estimated to be 3,000,000 USh (USD 833). However, in areas where the water levels are low, it might cost around 4,000,000 USh (about USD 1111).

Lifetime:

The average lifespan is around 10 years.

Maintenance needed:

The pumps need to be maintained.

Resources needed in use:

Jerry Cans / containers for collecting water.

Problems and limits:

It needs technical personnel to construct. The time required and the construction costs of a well depend on the type, the depth needed to reach water, the volume wanted, and the density of the rock or soil. Very labor-intensive. It is more appropriate to areas with high water levels. Beyond 100 ft, it is very hard to construct. Particularly where water levels are low, changes in seasons may affect access to water.

Where and how can you get it or make it?

JEEP and other private sectors construct these shallow wells.

Skills needed to produce, install. maintenance, use:

Needs skilled personnel to install it.

How to use it:

How to maintain it:

Climate effect (if any):

During prolonged droughts, users might find less or no water because the water table goes down.

Why is it successful?

It is cheaper, providing cleaner and safer water, easy to operate, and garners support from development

funders.

If you can make it, a short description, typical problems, materials needed:

Needs a technical person to construct and maintain.

How to make it (if possible):

How is it delivered and by whom?

JEEP constructs shallow wells.

Successful financial model

Own generated funds to acquire one, or support from development partners through trainings.

What policies and strategies helped the success?

NGO programs and support from development partners.

More info:

JEEP, Tel: +256 (414) 578 316. E-mail: info@jeepfolkecenter.org https://jeepfolkecenter.org/

Sources:

JEEP, 7 Miles, Gayaza Rd, Kyanja, Kampala, P. O. Box 4264, Uganda.

Case uploaded:

2021-03-12

Improved Solar-Powered Shallow Wells





Why to choose this solution?

Solar water pumps is a socially and environmentally attractive technology to supply water. It is simple, reliable, relatively cheap, easily understood and requires low maintenance costs. Skills required to install the system are often available locally.

Savings per day or production:

Improved shallow wells help to reduce on financial bills since, it is installed once and there no monthly bills incurred. This also helps to save money in a way that the expenditures of buying gasoline and diesel to pump the water are minimised.

Cost in money and in own time to construct:

The improved shallow well requires 2-3 days to construct. It costs between USh 4,500,000 - 5,000,000 (USD 1,250-1,388) to construct.

Lifetime:

The solar water-pumping systems are designed to last for a period of about 20 years. However, some components of the system, such as the controllers, may have to be replaced within this period

Maintenance needed:

Solar energy systems require periodic inspections and routine maintenance to keep them operating efficiently. Also, from time to time, components may need repair or replacement. You should also take steps to prevent scaling, corrosion, and freezing. While you might be able to handle some of the inspections and maintenance tasks on your own, others may require a qualified technician.

Resources needed in use:

Water-storage containers.

Problems and limits:

It involves higher initial costs because it recquires a solar pump, plumbing work and tank where the water will be stored. Solar panels are popular with thieves and so need to be monitored during the day and at night. It is also necessary to avoid damaging the panels; youngsters throwing stones are a constant problem. The fact that there are in principle no running costs makes it hard to convince users to set aside money to cater for regular maintenance and repairs. These have to be conducted by experts, who are often not available at short notice. As a result, repairs are time consuming. Lower output in cloudy weather and the system must have good sun exposure between 9 AM and 3 PM.

Where and how can you get it or make it?

JEEP installs and constructs the shallow water wells and these have been installed in all regions in Uganda.

Skills needed to produce, install. maintenance, use:

Needs a technical person to manatain and install.

How to use it:

Not relevant.

How to maintain it:

Not relevant.

Climate effect (if any):

In regards to pollutants released during manufacturing, IPCC (2010) summarises literature that indicates that solar PV has a very low lifecycle cost of pollution per kiloWatt-hour (compared to other technologies). Recycling of solar panels is already economically viable. A solar-based water pump system does not result in greenhouse-gas emissions. Extensive use of solar powered water pumps would reduce greenhouse-gas emissions substantially.

Why is it successful?

It is efficient and can be operated easily with no carbon emissions. It is well known and can be used in several ways / institutions i.e hospitals, schools, households. It has greatly contributed to improved access to waters in poor rural communities. Additionally, it has contributed to improved standards of living through increased access to water. The equipment is purchased once and maintenance can be done after 3-5 years.

If you can make it, a short description, typical problems, materials needed:

Technical personnel are required for installation.

How to make it (if possible):

Not relevant.

How is it delivered and by whom?

JEEP installs them.

Successful financial model

Support from donor agencies and other development partners.

What policies and strategies helped the success?

Government programs implemented by different ministries; for example, the Ministry of Energy and Mineral Development, along with the Ministry of Water and Environment, are training communities on thebenefits of solar energy. Training and advocacy is pursued in communities to foster a positive attitude toward environmental conservation. The government, through the Ministry of Health, is encouraging promotion of solar in off-grid, peri-urban, and rural areas. Many solar subsidies and tax waivers have been put in place through the Uganda revenue authority.

More info:

Sources:

JEEP, 7 Miles, Gayaza Rd, Kyanja, Kampala, P. O. Box 4264, Uganda. Tel: +256 414 578 316. E: info@jeepfolkecenter.org https://jeepfolkecenter.org/

Case uploaded:

2021-02-04

Rainmaker Solar-Powered Water Pump





Why to choose this solution?

The Rainmaker is a portable solar-powered water-pumping system designed for small-scale farming and household use. It can lift water to a maximum height of 100 m, with a capacity of seven cubic meters per day, ensuring a steady supply of water for farming and household needs. It can provide sufficient water for up to 1.5 acres of irrigation. It can also be used for livestock and domestic household needs. The Rainmaker pumps a lot of water and does not use any fuel other than sunlight.

Savings per day or production:

Initially, users of electric water pumps used to irrigate crops had to pay an average of KSh 4,500- 5,000 (USD 45-50) in monthly electricity bills. Running the Rainmaker system now costs KSh 2,500-2,800 (USD 25-28) per month, saving about KSh 2,200 (USD 22) per month, i.e., KSh 73 (USD 0.73) per day.

Cost in money and in own time to construct:

Costs KSh 50,000 (USD 500). A survey fee of KSh 4,500 (USD 45) is charged when a field agent visits a site, of which KSh 2,000 (USD 20) is a sales analysis fee. Installation usually takes one day, and the technician conducts proper on-site training for end-users.

Lifetime:

Not specified.

Maintenance needed:

Post-installation issues such as permanently mounting solar modules of the Rainmaker pump on the roof.

Resources needed in use:

Water, and solar power.

Problems and limits:

Entry of cheaper fake and counterfeit products into the Kenyan market affects customer trust and confidence that have been built in their products so far and could have a negative impact on sales.

Where and how can you get it or make it?

In Kenya, SunCulture, a private company supplying Rainmaker systems, has its main office in Nairobi as well as sales outlets in Eldoret (Uasin Gishu County), Nakuru (Nakuru County), Mitunguu (Meru County), Mutithi (Kirinyaga County), and Matanya (Laikipia County), with more being planned to cater for growing demand. It supplies its products to all parts of Kenya, with most of their sales done through Facebook, radio, and direct enquiries made at the head office. In Africa, SunCulture has supplied solar water-pumping systems to Zambia (where there is a distributor), Uganda, Somalia, Ethiopia, Rwanda, Nigeria, Ghana and Mozambique.

Skills needed to produce, install. maintenance, use:

Production, installation, and maintenance require engineering skills. Use of the system requires training.

How to use it:

To be added.

How to maintain it:

To be added.

Climate effect (if any):

Not specified.

Why is it successful?

An important contribution to their success is that Sunculture has constantly designed and redesigned Rainmaker systems to meet farmersâ€™ needs. Rainmaker also pumps a lot of water and does not use any fuel. Can be used in several ways, e.g., for livestock and domestic household needs. The pump is suitable for many water sources including wells, boreholes, dams, and lakes.

If you can make it, a short description, typical problems, materials needed:

Materials needed include a 24V stainless-steel submersible water pump; 120-Watt portable solar modules; a 480-Watt-hour 24V waterproof battery bank paired with a Weather Smart Maximum Power Point Tracking (MPPT) charge controller in a lockable waterproof portable case; and a brass impact sprinkler with a 10-m radius.

How to make it (if possible):

Not relevant.

How is it delivered and by whom?

Installation of Rainmaker solar-powered water pumps is done by SunCulture Company, which has a dedicated team of 75 staff of which 60% are male and 40% female, based in various parts of the country. These include 16 full-time field-based technicians and 30 field-sales agents who provide installation services to the customers after conducting surveys. The field agents work in, and report to regional representatives in, three main regions, namely Western, Central, and the Coastal Area.

Successful financial model

SunCulture operations are currently supported by grant funding, by income from sales, and by strategic partnerships. Key funding partners include the Shell Foundation, USAID, and Microsoft, among others. The company has also attracted investment from international institutions such as Energy Access Ventures and Partners Group, which has enabled them to add business management, to widen their geographic reach, and to recruit sector-specific partners.

What policies and strategies helped the success?

The overall policy environment is favourable for SunCulture operations in Kenya, to which they can import all their products with ease. Imported solar irrigation systems are tax-exempt, and this favourable regulatory framework contributes to lower selling prices.

More info:

http://www.sunculture.com/

Sources:

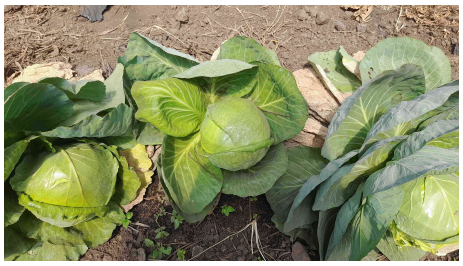
SunCulture, 236, Owashika Road, Lavington, Nairobi, Kenya. Tel.: +254 700 327 002, E-mail: info@sunculture.com

Case uploaded:

2020-08-27

Angaza Greenhouse and Drip Irrigation Farming





Why to choose this solution?

Drip irrigation is an efficient water and nutrient delivery system for growing crops. Relatively less water and manpower is required to irrigate crops. Combination of drip irrigation and greenhouse enhance water use efficiency much more. Greenhouse farming increase crop production because it is possible to create the optimal climate conditions needed for plant growth and it provides possibility to grow more plants per square meter than growing crops in an open field. It is easy to control crop pest and disease and possible to cultivate through the year. Greenhouse help to use little amount of water.

Savings per day or production:

It saves water to about 50 percent because the environment is enclosed and the efficiency of the drip irrigation system where water is directed to the plant root. Crop pest controlled when cultivating in green house, help little use of pesticides or no use at all. By doing this it means less money is spent.

Cost in money and in own time to construct:

The installation of greenhouse of 8mx30m cost Tshs 14,000,000/= The cost of installation depends on market price. Greenhouse structure can also be made from wood or bamboo but does not last long compared with those built by steel type.

Lifetime:

The greenhouse can last for 15 years old and above.

Maintenance needed:

After 5 years, repair of plastic nylon is needed.

Resources needed in use:

Resources needed include standard steel type, steel type assembly and connection, side insect proof screen netting, greenhouse plastic for roofing, Drip irrigation system, water supply (Tank tower, Tank and pipe network.

Problems and limits:

Temperature increases during dry season, leading to affect plant growth negatively. Frequently watering/irrigation can bring cooling of the plants.

Where and how can you get it or make it?

It is available at Angaza Women Centre in Tanzania promoted and installed by Balton company, Greenhouse Tanzania, etc.

Skills needed to produce, install. maintenance, use:

Installation and repair of greenhouse needs trained personnel. Training is needed to be able to construct and repair.

How to use it:

https://youtube.com/shorts/PXS5xKL30sw?feature=share

How to maintain it:

N/A

Climate effect (if any):

Agriculture is one of the main drivers of deforestation in Tanzania. Greenhouse make possible to use small area to produce large amount of produces thus eliminating the need to open new field hence reduced deforestation. The use greenhouse uses little amount of water hence it is suitable during the drought condition. Also due to climate change there is an increase of crop pest, the greenhouse can help to reduce use of pesticides contributing to reduce GHG emissions.

Why is it successful?

Amount of water required for watering plants is reduced. Enable production even in off season, normally crops produced in off season fetch good market price.

If you can make it, a short description, typical problems, materials needed:

Not applicable, needs a skilled technician

How to make it (if possible):

N/A

How is it delivered and by whom?

Main actors are the supplier of drip irrigation systems, farmers, water supply agency.

Successful financial model

The initial capital for installation/construction of greenhouse was obtained from sponsor. Korea Government funded the installation of the Greenhouse. The cost of repair/maintenance is covered by revenue generated through selling crop produce.

What policies and strategies helped the success?

National irrigation Master plan, Tanzania Agriculture policy 2013, Tanzania Horticultural Development Strategy 2012-2021.

More info:

Sources:

Angaza Women Centre (AWC), P.O Box 143, Sanyajuu - Siha, Tanzania. Email: angazawomen@yahoo.com, Telephone +255 756716798

Case uploaded:

2022-03-28

Mpunzungulu Huzi Solar Powered Drip Irrigation Mango Scheme







Why to choose this solution?

Increases in population along with rising demands for water and energy have caused stress to water and energy resources. Replacement of conventional sources of energy with renewables, and of conventional methods of irrigation with highly efficient irrigation techniques, will increase global water and energy security as well as benefit the environment. Mpunzungulu Agriculture Marketing Cooperative Society (AMCOs) is involved in small-scale commercial farming and processing of mangoes. The farm comprises 200 acres and is expected to expand to 500 acres. Diesel is the main source of energy used for pumping water from the borehole for irrigation of the mango farm. Replacement of the diesel pump with solar and use of drip irrigation will minimize water use while contributing to increased farm productivity and environmental conservation.

Savings per day or production:

Solar is an abundant source of energy and available for free. Drip irrigation uses less water without affecting the crop yield. A solar-powered water system is cost-effective over years, as it requires minimal operational and maintenance costs, unlike a diesel-powered system.

Cost in money and in own time to construct:

Cost involved in installation of the system to cover 20 acres amounts to TSh. 78,600 million equivalent to USD 34,000 (solar water pump with capacity of 18 m3/hour costs TSh. 48,300 million equivalent to USD 20,900 and the drip irrigation system costs TSh. 30,300 million equivalent to USD 13,100).

Lifetime:

The system is expected to last for a period of 3 to 5 years.

Maintenance needed:

Requires regular cleaning of the water pump. Drip plumbing requires at least annual testing, adjustment, and repairs of leaks.

Resources needed in use:

Solar radiation.

Problems and limits:

No solar power at night so there is a need for a large battery bank. High initial costs for material and installation and long return of investment.

Where and how can you get it or make it?

Sold by companies in Tanzania e.g. by Merry Water Company Limited https://www.merrywater.co.tz/, Ensol Tanzania Ltd, Davis & Shirtliff https://www.davisandshirtliff.com/tanzania-branches.

Skills needed to produce, install. maintenance, use:

It requires special skills to manufacture solar and water pump. Simple training is all that is required to maintain and use it.

How to use it:

How to maintain it:

Requires regular cleaning of the water pump. Drip plumbing requires at least annual testing, adjustment, and repairs of leaks.

Climate effect (if any):

Solar power is pollution free and causes no greenhouse gases emitted after installation. It reduced dependence on foreign oil and fossil fuels. Eliminates burning of diesel fuel to power pumps; and reduces water use.

Why is it successful?

The agricultural sector is the largest employer in Tanzania, sustaining the livelihoods of more than 70% of the population. Increasing agricultural productivity is recognised as one of the most effective ways to fight poverty and to stimulate socio-economic development. Irrigation is among the measures that can improve yields and reduce vulnerability to changing rainfall patterns, and drip irrigation delivers water specifically to plantsâ€™ root zones, resulting in vastly reduced water losses to evaporation, runoff, and off-target spray and overall lower use of water. Solar water pump has provided reliable, cost-effective and environmentally sustainable energy for the Mango farm.

If you can make it, a short description, typical problems, materials needed:

Equipment required includes solar panels and other accessories, water pump, special pipe for drip irrigation, small replacement parts such as emitters, etc.

How to make it (if possible):

How is it delivered and by whom?

Main actors include Chamwino District Council (is a government authority of the area, where the farm is located. It is responsible in provision of extension services, and assisting AMCOS to attract different investors), Mpunzungulu AMCOs (is an association of mango farmers and owners of the farm), University of Sokoine (suppliers of mango seedlings), World Resource Institute (financier of the solar powered drip irrigation system), TaTEDO (involved in installation of the system), Solar pumps companies (suppliers of solar pump and drip irrigation system).

Successful financial model

Public private Partnership and Special Purpose Vehicle.

What policies and strategies helped the success?

Tax exemption for solar panels.

More info:

Contact: Chamwino District Council, Dodoma, Tanzania.

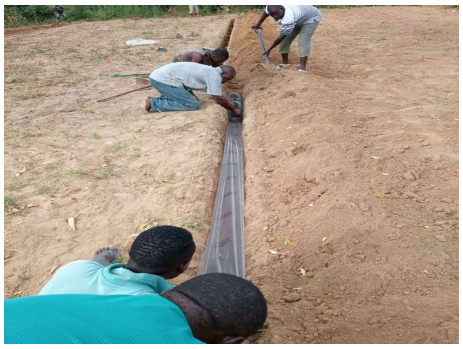
Sources:

TaTEDO, MbeziJuu, Mpakani Road, Goba, House No GOB/KZD/883, P. O. Box 32794, Dar es Salaam, Tanzania. Tel: +255 738-201498, E-mail: energy@tatedo.or.tz, http://www.tatedo.or.tz

Case uploaded:

2021-03-19

Subsurface Water Retention Technology (SWRT)





Why to choose this solution?

The technology (membrane) prevents water and nutrients lost through deep percolation in sandy soil hence increase productivity and reduce soil based poverty.

Savings per day or production:

This is a long-term technology which last for more than 50years.while comparing two plots one with SWRT and control, the SWRT plot produces five times the control

Cost in money and in own time to construct:

A plot of 10m x 10m consumes a membrane of KSH. 4000 (USD 40) plus labor. Lets assume we use 3intsallers for 2 days to complete this plot each installer to be paid KSH 500 (USD 5) per day total cost of installation will be 3 x 2 = 6x500=KSH 3000. Total installation will cost a farmer KHS 7000 (USD 70).

Lifetime:

SWRT is predicted to last more than 50 years.

Maintenance needed:

Maintain shallow cultivation with no use of ox or tractor plough.

Resources needed in use:

Polythene membrane, Jembe (Shovel), Tape measure

Problems and limits:

The technology is applicable in only sandy soils. No deep ploughing such as OX-plough and tractor plough.

Where and how can you get it or make it?

Jomo Kenyatta University of Agriculture and Technology (JKUAT) Enterprise Limited

Skills needed to produce, install. maintenance, use:

There are trained persons on membrane installation

How to use it:

https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjDsNn9tbT3AhWIyaQKHXUmD6AQwqsBegQIBBAB&url=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3D4PtlQM0z8cU&usg=AOvVaw3MnRMCXded7PyfLQlGorz0

How to maintain it:

N/A

Climate effect (if any):

Gases produced by the membrane have been collected, tested and found environmentally friendly to human beings.

Why is it successful?

Successful because the technology increases production up to 5 folds, very effective in semi- arid areas.

If you can make it, a short description, typical problems, materials needed:

You need to have the membrane which gauge .Jembe, shovel tape measure etc. installation is done by trained people.This technology is applicable to sandy farms with a depth of 1.2m. No use of ox or tractor plough.

How to make it (if possible):

https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwinhqHvuLT3AhXH5KQKHVeZCdkQwqsBegQIBBAB&url=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3DT4Ro1UmAzIs&usg=AOvVaw2ImRlNRrNArIOoee9MSAp0

How is it delivered and by whom?

Delivered by Jkuates, the International Center for Tropical Agriculture (CIAT), Saint Louis University (SLU).

Successful financial model

The technology is financed by Nordic Climate Facility (NCF).

What policies and strategies helped the success?

Established 20 trials in four villages in Makueni county, Kenya .This served as a learning point for other farmers. The project is also providing 10mÃƒâ€”10m free membrane to early adopters where they will only pay for installation cost.

More info:

JKUAT ENTERPRISE LIMITED, P.O Box 6200-00200, Nairobi, Kenya. Email jkuates@jkuates.jkuat.ac.ke, Info@jkuates.com, E: jemimahkanini6@gmail.com, Call +254724256696 +254708694592

Sources:

Visit JKUAT ENTERPRISE LIMITED

Case uploaded:

2022-04-27

Bag Gardening





Why to choose this solution?

For many urban and slum dwellers, space is limited, while for those living in areas with insufficient rain, the same is true of water. For all these growers, vertical sack gardening is emerging as a way to grow a large supply of vegetables despite water shortages and other constraints. The garden is especially suitable for growing vegetables such as kales, spinach, coriander, onions, tomatoes, okra and eggplant. Normally, when the green leafy vegetables are ready for harvest, they can be harvested 2-3 times a week and deliver strong nutritional value, containing vitamins A, C, and K that are particularly essential for growing children.

Savings per day or production:

This creative innovation is an efficient water-management venture, as the sacks are tailored to ensure that there is no water seepage or waste, thus delivering all added water to the plants. With this option, a space that can be occupied by two kale (sukuma wiki) seedlings planted the conventional way, can be occupied by one sack that can hold up to 150 seedlings, thus increasing food production 75-fold.

Cost in money and in own time to construct:

Small garden costs vary by size, location and complexity. One would spend anywhere from USD 4 to 18 per square foot after installation. Design costs run to USD 0.05 to 0.75 per square foot, or about 5% to 10% of the project cost.

Lifetime:

Grow bags are predicted to last 7 to 8 seasons, but with good care, they can last for much longer. Grow bags fabric is pressed together, not woven, which increases their durability.

Maintenance needed:

Regularly maintaining a garden involves many things including: routine care (pruning, trimming, watering); weeding. Applying either organic or inorganic fertilizers and pesticides.

Resources needed in use:

Tools include: Jembe (shovel) - to dig the soil that will be mixed with other components for constructing the garden; Forkjembe - to dig the soil in hard ground areas; Spade - to be used in collection and mixing the soil components; Tinsnip/ Knife- to cut the top part of the tin completely; Tin punch- to punch holes on the tins surfaces and the bottom; Wheelbarrow - to measure and transport the various soil parts to the recommended ratio, Perforated tins, 50 kgs sacks, gravel, clay soil, sand soil, manure, seeds and water. Purpose of various equipment: Perforated tins- to pass water through to the soil component, hold the gravel in the sack, filter dirty water, bottom tins have few holes and no holes on the bottom, second bottom tin has more holes, and third tin has more holes than the rest.

Problems and limits:

Digging, kneeling, stooping or bending over, and a variety of other repetitive movements that are all part of gardening can be harmful to your joints, to your bones, to your muscles, and can cause blisters on your hands

and possibly also on your feet.

Where and how can you get it or make it?

Smart Farm, Hela mchangani-Kangemi Nairobi.

Skills needed to produce, install. maintenance, use:

Soil analysis, composting (or worm binning), sun- exposure charting, seed germination, planter- building, diligent pest control, pollinating, tool care and maintenance.

How to use it:

https://www.youtube.com/watch?v=DduV2SGhJDU

How to maintain it:

Climate effect (if any):

The technique uses very little water, and one can use recycled water, making it economical. The method has created employment and generated income for both rural and urban dwellers, and has proved to be a good way for farmers to adapt to the effects of climate change.

Why is it successful?

Increased production per unit area (up to six fold). Efficient on time, labour and water. Provision of good agricultural nutrition, It can be accessed by all and low-land requirements (as low as 3 sq meters).

If you can make it, a short description, typical problems, materials needed:

Necessary Materials: A woven burlap or plastic bag, such as a used food-aid sack, serves as the container. Fill the bottom of the bag or sack with soil, build up, fill the bag, cut sites for plantings, transplant seedlings, plant on the top, and grow your plants.

How to make it (if possible):

How is it delivered and by whom?

Successful financial model

What policies and strategies helped the success?

The adoption of urban agriculture as a livelihood strategy, as it promotes vertical bag farms that need limited space to set up and to operate.

More info:

The Real IPM Co.(Kenya) Ltd. P.O. Box 4001-01002 Madaraka, Thika, Kenya. Tel +254 725 806086, General enquiries: info@realipm.com. Sales orders: Sales.Ke@biobestgroup.com OR sales@realipm.com

Sources:

Case uploaded:

2021-02-22

Keyhole Home Gardening





Why to choose this solution?

It can improve food security, health, and livelihoods among the communities.

Savings per day or production:

It requires locally available resources to establish. Reduces household expenditures on vegetables, i.e., for a normal family, 2000 USh (USD 1) can be saved per day. Three keyhole gardens can supply a large family with a variety of crops during a year.

Cost in money and in own time to construct:

Requires little land and investment to set up. Family/ home labour is used, and it takes like approximately 3- 5 hours to establish.

Lifetime:

3-5 years.

Maintenance needed:

It is easy to maintain. It only requires regular weeding, fertilizer application, replacing of the compost baskets, planting seeds, and harvesting produce, which is not extremely time-consuming or difficult.

Resources needed in use:

Time, knowledge/competencies, materials (seedlings, garden tools such as hoes, knives)

Problems and limits:

Construction can be somewhat effort-intensive but not cost-intensive.

Where and how can you get it or make it?

JEEP trains communities in how to establish such gardens. The garden can be established in a kitchen space, compound, or courtyard.

Skills needed to produce, install. maintenance, use:

Hands-on skills, vocational skills, home-mentored skills.

How to use it:

To be added.

How to maintain it:

Regular weeding of the garden is needed.

Climate effect (if any):

When using compost in the garden, it helps to increase carbon in soil, which reduces emissions on a small scale. Pollution from use of inorganic fertilizers is limited.

Why is it successful?

It is made through the use of locally available materials, it requires less knowledge and skill, just a small piece of land is needed, and it is easy to make. Usually built near houses, keyhole gardens enable anyone to farm easily, which is especially suitable for elderly and for physically challenged farmers. There is no need for tillage and less need for water. All forces are oriented towards achieving food security in a sustainable manner. Beneficial to the home in waste management, especially compostable kitchen waste.

If you can make it, a short description, typical problems, materials needed:

Materials: Stakes, black soil, banana fibres, kitchen waste, garden waste, manure (compost, farm yard manure, poultry litter), bricks/plastic bottles, dry mater, water, seedlings, basin, hoe, spade, etc. Problems: Knowledge and skills, materials in some communities may not be available. Procedures: Establishment needs a trained or skilled person.

How to make it (if possible):

Needs a trained person to make.

How is it delivered and by whom?

JEEP trains trainers of trainers which have been key in delivering the concept to other people in the communities.

Successful financial model

What policies and strategies helped the success?

Government programs, private-sector programs, use of trainers of trainer (ToT) approach, inclusion of vulnerable groups of people in the food-production process, and awareness-creation on the need for a sustainable food-production approach.

More info:

JEEP, 7 Miles, Gayaza Rd, Kyanja, Kampala, P. O. Box 4264, Uganda. Tel: +256 414 578 316. info@jeepfolkecenter.org

Sources:

www.jeepfolkecenter.org

Case uploaded:

2020-09-16

Kitchen Garden





Why to choose this solution?

Kitchen gardens aim to improve food security, health, and livelihoods among local communities.

Savings per day or production:

They reduce household expenditures on vegetables. An average family can save 2,000 Uganda shillings (USD 0.5) per day. Three keyhole gardens can supply a large family of 10 members with a variety of crops during a year.

Cost in money and in own time to construct:

Requires little land and investment to set up. An investment of 5000 USh (USD 1.4) is needed to establish the garden. Family/home labour is required, and it takes approximately 3-5 hours to establish.

Lifetime:

3-5 years.

Maintenance needed:

It is easy to maintain. It only requires regular weeding, fertilizer application, replacing of the compost baskets, planting seeds, and harvesting crops, which is not extremely time-consuming or difficult.

Resources needed in use:

Time, knowledge/competencies, and materials (seedlings, garden tools such as hoes, knives).

Problems and limits:

Construction can be somewhat effort intensive but not cost intensive. Setting up the garden involves many measurements and carrying of a lot of soil to make a heap (40 wheelbarrows of soil are needed to make a heap). If measurements are not accurate, the whole shape may be lost.

Where and how can you get it or make it?

JEEP trains communities in how to establish such gardens. The garden can be established in kitchen space, compound, or courtyard. It is available in Uganda mainly in the central and northern parts of the country.

Skills needed to produce, install. maintenance, use:

Hands-on skills, vocational skills, home-mentored skills. Knowledge of basic gardening: when to plant, use compost, weed and harvest; what kind of seeds to use.

How to use it:

Not relevant.

How to maintain it:

Regular weeding of the garden.

Climate effect (if any):

In the keyhole garden, farmers grow a variety of plants of which some have insect-repellent properties thus decreasing pest occurrence and also eliminating the costs of pesticides and their negative effects on the environment.

Why is it successful?

It is made through the use of locally available materials. It requires some knowledge and skills and a small piece of land. It is easy to make. Usually, they are made near houses. Keyhole gardens enable anyone to farm easily, which is especially suitable for elderly and for physically challenged farmers. There is no need for tillage and less need for water. All forces are oriented towards achieving food security in a sustainable manner.

If you can make it, a short description, typical problems, materials needed:

Materials such as stakes, black soil, banana fibres, compostable kitchen waste, garden waste, manure (compost, farmyard manure, poultry litter), bricks/ plastic bottles, dry mater, water, seedlings, basin, hoe, spade. Knowledge and skills are needed to establish. Materials may not be available in some communities.

How to make it (if possible):

Needs a skilled person to make.

How is it delivered and by whom?

Keyhole gardening is a home-based income generation activity. Delivery model is practical hands-on and participatory in nature. Business model is establishment by skilled / trained persons. The solution can be implemented individually, as a group or family who can sell the grown food stuffs to traders and directly to consumers. Trained trainers of trainers (TOTs), CSOs have got a key coordinating function in implementing the solution towards ensuring food security and improved livelihoods.

Successful financial model

Kitchen gardens are often promoted as a way to cut household costs by providing low-cost access to fruits and vegetables. Kitchen gardens are profitable, if the fair market value of garden labor is excluded from calculated costs. Local environmental conditions, gardening practices, and crop choices will influence the actual net value realized by individual gardeners.

What policies and strategies helped the success?

Government programs, private-sector programs, use of trainers of trainers (ToT) approach; support from development partners in the promotion of urban agriculture; and awareness-creation on the need for a sustainable food-production approach.

More info:

JEEP, 7 Miles, Gayaza Rd, Kyanja, Kampala, P. O. Box 4264, Uganda. Tel: +256 414 578 316.

Sources:

Email: info@jeepfolkecenter.org/ https://jeepfolkecenter.org/

Case uploaded:

2020-10-15

Vertical Gardening by Biogas International Limited Company







Why to choose this solution?

The solution helps in promoting or supporting food security since its for pure food production in vegetables, fruits, herbs plus any other food crop that can grow in it. It is easier to make, install, plant in, manage and replicate anywhere and everywhere needed. It is practical everywhere and anywhere in the rural, urban area, rocky areas, hills, flat areas and swampy areas. It is economical since it requires small piece of land to set up, its low labour intensive and less time is spent on it. It has high quantity harvest with high quality produce in a smaller area as compared to the direct ground ploughing. The technology is aimed at improving organic farming and less water usage helping in improving soil quality. The technology is part of the solid waste management since the organic wastes are used to make organic manure for nutrients replenishing.

Savings per day or production:

For the families using the technology save at least KSH 60 per day for vegetables purchase. Such amount can be saved and be used for other development purposes. It is also a source of income for many families.

Cost in money and in own time to construct:

It is less costly to set up, and cost depends on the size, its easily expandable and also less labour intensive and less time spent in setting up and maintaining them. This is because it is simply entails setting up the vertical gardens, soil and compost manure. Then filling up the garden, followed by planting, uprooting the weeds with hands and watering the plants.

Lifetime:

Over 20 years, since its a plastic of more than 0.75 mm thickness.

Maintenance needed:

The main maintenance needed is to plant, pluck the weeds and water the plants as you occasionally add compost manure.

Resources needed in use:

Vertical garden, top soil, compost manure, seedlings and source of water. With those in place you are set and ready to kick off the process of getting your harvest in a few months.

Problems and limits:

Financial constrains faced by the locals in terms of accessing the vertical gardens and seedlings and sometimes source of water can be a limiting factor.

Where and how can you get it or make it?

Available in Nairobi, at Biogas International Limited Company head office in Karen, Ngong Road, Mwitu plot 33. In Kisumu the branch office is at Dunga Beach.

Skills needed to produce, install. maintenance, use:

The skills needed are just averagely farming techniques with some organic farming skills and how to make a

compost manure.

How to use it:

How to maintain it:

Climate effect (if any):

This kind of farming is climate smart agriculture technique whereby it conserves water by consuming less water, helps to improve the green matter cover, and does not necessarily require clearing of forests and vegetation to set up, hence helps in Environmental conservation and combating climate change.

Why is it successful?

It is successful because its a source of food for many families, and those who have known the benefits plus who wants to secure food security for their families always embraces it and never wants to stop doing it with its benefits attached to their minds. it is also easier to make, install and manage, less labour intensive and time consuming makes it possible to be replicated by many.

If you can make it, a short description, typical problems, materials needed:

The materials needed are vertical gardens, soil, compost manure, seedlings, source of water and tools like Wheelbarrow and spade for installation process. After setting up the garden, the user can just install them, plant in them and maintain them easily.

How to make it (if possible):

Vertical gardening by Biogas International Limited Company.

How is it delivered and by whom?

Vertical gardening by Biogas International Limited Company

Successful financial model

What policies and strategies helped the success?

The main strategy that continues to result to its success is the strict practice of organic farming.

More info:

This kind of farming is aimed at involving all people of different genders, ages, class and categories to practice organic farming/agriculture towards attainment of food security. It also aims at extra cash earning by either saving or sales of the vegetables and produce. Also aimed at involving the urban population into agriculture.

Sources:

The source is from Biogas International Limited Company, flexibiogas technology.
https://biogas.co.ke/2019/05/03/growing-vertical-gardens/

Case uploaded:

2023-03-15

Mlango Farm





Why to choose this solution?

Mlango Farm is an agricultural sanctuary where quality and sustainable foods are grown without the use of artificial fertilizers and synthetic pesticides. It produces over 50 different crops (fruits and vegetables). This organic farming helps to eliminate pesticides and chemicals sprayed on plants contaminating the soil, water supply, and air; it reduces pollution of air, soil, food, and groundwater. It also helps reduce public health risks because the produce is rich in nutrients such as vitamin C, iron, magnesium, and phosphorus, with less exposure to nitrates and pesticide residues.

Savings per day or production:

Not specified.

Cost in money and in own time to construct:

Not specified.

Lifetime:

Mlango Farm has been operational since the year 2007.

Maintenance needed:

Weeding, watering the crops, picking of fresh produce.

Resources needed in use:

They use a farmland, compost, crop residue, labour.

Problems and limits:

Mlango Farm sits on a slope, thus incurring additional cost for construction of terraces and contours.

Where and how can you get it or make it?

Mlango Farm is situated in Ngecha village in Limuru Kenya.

Skills needed to produce, install. maintenance, use:

Agricultural (fundamentals of farming) skills are required to produce and maintain the crops.

How to use it:

To be added.

How to maintain it:

To be added.

Climate effect (if any):

Not specified.

Why is it successful?

Mlango Farm attribute their success to understanding the fundamentals of farming, which, according to them,

starts with healthy soil. They use compost, crop residue, and crop rotation to enrich the soil. The success of soil care at the farm is evident through the quality of their produce. Many of their customers can attest to the tastiness of their produce.

If you can make it, a short description, typical problems, materials needed:

Requires farm land, fruit trees, vegetables, and compost.

How to make it (if possible):

Not relevant.

How is it delivered and by whom?

Mlango Farm delivers fresh vegetables to hotels and restaurants in Nairobi and its environs, including farm-share baskets with a variety of vegetables to individuals. Every week they deliver baskets with a variety of vegetables at pickup points, they bring the vegetables to a pickup point in the morning, from which customers can pick up their basket during that day or at whichever time is convenient to them. Customers can sign up for only 950 Ksh per week on http://www.mlango.org/img/signup.pdf and send an email to: baskets@mlango.org. One basket is enough for 4 or 5 meals.

Successful financial model

Collaboration with agricultural experts, Learning from online resources ie Google since the Kamande Njenga and his wife Els Breet both did not have a background in agriculture when they started the farm. Mlango farm foundation aiming to provide children and youth (regardless of socio-economic background) encouraging practical and experimental learning through farm visits for all ages.

What policies and strategies helped the success?

Certification by Encert in 2010. Farm tours at a cost of 1,500 KSh (USD 15) per person (half price for children, and kids under the age of 3 are free).

More info:

http://www.mlango.org/

Sources:

Mlango farm, Limuru Rd, Nairobi. Tel: 0728 848296. E-mail: info@mlango.org

Case uploaded:

2020-09-22

Vertical Gardening by Biogas International Limited Company







Why to choose this solution?

The solution helps in promoting or supporting food security since its for pure food production in vegetables, fruits, herbs plus any other food crop that can grow in it. It is easier to make, install, plant in, manage and replicate anywhere and everywhere needed. It is practical everywhere and anywhere in the rural, urban area, rocky areas, hills, flat areas and swampy areas. It is economical since it requires small piece of land to set up, its low labour intensive and less time is spent on it. It has high quantity harvest with high quality produce in a smaller area as compared to the direct ground ploughing. The technology is aimed at improving organic farming and less water usage helping in improving soil quality. The technology is part of the solid waste management since the organic wastes are used to make organic manure for nutrients replenishing.

Savings per day or production:

For the families using the technology save at least KSH 60 per day for vegetables purchase. Such amount can be saved and be used for other development purposes. It is also a source of income for many families.

Cost in money and in own time to construct:

It is less costly to set up, and cost depends on the size, its easily expandable and also less labour intensive and less time spent in setting up and maintaining them. This is because it is simply entails setting up the vertical gardens, soil and compost manure. Then filling up the garden, followed by planting, uprooting the weeds with hands and watering the plants.

Lifetime:

Over 20 years, since its a plastic of more than 0.75 mm thickness.

Maintenance needed:

The main maintenance needed is to plant, pluck the weeds and water the plants as you occasionally add compost manure.

Resources needed in use:

Vertical garden, top soil, compost manure, seedlings and source of water. With those in place you are set and ready to kick off the process of getting your harvest in a few months.

Problems and limits:

Financial constrains faced by the locals in terms of accessing the vertical gardens and seedlings and sometimes source of water can be a limiting factor.

Where and how can you get it or make it?

Available in Nairobi, at Biogas International Limited Company head office in Karen, Ngong Road, Mwitu plot 33. In Kisumu the branch office is at Dunga Beach.

Skills needed to produce, install. maintenance, use:

The skills needed are just averagely farming techniques with some organic farming skills and how to make a

compost manure.

How to use it:

How to maintain it:

Climate effect (if any):

This kind of farming is climate smart agriculture technique whereby it conserves water by consuming less water, helps to improve the green matter cover, and does not necessarily require clearing of forests and vegetation to set up, hence helps in Environmental conservation and combating climate change.

Why is it successful?

It is successful because its a source of food for many families, and those who have known the benefits plus who wants to secure food security for their families always embraces it and never wants to stop doing it with its benefits attached to their minds. it is also easier to make, install and manage, less labour intensive and time consuming makes it possible to be replicated by many.

If you can make it, a short description, typical problems, materials needed:

The materials needed are vertical gardens, soil, compost manure, seedlings, source of water and tools like Wheelbarrow and spade for installation process. After setting up the garden, the user can just install them, plant in them and maintain them easily.

How to make it (if possible):

Vertical gardening by Biogas International Limited Company.

How is it delivered and by whom?

Vertical gardening by Biogas International Limited Company

Successful financial model

What policies and strategies helped the success?

The main strategy that continues to result to its success is the strict practice of organic farming.

More info:

This kind of farming is aimed at involving all people of different genders, ages, class and categories to practice organic farming/agriculture towards attainment of food security. It also aims at extra cash earning by either saving or sales of the vegetables and produce. Also aimed at involving the urban population into agriculture.

Sources:

The source is from Biogas International Limited Company, flexibiogas technology.
https://biogas.co.ke/2019/05/03/growing-vertical-gardens/

Case uploaded:

2023-03-15

Ficus Natalensis Agroforestry systems







Why to choose this solution?

Tree is grown as a live fence around homes and at a wide spacing for shade and soil rejunevation in coffee, cocoa and banana plantations, as it drops leaves which quickly decay to provide both soil cover and manure. Throughout Uganda, barkcloth is made from this tree which can be used domestically or sold to supplement household income. Leaves are used to treat dysentry and sore throats. Other uses: Pruned branches are used as fuel wood when dry and as fodder for livestock, and also act as windbreaks.

Savings per day or production:

Any annual or perennial crop can be inter-cropped with Ficus spp. provided the tree canopy is managed well.

Cost in money and in own time to construct:

The most important factor affecting cost is labor to transport the bulky stem cuttings to the site. However, Ficus natalensis is easy to establish and is durable (over 100 years) depending on management.

Lifetime:

Ficus Natalensis is propagated using cuttings from young branches which are planted vertically 6m apart along a contour. The tree is quite robust and can attain heights of over 20m, with a very extensive canopy if left to grow unchecked.

Maintenance needed:

Pruning raises its canopy to the desired height above the ground. Fencing is required to protect the tree from damage by livestock in early stages. Within 12 to 18 months, the tree is established enough to withstand browsing (WOCAT, 2014). Implementation of the technology on steep slopes(> 50%) not possible without other supportive Sustainable Land Management interventions including construction of stone lines and mulch application.

Resources needed in use:

A Ficus tree can live for a hundred years.

Problems and limits:

Scarcity of fuel wood may lead to over-harvesting of branches, destroying the canopy. Nonetheless, the tree regenerates quickly with the coming of the rains.

Where and how can you get it or make it?

Ficus Natalensis is propagated using cuttings from young branches which are planted vertically 6m apart. Propagation material (large cuttings and seedlings) is readily available and cheap, making the technology inexpensive to establish. It is cultivated in all regions of Uganda.

Skills needed to produce, install. maintenance, use:

Simple farming knowledge and skills. A wide strip of bark is removed in one piece, then softened with steam. An 18-inch-wide strip of bark can be beaten with a mallet into pieces of cloth over seven feet wide. One tree

could yield 40 bark strippings (AB Katende et. al., 1995).

How to use it:

Barkcloth Making in Uganda: https://www.youtube.com/watch?v=uhznFtHhkBo

How to maintain it:

Maintenance is by simple agronomic practices like weeding when still young. Care should be taken no to harm the skin if the aim is to get good quality bark-cloth. When the canopy grows so thick and heavy it may be good to reduce because a very heavy canopy can result to getting the tree uprooted during storms.

Climate effect (if any):

Why is it successful?

Propagation material is readily available and cheap, making the technology inexpensive to establish.

If you can make it, a short description, typical problems, materials needed:

How to make it (if possible):

How is it delivered and by whom?

Successful financial model

What policies and strategies helped the success?

The National Forestry and Tree Planting Act (2003) that recognizes indigenous knowledge in forest conservation, in line with the Convention on Biodiversity.

More info:

AB Katende et. al, (1995). Useful Trees and Shrubs for Uganda. Regional Soil Conservation Unit. WOCAT (2014). Ficus Natalensis Agroforestry System.

Sources:

http://www.fao.org/3/au287e/au287e.pdf

Case uploaded:

2021-03-16

Soap and Lotion Making from Natural Tree Oils







Why to choose this solution?

Trees such as shear nut tree, Eucalyptus tree, coconut tree and palm trees provide natural oils, which can be used for making soaps (laundry, bathing and liquid soap), Vaseline cream, lotions, and body creams. Using these natural oils have also health benefits to treating skin disorders, certain diseases, and repelling mosquitos. Soap making plays a big role in environment conservation because efforts are now being made to conserve these trees, from which the oil can extracted and be used to generate income. It can also be a good activity for small case business of a Village Savings and Loans Associations (VSLA). Good for both children and adults.

Savings per day or production:

Using soap reduces household expenditures on soap because for an average family a bar can be used for three weeks compared to other ordinary soap which lasts for about two weeks.

Cost in money and in own time to construct:

It requires little investment to start. One may need approximately USD 57 (USh 200,000) as start-up capital to start making soap for a small business. The soap making process takes 45 minutes, after which the soaps need three weeks to get dried. Then you can package and label them. The different products from natural oils costs between USh 2,000 - 50,000 (USD 0.54-14).

Lifetime:

The soap can last for over 3 years since it is made out of natural tree oils and no preservatives are added.

Maintenance needed:

Needs be stored in a cool dry place.

Resources needed in use:

Buckets / basins and water.

Problems and limits:

Inhalation of caustic soda fumes during the soap making process can be dangerous to human health. Therefore, it is necessary to use masks or scarf and gloves during the soap making.

Where and how can you get it or make it?

In Uganda, JEEP is making soap and JEEP also trains communities in soap production.

Skills needed to produce, install. maintenance, use:

The ingredients are shea butter, coconut oils, caustic soda, water, and herbs like Aloe Vera, rosemary, pawpaw leaves. Equipment needed are measuring weight, bowls and a spoon to mix and heat, and molding trays. About 5 liter plant oil makes 45 soap bar weighing 120 grammes.

How to use it:

How to maintain it:

Climate effect (if any):

It is environment friendly and it is playing a big part in environment conservation because efforts are now being made to conserve the trees where the oils come from.

Why is it successful?

It is successful because it requires small investment to start and materials are locally available from indigenous trees in Uganda. Additionally, soap is on a high demand everywhere in the world. It is also a good activity for a small scale business, and as a Village Savings and Loans Association activity.

If you can make it, a short description, typical problems, materials needed:

How to make it (if possible):

https://www.youtube.com/watch?v=zRSxDWfIkhA&ab_channel=JointEnergyandEnvironmentProjects

How is it delivered and by whom?

Business model is production by skilled persons with a few employees that sell to traders, shops, markets and directly to. Trained small organised groups can help to maintain quality. JEEP has supported and coordinated organising and training such groups in rural and urban centres.

Successful financial model

Support for development, training of small organised groups in soap making and branding with labelling.

What policies and strategies helped the success?

Government efforts to conserve the trees from which natural oils come from. Subsidising prices so as it is affordable to many people. Advertising it by emphasizing that it is made from natural tree oils, educating people about the health benefits and encouraging people to take it on as a VSLA activity.

More info:

https://www.youtube.com/channel/UCNu_MEIXjnCWqDXjuCD6yQg and
https://www.youtube.com/watch?v=oufmoZuMqVU

Sources:

JEEP, 7 Miles, Gayaza Rd, Kyanja, Kampala, P. O. Box 4264, Uganda. Phone: +256 (414) 578 316. E-mail: info@jeepfolkecenter.org, Web: https://jeepfolkecenter.org/

Case uploaded:

2020-10-06

Donkeys for transportation





Why to choose this solution?

Donkeys are used for both commercial and domestic purposes, transporting goods and people in rural, urban, and peri-urban areas. They contribute significantly to both the national economy and household livelihood support. The reason why donkeys are so important for many communities in Kenya is that they are adapted and resilient in the different environments ranging from wet, cold and mountainous conditions to dry, hot and semi-arid areas with harsh climatic conditions. They are inexpensive means of transport to wide range of commodities including water, agricultural produce, garbage,firewwod, household items etc.

Savings per day or production:

Donkeys save the women from using their little finances that would have been used in sourcing for alternative transport such as bicycle, motorcycle, or vehicle. The savings are used to cater for other household requirements, mainly food.

Cost in money and in own time to construct:

The average price of an adult donkey costs about Kenya Shillings 13,000 (130 USD)

Lifetime:

A healthy donkey has a lifespan of about 27-40 years

Maintenance needed:

Donkeys should be fed well and once in a while have checked by a veterinary officer. They should be housed in shelters that protect them from harsh weather and vaccinated against rabies annually and dewormed every three months.

Resources needed in use:

Donkeys can either work as draught animals where they pull a cart or a plough, or alternatively a load is placed directly on their backs.

Problems and limits:

There is an increase in global demand for donkey meat and skin resulting to massive slaughtering and theft of these animals from most donkey owning communities in Kenya.The implications of this commercial donkey slaughter in Kenya where 5.1 per cent (301,977 donkeys) of the total population was wiped out by the slaughterhouses alone during the period 2016-2018. Lack of proper policies on donkeys may also diminish their population in Kenya.

Where and how can you get it or make it?

Donkeys are available across Kenya with larger number of its population drawn from high agricultural potential counties like Kiambu, Kirinyaga and Nyandarua. Donkeys are purchased in various markets.

Skills needed to produce, install. maintenance, use:

Skills needed to maintain and use donkeys are simple; The animals should be fed well and once in a while

checked by a vet. donkeys should be housed in shelters that protect them from harsh weather.They should be vaccinated against rabies annually and dewormed every three months.There is no actual skills in using donkeys; The work simply entails loading, directing donkeys as well as unloading cargo from the cart or donkeys back by the user.

How to use it:

https://youtu.be/HTx8SwNul_c (copyright (2018) KTN News Kenya)

How to maintain it:

Not relevant

Climate effect (if any):

The use of donkeys for transport avoids the burning of fossil fuels like gasoline and diesel from other means of transport like vehicles which release carbon dioxide, a greenhouse gas, into the atmosphere.

Why is it successful?

Donkeys are a cheaper means of transport compared to vehicle pick-ups and have capacity to ferry a considerable quantity of goods. They enhance accessibility to hard-to-reach areas;They access with ease the earth roads during rainy seasons, foot paths and marshy areas which cannot not be accessed using other means of transport such as cars and motorbikes.

If you can make it, a short description, typical problems, materials needed:

Not relevant

How to make it (if possible):

Not relevant

How is it delivered and by whom?

Donkeys are sold and purchased at various markets, after which the owners take them home by themselves.

Successful financial model

What policies and strategies helped the success?

The Kenyan government imposed a ban on the slaughter of donkeys in 2020 to control the unprecedented and unsustainable demand for Donkey skins in kenya,but was later lifted by the High Court in 2021. In Kenya, the donkey was gazetted as a food animal in the year 1999 (GoK, 1999) with the aim of curbing backyard slaughter, improving food safety and stimulating donkey production in response to market availability. An increase in global demand for donkey meat and skin led to establishment and licensing of four donkey slaughterhouses.The export donkey slaughterhouses were established, licensed and operationalized within the period 2016 and 2018.

More info:

https://www.standardmedia.co.ke/business/opinion/article/2001376330/why-rural-kenyan-communities-rely-on-donkey-for-daily-economic-activities

Sources:

https://www.standardmedia.co.ke/business/opinion/article/2001376330/why-rural-kenyan-communities-rely-on-donkey-for-daily-economic-activities
https://www.standardmedia.co.ke/business/enterprise/article/2001260297/so-you-want-to-start-a-donkey-transport-business photo 1(cc, the star) 2(cc istock) 3(cc voanews)

Case uploaded:

2022-03-16

Using Oxen for Farming





Why to choose this solution?

Savings per day or production:

The solution contributes to saving money that would have been spent on labour. Two oxen, operated by two people, on average can plough an acre per day which would take at least 25 people to perform the same task. There is also saving on time which enables timely sowing.

Cost in money and in own time to construct:

One has to buy or breed two animals (usually bulls) and will require an ox-plough set. The animals need to be acquired when still young so the cost is comparatively low at the time of acquiring e.g. about USD 120, depending on area, then the ox-plough costs about USD 15. One may need to consider the costs involved in caring and training the animals until they are ready to start farming.

Lifetime:

Depending on the care provided by the owner (this includes avoiding overworking the animals), the pair may remain productive for over 5 years.

Maintenance needed:

The animals need to be well fed, treated well in case of any ailments and not overworked. The ox-plough itself requires minor maintenance and replacements of parts that may break.

Resources needed in use:

Problems and limits:

Both the animals and operators need to be trained. Also being living things the animals may be prone to disease, accidents etc.

Where and how can you get it or make it?

The animals can be bred by the farmer himself or bought from other farmers. The ox-plough are readily available in local markets and shops in areas where ox-ploughing is practiced.

Skills needed to produce, install. maintenance, use:

Both the animals and operators need to be trained.

How to use it:

How to maintain it:

Climate effect (if any):

No outstanding climate effect attributable, but is safer to the environment compared to the tractor because of lesser emissions.

Why is it successful?

It is woven in the cultural fibre of the people where it is practiced. It saves a lot on man-power and time used for ploughing and sowing.

If you can make it, a short description, typical problems, materials needed:

How to make it (if possible):

How is it delivered and by whom?

Successful financial model

Two main models exist: Farmers who own oxen and ploughing set. They use the oxen to plough their gardens, then they are also hired to plough their neighbours gardens. The second model is where the person operates the oxen purely for business being hired to plough other peoples gardens and farms.

What policies and strategies helped the success?

More info:

Sources:

Case uploaded:

2022-12-30

Electric 3-Wheeler, E-Bike, E-Motorbike, E-BodaBoda







Why to choose this solution?

Electric vehicles have a lot of advantages compared to combustion engine vehicles; they are cheaper, do not pollute the air hence reducing public health spending, and are more comfortable as they are less noisy. The e-vehicles have rechargeable battery, which can be charged at night at home.

Savings per day or production:

E-vehicles are less expensive for fuel and maintenance compared to combastion engine vehicles. The cost of fuel is reduced by 70%, as electricity is cheaper than petrol and diesel. The maintenance cost is minimal as e-vehicles need less maintenance.

Cost in money and in own time to construct:

The electrical vehicles can be constructed in different sizes from two-, three- to four-wheelers and for different purposes like private use, and commercial cargo uses. Its cost depends on size, capacity and use from USD 660 to 6,260.

Lifetime:

Depends on handling or how properly used and maintained by the user.

Maintenance needed:

There is no need of regular technical services. There is only need of proper handling by the user.

Resources needed in use:

Electric Vehicles (EVs) use electricity from the battery storage charged by normal electric supply.

Problems and limits:

Currently, the available electric 3/2 wheelers like tuk-tuks, boda-bodas, and e-scooters are limited by lack of convenient and affordable charging facilities, as well as standardization of chargers and batteries. Policies and regulations are major barriers to accelerating the e-mobilty adoption. The production facilities are still in small scale, but it is growing rapidly. This will create jobs, and will bring the price down.

Where and how can you get it or make it?

Available as being imported from China and India and by being retrofitted. There are companies started assembling and producing them.

Skills needed to produce, install. maintenance, use:

Assembling and retrofitting of electric three-wheelers/EVs require skilled and experienced engineers (electrical & mechanical engineer, electromechanical engineers). Major repair and maintenance require skilled technicians otherwise trained operators may do minor maintenance of the vehicle.

How to use it:

Training is required from Vocational Education and Training Authority (VETA) or from any other recognized institution.

How to maintain it:

Major repair and maintenance require skilled technicians otherwise trained operators may do minor maintenance of the vehicle.

Climate effect (if any):

Contribute to reducing greenhouse gas (GHG) emission from fossil fuels vehicles (petrol & diesel vehicles), which increase the global warming effects that has a high impact on the country and socio-economic factors such as human health, poverty, low agricultural production, etc. The transport sector globally contributes one-quarter of all energy-related emitted greenhouse gases, which is expected to reach to one-third by 2050. Fuel demand by the transport sector is expected to increase rapidly due to urbanization and economic growth which also worsens global climate change.

Why is it successful?

The electric three-wheelers are very efficient and can be operated easily with no carbon emissions as they are charged by electricity, or minigrids, which is produced by renewable energy. It has a great contribution to the improvement of air quality through the reduction of greenhouse gas (GHG) emissions associated with fossil fuel transportation. Also, the prices of electric three-wheelers and operational costs are affordable by the majority.

If you can make it, a short description, typical problems, materials needed:

E-mobility is currently considered as the best solution for the environment in terms of public and personal transportation for better air quality, combating climate change, and economic relief compared to fossil-fueled mobility. In Africa, there is an increasing demand, and several assemblying facilities are has started. The electric mobility/vehicles are imported as components, and the assembling requires trained technical personnel and engineers. For the part of retrofitting, some of the spares are also imported. The spares/components/materials needed include an electric motor (DC motor), motor controller, cell unit (chargeable battery), charger system, and charging infrastructures, the other parts remain the same as other fossil-fueled vehicles.

How to make it (if possible):

Electric vehicle manufactured in factories and special engineering knowledge is required.

How is it delivered and by whom?

Successful financial model

UN-Habitat is financing and facilitating the development of pilot projects introducing electric vehicles. There are also examples of facilitating to rent the battery or get a loan to buy a vehicle, like a partnership of Roam Air with M-Kopa in Kenya.

What policies and strategies helped the success?

In Tanzania, the Climate Mitigation Strategy-2012 promotes fuel switching in transport systems and low-emission transport via mass rapid transport systems.

More info:

In Tanzania: E-motion https://e-motion.africa/ and eMo BodaBoda https://www.emobodaboda.co.tz/ ; In Kenya: ROAM AIR https://www.roam-electric.com/ Kibo Bike https://kibo.bike/ ; In Uganda: BodaWerk https://bodawerk.com/mobility/ UNFCCC: https://unfccc.int/news/advancing-electric-mobility-in-africa UNEP: https://www.unep.org/explore-topics/transport/what-we-do/global-electric-mobility-programme and ICI:
https://www.international-climate-initiative.com/en/iki-media/news/electric_2_and_3_wheelers_in_east_africa_and_southeast_asia/

Sources:

Case uploaded:
2022-12-30

Electric Bicycles - Bicycles Helped with a Motor





Why to choose this solution?

Electric bicycles offer a mobility which is in between bicycles and motorbikes. Changing from combustion engine motorcycles, you reduce the CO2 emission, air pollution, and noise. Compared to a normal bike, the electric motor helps you to drive faster and longer, and the rechargeable battery can be charged at night at home and at other electric outlets. For times or places without electricity to recharge, it is still possible to drive the bike by man power, as a normal bike.

Savings per day or production:

The cost of fuel is reduced by at least 70% compared to combustion engine motorbikes as electricity is cheaper than petrol and diesel.

Cost in money and in own time to construct:

The prices differ according to models for usages like private, cargo, re-used or new, from USD 400 to 1000. They can ride from 40 to 80 km by one charge with up to 25 km/h carrying 120 kg. A model driving 80 km in one charge costs USD 765 in Kenya.

Lifetime:

Bicycles itself last 10-20+ years. The battery lasts about 5 years, when it needs to be changed or you can continue use the bike without motor.

Maintenance needed:

It needs normal maintenance for bikes. You can adjust, how much the battery helps, from 25% to 100%. It is faster than normal bikes, so brakes need to be regularly checked, and helmet is need to be used. When there is no more power in the battery, you need to recharge it, if you want the motor to help.

Resources needed in use:

Electric bikes are normal bikes, which need the user to pedal for it to ride and has a motor helping to ride faster and up hill. Man power is always required and if you need the motor to help, the electricity is from the battery, which can be charged by normal electric plug.

Problems and limits:

The starter price is higher compared to a normal bike, but cheaper than a motorbike. The battery has a limitation of how many km it can power to ride depending on the models, and how much the motor is used. The battery is expensive to change after the 5 years.

Where and how can you get it or make it?

The electric bikes are available in shops and e-bike companies, which are importing, manufacturing or assembling them. There are companies, which convert bikes to electric bikes by attaching motor and battery. There are programs, and associations promoting bicycles and e-bicycles for community use by donating, renting or for reduced price.

Skills needed to produce, install. maintenance, use:

How to use it:

How to maintain it:

Climate effect (if any):

Using e-bikes reduces greenhouse gas emissions compared to fossil fuel vehicles.

Why is it successful?

It is succesful because it is a smart and cheap way of transportation. Cheap because it does not need fuels just energy from the battery, and in times of lack of energy, you can just use the pedals as a normal bike.

If you can make it, a short description, typical problems, materials needed:

How to make it (if possible):

How is it delivered and by whom?

Successful financial model

Loan, renting or leasing. Battery can be owned by a company with charging stations. Companies using it to employees delivering goods brings savings, and good image. Support and donations to community use as waste collection, water carriage for women, ambulance, and school children during school period, which is increasing school attendance.

What policies and strategies helped the success?

More info:

First African Bicycle Information Organization (FABIO), AfricroozEs bikes: https://fabio.or.ug/; eBee: https://ebee.africa/ and African Ebike: https://african-ebike.de/en/

Sources:

Case uploaded:

2022-12-01

Bicycles in Tanzania





Why to choose this solution?

Bicycles are used for productive activities, transporting both people and goods. Cycling is a cheap mode of transport, certainly when compared with traveling by car or by any motor vehicle. It is faster than walking and is not easily impeded by traffic jams. A large percentage of cycling also supports income-generating activities in Tanzania.

Savings per day or production:

Reduction of transport-related expenses, including time requirements, benefiting households as well as small businesses that use bicycles.

Cost in money and in own time to construct:

New and used bicycles are available from many shops all over the country. Depending on condition, their prices range from TSh 150,000 to 300,000. A bicycle can last for five years or more, depending on usage, handling, and maintenance by its user(s).

Lifetime:

Depending on handling and maintenance by the user and frequency of use, bicycle can last for more than 5 years.

Maintenance needed:

Cleaning, lubrication, protection from the elements, and repair of small damages will keep it in working order for years. Requires some training or relevant experience, simple materials, and small tools.

Resources needed in use:

Bicycles run on metabolic â€œhuman powerâ€•. New in the bicycles market are the e-bikes, which are mechanically boosted, so it can partially power the bicycle through a battery.

Problems and limits:

Exposure to road accidents is high, especially in crowded and heavy traffic areas, given the lack of dedicated lanes for cyclists. Bicycles are less comfortable than vehicles.

Where and how can you get it or make it?

Available in many regions and shops in Tanzania. Requires training or applicable experience, tools, and supplies to assemble correctly.

Skills needed to produce, install. maintenance, use:

Simple but specific training is required to use, and repair bicycles that are safe to ride. Do-It-Yourself guides for simple repairs and maintenance include those found at https://www.bicycling.com/repair/

How to use it:

https://www.youtube.com/watch?v=74csHhg5WAQ

How to maintain it:

Simple but specific training is required to use, and repair bicycles that are safe to ride. Do-It-Yourself guides for simple repairs and maintenance.

Climate effect (if any):

Transport, largely fossil-fuelled, is the third-largest source of CO2 emissions. Bicycles produce zero carbon emissions. Further, bicycles donâ€™t chew up the roads as motorized vehicles do. They are a far more sustainable technology, as it takes much less energy, along with fewer and less toxic materials, to make a bicycle than it does to manufacture any motor vehicle.

Why is it successful?

Bicycles have many benefits, including pollution and CO2-emission reductions as well as ease of maneuvering and operation. Of all transport other than walking, they incur the lowest costs in maintenance. Daily or regular bicycle-riding usually has positive effects on ridersâ€™ fitness. Cycling functions even with little or no upgraded infrastructure, and bicycles do not occupy large parking spaces.

If you can make it, a short description, typical problems, materials needed:

How to make it (if possible):

How is it delivered and by whom?

Supply is demand-driven. There are many suppliers, distributors, and agents all over Tanzania. MeTL Groupâ€™s National Bicycle Company (NABICO) is a major manufacturer and assembler of bicycles in Tanzania. Also, there are several clubs for cyclists in the country.

Successful financial model

Prices of bicycles (new or used) and operational costs are affordable by the majority.

What policies and strategies helped the success?

Tanzaniaâ€™s transport policy include bicycles. Bicycles do not need a road license, there are no road penalties for cyclists, etc. In addition, bicycle shops are located throughout the country, facilitating access.

More info:

https://www.poverty.ch/measuring-the-impact-of-bicycles-in-tanzania/ , https://www.youtube.com/user/WorldBicycleRelief , https://onebiketz.com/ , http://www.bikeinafrica.com/ (English & French), especially â€œLoving Tanzaniaâ€• by bike. https://www.bicycling.com/repair/. YouTube Channel for â€œAfricaâ€™s Cycling Revolutionâ€• (English): https://www.youtube.com/c/Olympics/search?query=africa%27s%20cycling%20revolution

Sources:

Case uploaded:

2021-03-12

Bicycles in Uganda





Why to choose this solution?

Bicycles are the principal means of transportation in many regions of the Republic of Uganda. They also provide a popular form of recreation, and have been adapted for use as toys for children, general fitness, military and police applications, courier services, bicycle racing, and bicycle stunts. The bicycle is a simple, affordable, reliable, clean and environmentally sustainable means of transportation. It serves as a tool for development and as a means not just of transportation but of access to education, health care, and sport. The synergy between the bicycle and the user fosters creativity and social engagement. It gives the user an immediate awareness of the local environment. This humble symbol of sustainable transportation conveys a positive message to foster more sustainable consumption and production. It has a positive impact on climate.

Savings per day or production:

Bicycle-riding avoids fossil-fueled transport and, thus, reduces carbon emissions and decreases the need for more roadways. Insofar as it replaces driving, it reduces landfill waste. An astonishing 75% of the parts of a bicycle are recyclable. Bicycle use improves air quality because it is a zero -emissions way to get from place to place. It also can help protect wildlife. Bicycling can reduce stress, improve respiratory health, maintain strength and balance, and effectively reduce healthcare expenses. It can reduce or eliminate expenditures on daily transportation, car insurance, and parking.

Cost in money and in own time to construct:

A bicycle costs about USh 250,000-500,000 (USD 71.4- 142). However, the price depends on the size, and purpose of the bicycle.

Lifetime:

About 15 years, but the lifetime depends on the how the owner handles it through maintenance.

Maintenance needed:

Keep the bicycle clean by washing it regularly. The drive train should be kept clean and well lubed. A chain cleaner tool will make chain cleaning much easier. Check the tire pressure always and ensure nuts and bolts are tight. Brakes should be checked regularly, index the gears. Replace components damaged by excessive wear and tear.

Resources needed in use:

Knowledge on how to ride.

Problems and limits:

Bicycles are slower compared to other means of transport. Bicycles are also weather sensitive as a rider is not protected from rain, sunshine and dust. Bicycle seats are not comfortable compared to other means of transport. Riding for long time is tiring, and sometime ends up causing wrist and back pain. Bicycles are not easily traced once stolen. Flat tires, inability to carry much cargo, challenges of route and traffic and fear of the unknown are potential impediments.

Where and how can you get it or make it?

They can be accessed through bicycle houses, bicycle shops, bicycle garages in Uganda. Bicycles sometimes may be bought second hand from individuals who no longer need it.

Skills needed to produce, install. maintenance, use:

Production requires skilled personnel. Use of the bicycle requires a physical ability to ride it.

How to use it:

Not relevant.

How to maintain it:

Bicycle parts should be kept clean and properly lubricated for good performance.

Climate effect (if any):

Bicycles are environmentally friendly since they do not emit any carbon in the atmosphere like fossil-fueled means of transport. Use of bicycles (and walking) are the only ways to cut carbon emissions in urban transportation.

Why is it successful?

Apart from walking, bicycles are the cheapest means of transportation and are the most environmentally friendly forms of transportation. Riding a bicycle is a physical task that can also serve as healthy exercise.

If you can make it, a short description, typical problems, materials needed:

Production needs skilled personnel and to use the bicycle it needs knowledge on how to ride it.

How to make it (if possible):

Not relevant.

How is it delivered and by whom?

Bicycle models are advertised by shops and by manufacturers. Sales and discounts may be offered by the bicycle house or shops.

Successful financial model

Offering retail sales of new bicycles. Offering discounts for wholesalers. Sale promotions, especially during celebrations.

What policies and strategies helped the success?

The government has stopped overlooking the bicycle in its policies, budgeting, taxing and other major activities. The private sector has also been innovative by pushing the government to remove taxes. The civil society has also raised its voice and pushed governments, as well as private sector actors and users to greater and more efficient use of bicycles.

More info:

http://www.jugendhilfe-ostafrika.de/wp-content/uploads/2011/12/Overview-bicycles-Uganda.pdf

Sources:

http://wedocs.unep.org/bitstream/handle/20.500.11822/25414/uganda_nmtpolicy.pdf?sequence=1&isAllowed=y

Case uploaded:

2020-10-15

Buffalo Bicycles in Kenya





Why to choose this solution?

Providing bicycles to the students through Plan International helps improve pupilsâ€™ academic performances, since time saved in travel to and from school will be taken to study after arriving early and the ability to depart later if needed. The bicycles are a clean and environmentally sustainable means of transportation which gives their users ease and independence of mobility. They have been seen to increase student retention rates, especially among those who otherwise would drop out of school due to teen pregnancies.

Savings per day or production:

Saves travel time spent by students who otherwise must walk long distances to and from school. Providing a quality, durable bicycle to improve access to education is both simple and a more cost-effective way to improve childrenâ€™s education than constructing more schools or implementing dedicated bus or taxi services.

Cost in money and in own time to construct:

The bicycles were donated by Plan International Kenya in partnership with World Bicycle Relief through the organization of the Bicycle Education Empowerment Program (BEEP).

Lifetime:

About 15 years with proper maintenance.

Maintenance needed:

Community members have been trained as bicycle mechanics to repair and maintain bicycles. Parents whose children have benefitted from the program, have the responsibility to ensure the bicycles are maintained and well used for the intended purposes. Some maintenance is needed, including regularly washing the bicycle as well as regularly checking the brakes and the tire pressure. Users also must ensure that nuts and bolts are and remain tight. Worn and damaged components must be replaced promptly.

Resources needed in use:

The students need to learn how to ride bicycles.

Problems and limits:

Cycling is affected by bad weather, especially during rainy days, rendering some parts of the road impassable. High â€œwet bulb temperatures â€˜â€™ (heat/humidity combinations) may also threaten a studentâ€™s health.

Where and how can you get it or make it?

Available at Plan International Kisumu.

Skills needed to produce, install. maintenance, use:

Production requires skilled personnel. Use of the bicycle requires a physical ability to ride it.

How to use it:

Not relevant.

How to maintain it:

Not relevant.

Climate effect (if any):

Bicycles are environmentally friendly since they do not emit any carbon to the atmosphere like other means of transport (diesel fleet emissions). Apart from walking, use of bicycles is the only way to cut carbon emissions in urban transportation.

Why is it successful?

BEEP providesdurable, reliable bicycles, significantly reducing the studentsâ€™ travel time to school. The bicycles are a cost effective way to improve educational outcomes for adolescent girls, and an appropriate technology to address long distances facing rural students.

If you can make it, a short description, typical problems, materials needed:

Production requires skilled personnel. Use of the bicycle requires a physical ability to ride it.

How to make it (if possible):

Not relevant

How is it delivered and by whom?

The bicycles were delivered by Plan International as a donation targeting 70% of the girls and 30 % of the boys within the selected schools. Creation of a diverse committee ensured deep community involvement. Incentives were provided for bicycle maintenance and care as well as for school attendance through study-to-own contracts signed by students and parents. Training provided to bicycle mechanics ensured that the bicycles remained in good working order, are some of the successful business models.

Successful financial model

Successful partnerships with the World Bicycle Relief (WBR).

What policies and strategies helped the success?

The local community was incorporated into the management of the programme (Bicycle for Education Empowerment Programme) through Bicycle Supervisory Committees, which act as the focal points for implementation of the programme. The committee helps to identify children who would benefit most from a bicycle, monitors the usage of the bicycles, and oversees the work of the field mechanics.

More info:

https://plan-international.org/kenya

Sources:

Plan International Kenya. Methodist Ministries Centre, Block C, 2nd floor Nairobi. P. O. Box 25196-00603 Kenya. T: +254 709 859000 / +254 20 2761000. Kenya.Co@plan-international.org

Case uploaded:

2021-02-23

Electric Bicycles - Bicycles Helped with a Motor





Why to choose this solution?

Electric bicycles offer a mobility which is in between bicycles and motorbikes. Changing from combustion engine motorcycles, you reduce the CO2 emission, air pollution, and noise. Compared to a normal bike, the electric motor helps you to drive faster and longer, and the rechargeable battery can be charged at night at home and at other electric outlets. For times or places without electricity to recharge, it is still possible to drive the bike by man power, as a normal bike.

Savings per day or production:

The cost of fuel is reduced by at least 70% compared to combustion engine motorbikes as electricity is cheaper than petrol and diesel.

Cost in money and in own time to construct:

The prices differ according to models for usages like private, cargo, re-used or new, from USD 400 to 1000. They can ride from 40 to 80 km by one charge with up to 25 km/h carrying 120 kg. A model driving 80 km in one charge costs USD 765 in Kenya.

Lifetime:

Bicycles itself last 10-20+ years. The battery lasts about 5 years, when it needs to be changed or you can continue use the bike without motor.

Maintenance needed:

It needs normal maintenance for bikes. You can adjust, how much the battery helps, from 25% to 100%. It is faster than normal bikes, so brakes need to be regularly checked, and helmet is need to be used. When there is no more power in the battery, you need to recharge it, if you want the motor to help.

Resources needed in use:

Electric bikes are normal bikes, which need the user to pedal for it to ride and has a motor helping to ride faster and up hill. Man power is always required and if you need the motor to help, the electricity is from the battery, which can be charged by normal electric plug.

Problems and limits:

The starter price is higher compared to a normal bike, but cheaper than a motorbike. The battery has a limitation of how many km it can power to ride depending on the models, and how much the motor is used. The battery is expensive to change after the 5 years.

Where and how can you get it or make it?

The electric bikes are available in shops and e-bike companies, which are importing, manufacturing or assembling them. There are companies, which convert bikes to electric bikes by attaching motor and battery. There are programs, and associations promoting bicycles and e-bicycles for community use by donating, renting or for reduced price.

Skills needed to produce, install. maintenance, use:

How to use it:

How to maintain it:

Climate effect (if any):

Using e-bikes reduces greenhouse gas emissions compared to fossil fuel vehicles.

Why is it successful?

It is succesful because it is a smart and cheap way of transportation. Cheap because it does not need fuels just energy from the battery, and in times of lack of energy, you can just use the pedals as a normal bike.

If you can make it, a short description, typical problems, materials needed:

How to make it (if possible):

How is it delivered and by whom?

Successful financial model

Loan, renting or leasing. Battery can be owned by a company with charging stations. Companies using it to employees delivering goods brings savings, and good image. Support and donations to community use as waste collection, water carriage for women, ambulance, and school children during school period, which is increasing school attendance.

What policies and strategies helped the success?

More info:

First African Bicycle Information Organization (FABIO), AfricroozEs bikes: https://fabio.or.ug/; eBee: https://ebee.africa/ and African Ebike: https://african-ebike.de/en/

Sources:

Case uploaded:

2022-12-01

ESFRITA Solar Dryer





Why to choose this solution?

Fresh fruits are highly perishable and bulky commodities because they contain high moisture. Solar drying of fruits and vegetables enhance the shelf life of fruits and vegetables.

Savings per day or production:

"Drying of crop produces to a form which has a longer shelf life and adding value to the original fruit helps the farmer not only to overcome the spoilage and losses, but also fetches good price due to the newly added value and to achieve the multiple benefits of crop drying."

Cost in money and in own time to construct:

"The solar dryer of 2.5m height and 1.5m width cost Tsh 1,700,000/= (UDS 737)"

Lifetime:

It has been used for more than 5 years without any repair.

Maintenance needed:

"After 5 years, repair of plastic nylon is needed."

Resources needed in use:

Just good solar radiation

Problems and limits:

"During rainy season, the product cannot be dried quickly"

Where and how can you get it or make it?

It is available at ESFRITA Group in Moshi Kilimanjaro- Tanzania and other parts of Tanzania

Skills needed to produce, install. maintenance, use:

" Repair and fabrication of the solar dryer requires short training

How to use it:

" https://youtu.be/PRq2R81cA0E

How to maintain it:

" https://youtu.be/PRq2R81cA0E

Climate effect (if any):

Solar energy which is the input required for drying crops in the dryer is a renewable energy thus no GHG emissions.

Why is it successful?

It is easy to use the technology and it has potential for income generation. Solar drying systems have low operation and maintenance costs. Also, with changing lifestyles and growing preference for ready to cook food

items, there is immense potential in this line of business.

If you can make it, a short description, typical problems, materials needed:

Need a qualifies technician for repairing.

How to make it (if possible):

N/A

How is it delivered and by whom?

Awareness raising on use of solar drier produces. Packing of produce in different quantities including 1kg for selling

Successful financial model

The initial cost for solar dryer was sorted out through Bank credit. Operational cost are covered from selling of dried solar products

What policies and strategies helped the success?

The leaders of the councillors in Tanzania help us by seminars, education and study tour in a different place in the Region.

More info:

esterina@yahoo.com, +255 755 869146

Sources:

ESFRITA Group

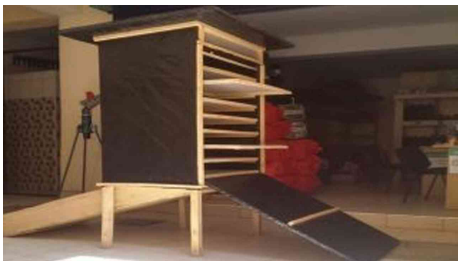
Case uploaded:

2022-05-02

Grekkon Limited Solar Dryer







Why to choose this solution?

These ventilated but enclosed dryers use solar energy to dry fruits, vegetables, significantly faster than would be possible drying produce unprotected and subject to the weather in the open air. A batch, which might take seven days to dry in the open air, would dry cleanly in just two days with a dryer. The sun UV rays do not reach the drying food, so its color, taste, scent, and nutritional value are unaffected. For all of these reasons, solar-dried foods are better for the health of the family. These solar drying systems are an effective means of food preservation, a good value to preserve highly perishable, nutritious foods.

Savings per day or production:

(1) Loss of quantity of food during drying is greatly reduced due to the owner ability to control the process. (2) Nutrition delivered per unit of dried food produced is greater. (3) Likelihood of illness from eating spoiled or contaminated food that was dried in these solar dryers is very low compared with that associated with open-air drying. (4) They reduce the drying period. For instance, a solar dryer will take two days to dry a batch if drying in the open takes seven days. (5) By stacking the layers of food and by excluding many undesirable factors that must be monitored in open-air drying, these dryers reduce the attention, time, and footprint required for the task, enabling owners to apply the saved time and space to other uses.

Cost in money and in own time to construct:

The price varies according to the design of the dryer. The smallest dryer is 3.4 cubic m in size and is priced at KSh 48,000 (USD 480), while a two-ton per session fruit dryer costs KSh 1,500,000 (USD 15,000). No owner time is required for construction or installation. Brief instruction is provided in the use and maintenance of the installed dryer.

Lifetime:

To be added.

Maintenance needed:

Cleaning the shelves and, occasionally, the enclosures as necessary to ensure free air circulation and to keep them contaminant-free.

Resources needed in use:

Placement that receives full sunlight, and that provides sufficient, empty open space around the enclosure to allow good air circulation within the dryer. Utilizes sunshine to heat up air that dries enclosed food products (including drying fruits, vegetables, meat, and cereals).

Problems and limits:

The dryers are expensive; hence, few farmers can afford them. Cloudy or rainy days may slow the process somewhat due to reduced input of sunlight.

Where and how can you get it or make it?

Solar dryers by Grekkon Limited are available from stores in Nairobi, Eldoret, Kisumu and Nyeri. They also

offer online shopping which is a convenient and fulfilling experience with easy and quick delivery.

Skills needed to produce, install. maintenance, use:

Construction and installation is done by skilled personnel from Grekkon Limited on site according to the food material and volume to be dried per drying session. Use and maintenance require only a short introduction.

How to use it:

To be added.

How to maintain it:

Not relevant.

Climate effect (if any):

They are environment-friendly, energy-conserving, and nearly four times as fast as open-air drying.

Why is it successful?

Once installed, these solar dryers need only sunlight and space slightly greater than their own footprints to produce more dried foods that deliver greater nutrition with less risk of contamination, all much more quickly and with less oversight than can be achieved with open-air drying.

If you can make it, a short description, typical problems, materials needed:

The dryers are constructed from food-grade materials from their structural systems to their covers. This is achieved by the use of UV-resistant cover and floor material, with food-grade zinc or aluminum galvanized structures. Dryers designs vary according to crop and desired quality output.

How to make it (if possible):

To be added.

How is it delivered and by whom?

Solar dryers by Grekkon Limited are available from stores in Nairobi, Eldoret, Kisumu, and Nyeri. They also offer online shopping which is a convenient and fulfilling experience with easy and quick delivery. The technical and agronomy teams of Grekkon Limited will design the dryer according to the crop and desired quality output. They will also offer support and can advise farmers on crop value addition.

Successful financial model

To be added.

What policies and strategies helped the success?

To be added .

More info:

https://grekkon.com/solar-dryers/

Sources:

Grekkon Limited Amrash Business Park, Utawala. +254 715 157 132 | +254 777 157 132 E: info@grekkon.com

Case uploaded:

2021-02-22

JEEP Solar Dryer





Why to choose this solution?

In comparison to the traditional ways of drying outside on open field, solar dryers prevent contamination and loss of produce from air pollution, rain, and dew, as well as from dust, molds, bacteria, insects, rodents, birds, and other pests, thereby ensuring quality. They allow small-scale farmers to overcome some post harvest losses by transforming their produce into storable and tradeable goods, which they can sell off-season at higher prices.

Savings per day or production:

The dryer can dry up to 500 kgs when built for home use, which is about 1000 shillings per kg, varying on the material in the dryer.

Cost in money and in own time to construct:

It costs about USh 200,000 (approximately USD 55) to construct for home and even less depending on the materials used. It can be constructed within 24 hours.

Lifetime:

It can stay to up to 5 years depending on the materials used during construction.

Maintenance needed:

Regular cleaning of glass material or polyethylene film; fixing polyethylene if torn.

Resources needed in use:

Drying trays.

Problems and limits:

It can be eaten by termites if not treated thoroughly during manufacturing. Cloudy or rainy days may slow the process somewhat due to reduced input of sunlight.

Where and how can you get it or make it?

The solar dryers are sold at JEEP offices in Kyanja and online shopping platforms.

Skills needed to produce, install. maintenance, use:

Installation requires trained technical personnel. There are no specific skills required to maintain or use the solar dryer. All you need is to be careful while handling it and always keep it clean.

How to use it:

Not relevant.

How to maintain it:

Not relevant.

Climate effect (if any):

This solution uses sunlight as a source of heat generation, reducing the use of biomass as a source of heat generation. The greenhouse-gas emissions of the food-drying process are cut by 90%. Solar food dryers also reduce the loss of trees to firewood as well as time spent harvesting it.

Why is it successful?

JEEP promotes use of renewable energy solutions for cooking. It has promoted this solution and has marketed it all over the country. JEEP conducts training programs. It also encourages youth to be creative and to start producing these boxes as a green enterprise, with a goal of and making the solution cheaper and available to people in all kinds of financial situations. Support from development partners has also contributed to the success of the solution, along with government policies encouraging solar use.

If you can make it, a short description, typical problems, materials needed:

Installation requires trained technical personnel. Materials needed include wood, nails, a board, and paint, as well as either a glass pane or transparent polyethylene sheet.

How to make it (if possible):

Not relevant.

How is it delivered and by whom?

Successful financial model

JEEP sells the solar dryer at a fair price plus it trains people on how to make them locally.

What policies and strategies helped the success?

The government offers tax exemptions on solar installations.

More info:

contact info@jeepfolkecenter.org

Sources:

JEEP folkecenter. JEEP, 7 Miles, Gayaza Rd, Kyanja, Kampala, P. O. Box 4264, Uganda. Tel: +256 414 578 316. Email: info@jeepfolkecenter.org https://jeepfolkecenter.org/

Case uploaded:

2021-03-12

Kawanda Solar Dryer





Why to choose this solution?

Preservation of agricultural produce is one of the central problems faced by small-scale farmers in Tanzania. Most frequently, horticultural crops in the markets spoil; some also remain unharvested, left in the fields due to inadequate market. Poor infrastructure also increases time to get crops to markets and often results in crops being damaged. At the end of the growing season, the supply of produce diminishes until the next harvest. Solar dryers allow small-scale farmers to transform their harvests into storable, tradable goods, which they can sell off-season at higher prices.

Savings per day or production:

Avoids loss and wastage of crops, particularly of vegetables and fruits. The Kawanda solar dryer can reduce wastage of a harvest surplus, allow storage for food shortages, and in some cases facilitate export to high-value markets.

Cost in money and in own time to construct:

Investment costs of solar dryers vary highly depending on the size of the solar dryer. Construction costs for a solar dryer of 4-12 trays range from 1.3 to 4 million Tanzanian Shillings, equivalent to US$ 565 to 1,740. The payback period for such dryers ranges from 2 to 4 years depending on the rate of utilization. Roughly two to five days are needed to construct a Kawanda solar dryer of 12 trays, using wooden materials.

Lifetime:

Usable for 8-10 years, unless â€˜Visqueneâ€™ polyethylene plastic is punctured with sharp edges or damaged by sun after some time.

Maintenance needed:

Replacement of â€œVisqueneâ€• polyethylene plastic whenever it is damaged.

Resources needed in use:

Raw materials such as fresh vegetables, fresh fruits, etc can be dried. Materials should be well cleaned and chopped before being dried. Otherwise, it just requires full sunlight and good air circulation.

Problems and limits:

Cloudy or rainy days may slow the process somewhat due to reduced input of sunlight, unless the system is integrated with a conventional energy-based system. Many people are still unfamiliar with solar-dried products, which makes market promotion important.

Where and how can you get it or make it?

In Tanzania, TaTEDO and other stakeholders have trained more than 50 local carpenters to construct and to maintain the solar dryer as well as to use the dryer and dried products.

Skills needed to produce, install. maintenance, use:

Short training needed on how to construct and maintain the solar dryer. Users of solar dryers need a short

introduction on how to use it.

How to use it:

https://www.youtube.com/watch?v=Un-1X4vu_YY

How to maintain it:

Keep shelves and enclosure clean, monitor for termites, repair torn film or broken glass.

Climate effect (if any):

The energy input needed in a solar dryer is less than what is needed for freezing or canning. Solar drying prevents food from decaying and spoiling, which would have resulted in methane release to the atmosphere.

Why is it successful?

Support services provided to entrepreneurs, including capacity-building through training and awareness, have contributed to the success. Presence of the Tanzanian Food Processors Association (TAFOPA) that has the objective to promote the development of womenâ€™s entrepreneurship in the food -processing sub- sector through the improvement of existing micro- enterprises managed by women, and to encourage new ventures with a potential to grow into small and medium enterprises.

If you can make it, a short description, typical problems, materials needed:

Materials used for construction include timber/ wood, â€œVisqueeneâ€• polyethylene plastic, mesh- covered drying trays to hold the produce, iron sheet for construction of chimney.

How to make it (if possible):

Short training is needed on how to make it.

How is it delivered and by whom?

Main actors of the solar dryer initiative include suppliers of agricultural produce, agro-processors, sales agents, development partners, and end users. Awareness-raising, product demonstrations, and market promotion of agro-processed foods through exhibitions, radio, newsletters, and other media have been used to popularize and to create demand for solar-dried products.

Successful financial model

In most cases, grants and loans have been used to cover initial investment costs. Operational and maintenance costs are covered from income generated through sales of the solar-dried products.

What policies and strategies helped the success?

Tanzania Horticultural Development Strategy 2012-2021, Agricultural Sector Development Strategy (ASDS), the Agricultural Sector Development Programme (ASDP).

More info:

A manual on how to use solar dryer is available at TaTEDO office, and can be accessed through request to TaTEDO.

Sources:

Address: MbeziJuu, Mpakani Road Goba House No GOB/KZD/883, P. O. Box 32794, Dar es Salaam, Tanzania. Tel: +255 738-201498, E-mail: energy@tatedo.or.tz, http://www.tatedo.or.tz

Case uploaded:

2020-08-11

Semi-industrial Solar Dryer





Why to choose this solution?

Solar dryers prevent destruction of agricultural produce from rain, wind, contamination, dust, insects, etc. and thereby ensure a better quality of produce. It allows small-scale farmers to improve storage conditions and reduces after-harvest losses. The higher quality increases the value of dried products, which may justify higher market prices.

Savings per day or production:

The dryer needs nothing more than solar radiation. The solar dryer can improve food security by allowing longer storage of food after drying compared to food that has not been dried.

Cost in money and in own time to construct:

The initial cost to acquire the semi-industrial solar dryer is high. The total cost of the materials amount to Tsh. 10 millions. A well-managed solar-drying business, however, can realize a payback period of 6-12 months.

Lifetime:

Depending on handling, the dryerâ€™s ultraviolet (UV) resistant plastic (Visqueen) could last for more than two years before changing it. The frame could last longer, especially if treated with anti-corrosion materials.

Maintenance needed:

After some time, it requires replacement of Visqueen papers, plus anti-corrosion material for treating frames.

Resources needed in use:

Solar radiation.

Problems and limits:

Not workable at night, efficiency decreases to a large extent on cloudy days, overheating may occur if regular attention is not paid.

Where and how can you get it or make it?

It is available in Tanzania. SESCOM is involved in construction and marketing. Skills needed to produce, install. maintenance, use.

Skills needed to produce, install. maintenance, use:

Training is needed on how to construct, maintain and use.

How to use it:

How to maintain it:

Climate effect (if any):

Drying food reduces its volume; thus, the amount of fuel which would have been required for transportation is reduced. CO2 emissions decrease as well: if solar drying replaces drying by electricity or fossil fuel, it reduces CO2 emissions.

Why is it successful?

It succeeds due to its potential to increase the ambient air temperature to a considerably high value for faster drying of agricultural crops.

If you can make it, a short description, typical problems, materials needed:

Some of the material needed includes galvanized sheet 2 mm, Visqueen sheet, green plastic wire mesh, square pipe, angle section, etc.

How to make it (if possible):

How is it delivered and by whom?

The main actors include the suppliers of construction materials, constructors such as SESCOM, a Small Industry Development Organization (SIDO), NGOs involved in awareness- raising and capacity-building such as TaTEDO, development partners with interest in supporting the initiatives, such as USAID, research institutions such as Sokoine University of Agriculture that are involved in technology improvement and research, and the Ministry of Agriculture and Cooperatives.

Successful financial model

Local capacity-building is one of the aspects that contributed to successful dissemination of semi-industrial solar dryers.

What policies and strategies helped the success?

Tanzania Horticultural Development Strategy 2012- 2021, Agricultural Sector Development Strategy (ASDS), the Agricultural Sector Development Programme (ASDP).

More info:

SESCOM, Tanzania https://sescom.co.tz/. TaTEDO, Tanzania: https://www.tatedo.co.tz/

Sources:

Case uploaded:

2021-06-10

Direct Solar Water Heater





Why to choose this solution?

Installing a solar Water Heater ensures hot water throughout the year, since the system works all year round.

Savings per day or production:

Sunlight is free, so once you have paid the initial installation cost, your hot water costs will be reduced leading to a reduced energy bill.

Cost in money and in own time to construct:

Some systems go for as low as KSh. 60,000 (USD 600). But something will always be faulty leading to eventually having to replace one part of the system or the other. A quality system costs an average of KSh.130,000 (USD 1300).

Lifetime:

The average life expectancy of certified solar water heating systems is 20 years.

Maintenance needed:

Periodic maintenance of solar water heaters is necessary every 3 to 5 years. Check for any kind of leakage in the pipes, tank, panels, etc., as leakage is very common in these areas. Also, you need to check for loose wire connections and wires. Ensure that the panels are kept dust-free.

Resources needed in use:

The solar thermal collectors convert the sunlight to heat energy. The heat transfer fluids (typically water) carry the heat from the solar collectors to water storage tanks. Heat exchangers transfer the heat from the transfer fluid to the home water supply. Storage tanks store hot water when it is not in use.

Problems and limits:

Solar thermal collector panels heat the water compared to solar PV panels, which produces electricity. The thermal collector panels require sufficient roof space to accommodate them. Solar water heaters require direct sunlight to function. The system does not function on cloudy, rainy, or foggy days.

Where and how can you get it or make it?

Solar Water Heating Suppliers in Nairobi Kenya, such as a solar hot water system supplier in View Park Towers. Tel; 0798 372318.

Skills needed to produce, install. maintenance, use:

Installation, maintenance and repair of these solar water heating technologies requires training in Technical and Vocational Education and Training Institutions for solar water heating. Solar heating modules usually can be found in shops.

How to use it:

See video https://www.youtube.com/watch?v=XSMPKAOpdrU

How to maintain it:

See video https://www.youtube.com/watch?v=eNnORkjM1h0

Climate effect (if any):

Solar water systems are sustainable heating systems because they use renewable energy, thus contributing to the reduction of carbon dioxide emissions.

Why is it successful?

They are super efficient, because of their round shape, which allows them to capture sun rays from all angles and makes them more effective in situations of cloudy skies. This characteristic allows them also to heat up water at higher temperatures compared to flat panels.

If you can make it, a short description, typical problems, materials needed:

It cannot be made by users, but must be made by the manufacturers.

How to make it (if possible):

How is it delivered and by whom?

Successful financial model

What policies and strategies helped the success?

The solar water heating systems industry in Kenya possesses the expertise and equipment to provide the merchandise without which the deployment might be less effective. The current Kenya National Energy Policy- Sessional Paper No. 4 strengthens the licensing procedures for practitioners. The success is determined by the number of new connections.

More info:

LES engages activities under the guidance of its CSR Policy through Lean Foundation. Its purview includes solar heaters. https://leansolutions.co.ke/solar-water-heating/. Solar heating training manual: https://www.ke.undp.org/content/kenya/en/home/library/environment_energy/solar-heating-training-manual.html , http://www.kerea.org/renewables/solar-water-heating/ .

Sources:

Lean Energy Solutions (LES), Nairobi, Kenya. Tel: +254 727 597 853, E-mail: info@leansolutions.co.ke.

Case uploaded:

2021-02-23