

EFFECTS OF

DEFORESTATION

AT MOUNT KILIMANJARO

AND HOW TO REDUCE DEFORESTATION



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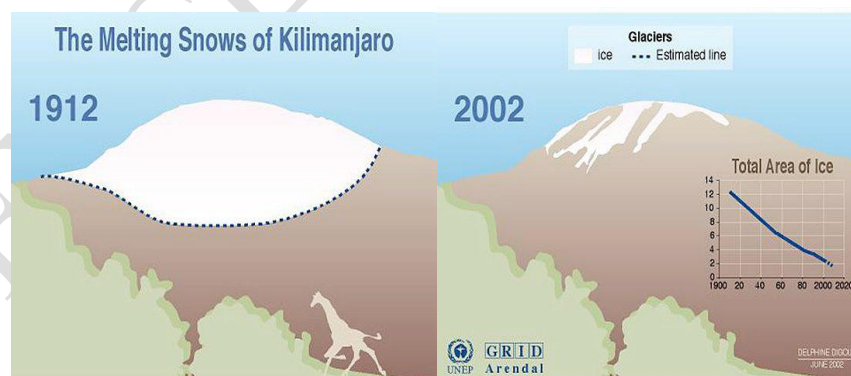
Ice caps are melting at the top of Mt. Kilimanjaro due to deforestation!...

Abstract

The highest mountain in Africa, Mt. Kilimanjaro, is facing a problem of climate change and melting of glaciers on the top of it due to deforestation and global warming. In this research, we mainly focus on reducing deforestation by preventing usage of charcoal. As an alternative solution, we advised solar cookers which gave us good results for cooking.

Introduction

Kilimanjaro, the highest mountain in Africa located in north-eastern Tanzania at 5,895 metres or 19,341 ft above sea level, is also the highest freestanding mountain as well as the 4th most prominent mountain in the world. However, it is suffering from a drastic climate change. The surveys explain that 85 % of the ice cover on the mountain has disappeared from 1912 to 2007. From 1912-1953 there was almost 1 % annual loss, while 1989-2007 saw almost 2.5 %

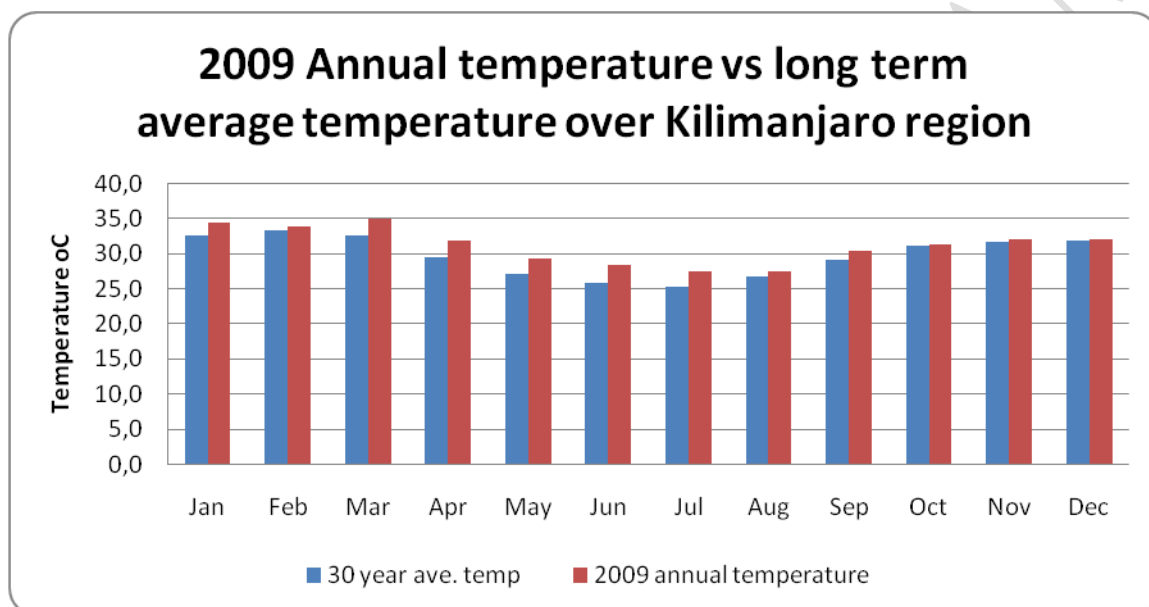


Source: adopted from Ehrhart & Twena (2006).

per year. Of the ice cover still present 2000, 26 % had disappeared by 2007. The current shrinking and thinning of Kilimanjaro's ice fields appears to be unique within its almost twelve millennium history. Unless trends (land usage, deforestation) change, it could become

ice-free as early as 2022. The main reason of climate change is seen as deforestation according a research published in 2007 (Pepin, N. C; Hardy, D; Duane, W; Losleben, M.)

Evidence shows that there have been rapid temperature changes in the last ten years with the changes being more drastic and dramatic in high altitude regions . (Muthumbi wa Kimani, 2011) The figure below shows how 2009 temperatures increased compared to 30 year average temperatures over Kilimanjaro region.



The closed dense forests cover is only 14.3 percent of the Kilimanjaro Region due to deforestation. Forests in Tanzania are under high pressure of human activities as agricultural activities, livestock grazing, *fires*, **charcoal burning** and other human activities. Out of total energy used in Tanzania, about 90 % is generated from wood. Traditional Energy and Environment Development Organisation (TaTEDO) recently revealed that about 65 million cubic meter of wood for fuel are consumed annually. The amount of wood fuel consumed will continue to increase with the increasing population. This is causing serious over-exploitation and degradation of natural forests in particular the production of **charcoal** used

for cooking. The high tariffs for electricity and gas prevent the potential users to switch to non-wood based fuels.

Goal of the project:

- Since out of total energy used in Tanzania, about 90 % is generated from wood (mainly charcoal for cooking) which causes deforestation therefore our target is to reduce the amount of deforestation by using solar cookers

A solar cooker use sunlight as its energy source. This means no fuel and cost nothing to run and safer. That's why it will slow deforestation caused by using woods as fuel for cooking.

Methods

Advantages of solar cookers:

- save money and time (sunshine is free, foods are cooked unattended while you do other things, pots are easy to clean, it is easy to make from a variety of materials)
- are safe, healthy and convenient (no fire to cause, no smoke to injure eyes and cause lung problems, cook at 80-120 Centigrade degree which is ideal for retaining nutrients and moisture)
- are life saving devices for regions lack of fuel (growing shortage of cooking fuels and the scourge of water borne diseases)
- save trees and soil (each solar cooker can save one ton of wood per year, prevent soil erosion by keeping trees)
- help air quality (poisonous gases result of burning will be prevented)

How to construct a solar cooker

Although there are many ways to construct a solar cooker, we prefer used satellite dish which does not function. With a simple modification, A solar cooker is constructed. See the modifications in the following picture.

We tilted the dish and covered it with aluminum foil then placed black fried pan in the centre of dish. We found out the following measurements for egg:

- a) egg was fried in 20 minutes
- b) the temperature in the pan reached 96 C while outside temperature was 36 C.

Better results and measurements can be taken if you choose a non-windy place, use a black and thin pot to make easy the absorption of heat, put a small amount of water, chop the foods into small pieces specially meat.

What can be cooked more

Any type of food can be cooked like vegetables, fruits, meat, egg, grains, legume etc.

Also, it is beneficial for the regions which have dirty water to make clean water. As a result, it will decrease the rate of water borne diseases. Temperature can reach up to 120 C. The most important point is to chop meat into smaller pieces to decrease amount of cooking time and less water than as usual.

What time of the day can we cook

When the length of your shadow on the ground is shorter than your height, It will be the best time for cooking. It means between 11 am and 3 pm. That time, sun is high enough in the sky to cook.

Result and Discussion

We got a delicious fried egg by using solar cookers in 20 minutes. Temperature reached 96 C while it was 36 C outside. We can cook all types of food only a little bit longer time. For rice, vegetables, fruits, fish and chicken, it takes maximum 2 hours. For potato, root vegetables, beans, breads and cake, it takes maximum 3 hours.

A satellite dish can be change into a solar cooker by simple modification. That will provide a safe, strong and longer lasting material. Nowadays, all satellites are being displaced by a digital system, means they will become rubbish for developed countries. Tanzania is getting a lot of donations from those countries, the charity organizations can provide donation of satellites to poor people from developed countries.

Conclusion

Solar cookers can be a good solution such countries like Tanzania which has sun light throughout the year and majority of its population uses charcoal due to poverty. It is tested and results are quite well. As a conclusion, we believe that this method will protect vegetation, and climate of the world biosphere heritage Mt. Kilimanjaro.

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GOLDEN CLIMATE-SAMPLE