

Module 4: Role of biomass in Africa and impacts of biofuels consumption on various socio-economic and other sectors

Workshop on the Strategic Framework for the African Bioenergy Data Management

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- Importance of biofuels in Africa
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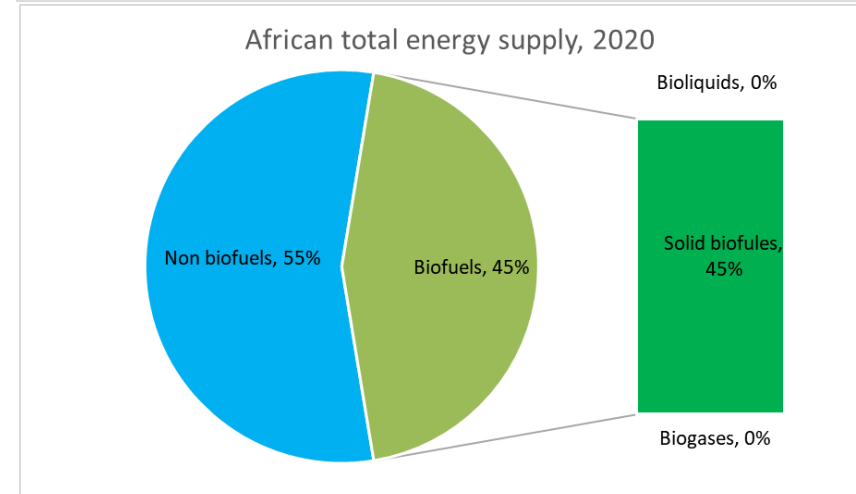
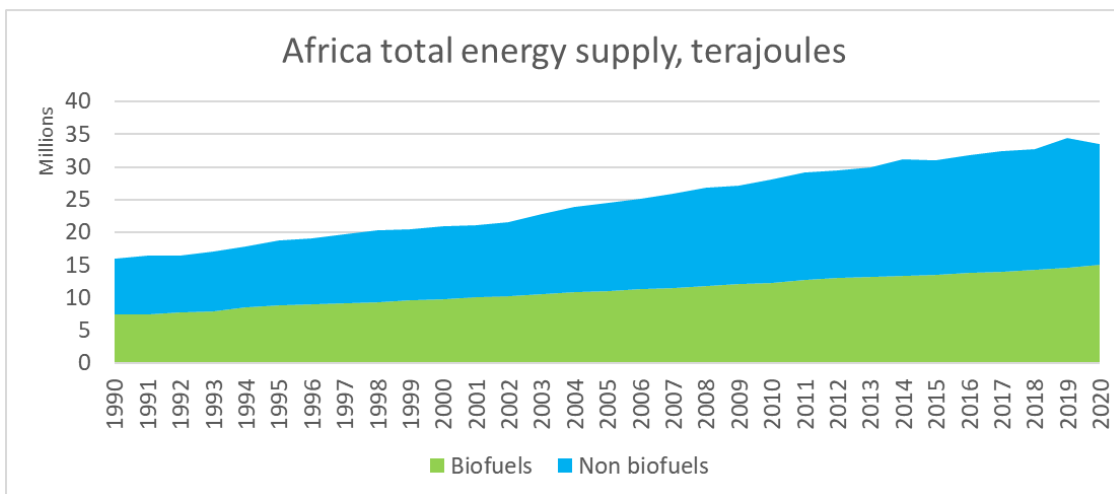
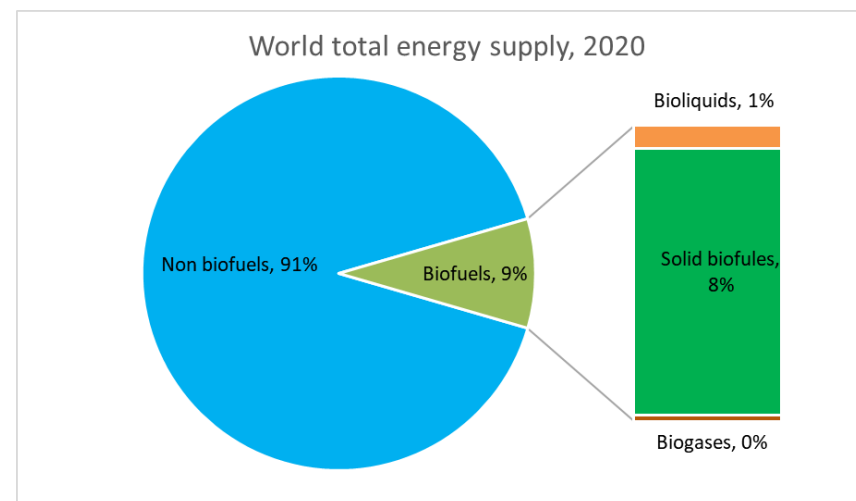
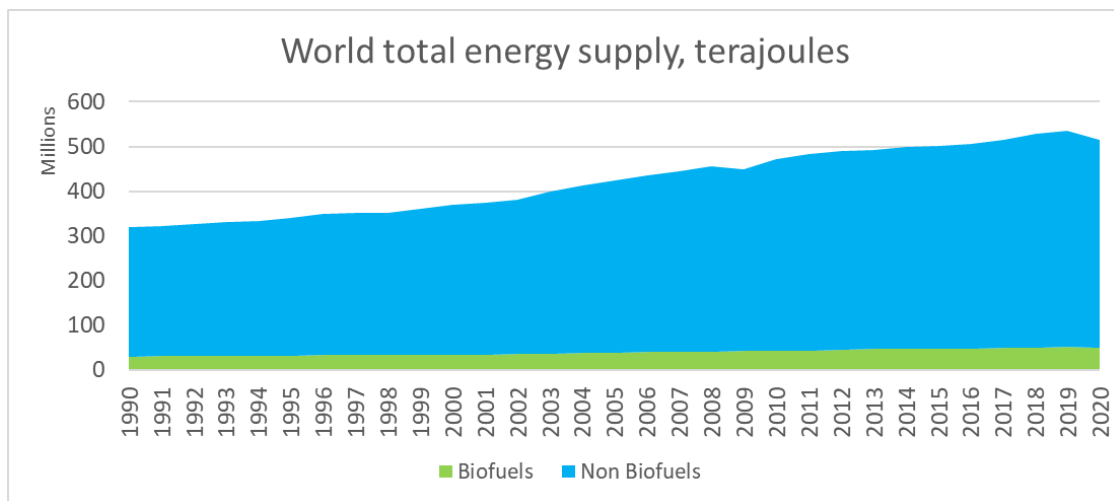
Introduction

- It is estimated that Africa is consuming around 40% of all biofuels, most of which are solid biofuels used in the traditional way in households.
- Biofuels represented 45% of African total energy supply and 52% of African total final energy consumption in 2020.
- According to FAO, about half the wood extracted worldwide from forests is used to produce energy, mostly for cooking and heating. Of all the wood used as fuel worldwide, about 17% is converted to charcoal.
- FAO estimates that around quarter of solid biofuels in Africa in 2020 was transformed to charcoal. Most of the production of charcoal in Africa is carried out using traditional stoves and inefficient technologies.
- As Africa is witnessing the phenomenon of urbanization, we observed in many countries switch from using fuelwood to charcoal. Global charcoal production is expected to continue increasing in coming decades.
- The biofuels consumption has significant impact on many social and economical sectors.

Importance of biofuels in energy mix

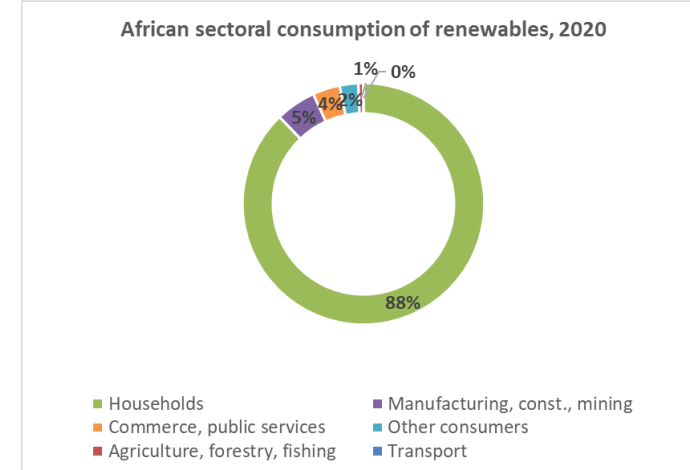
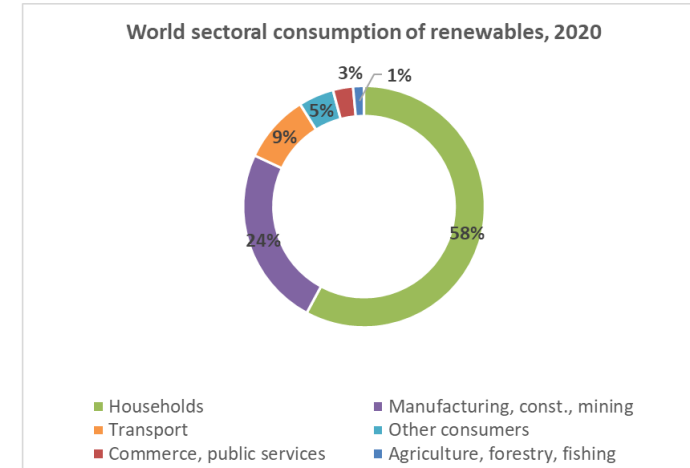
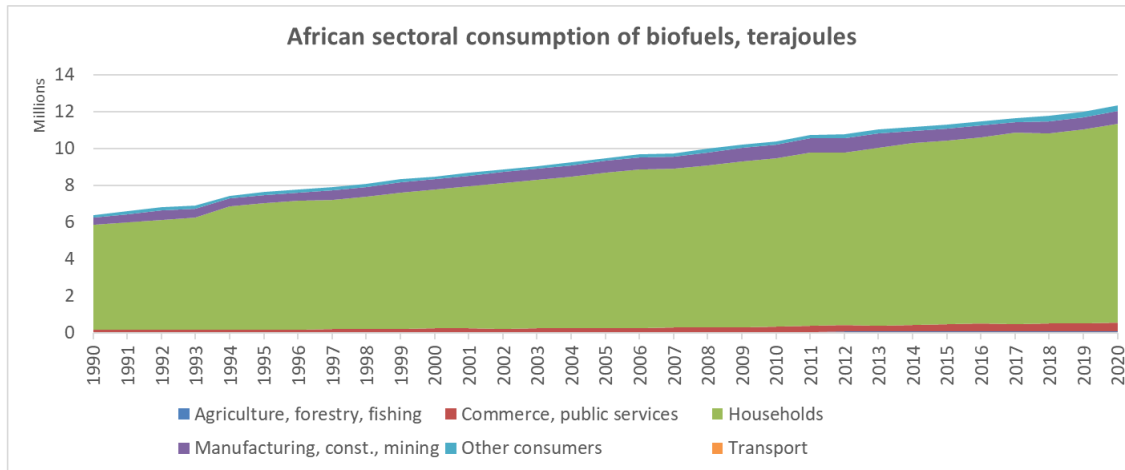
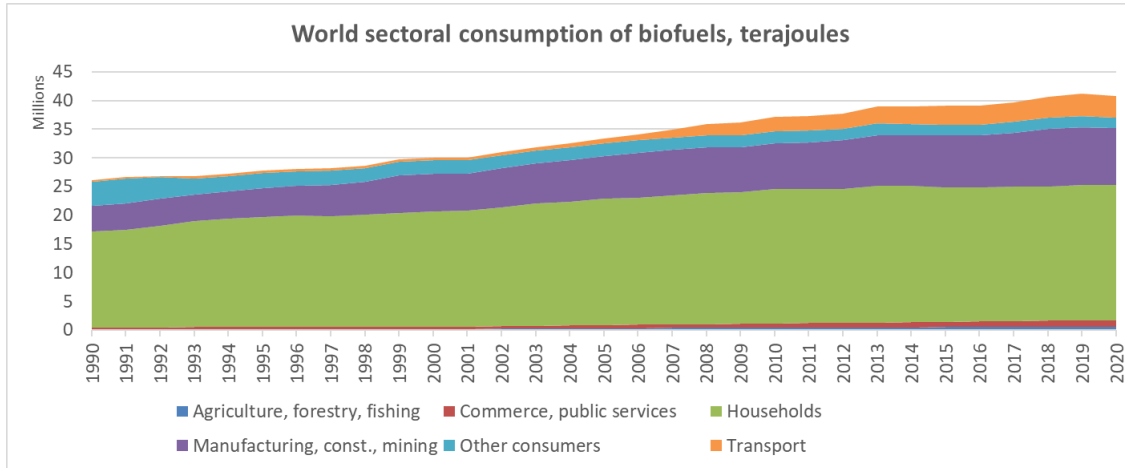


World and African total energy supply



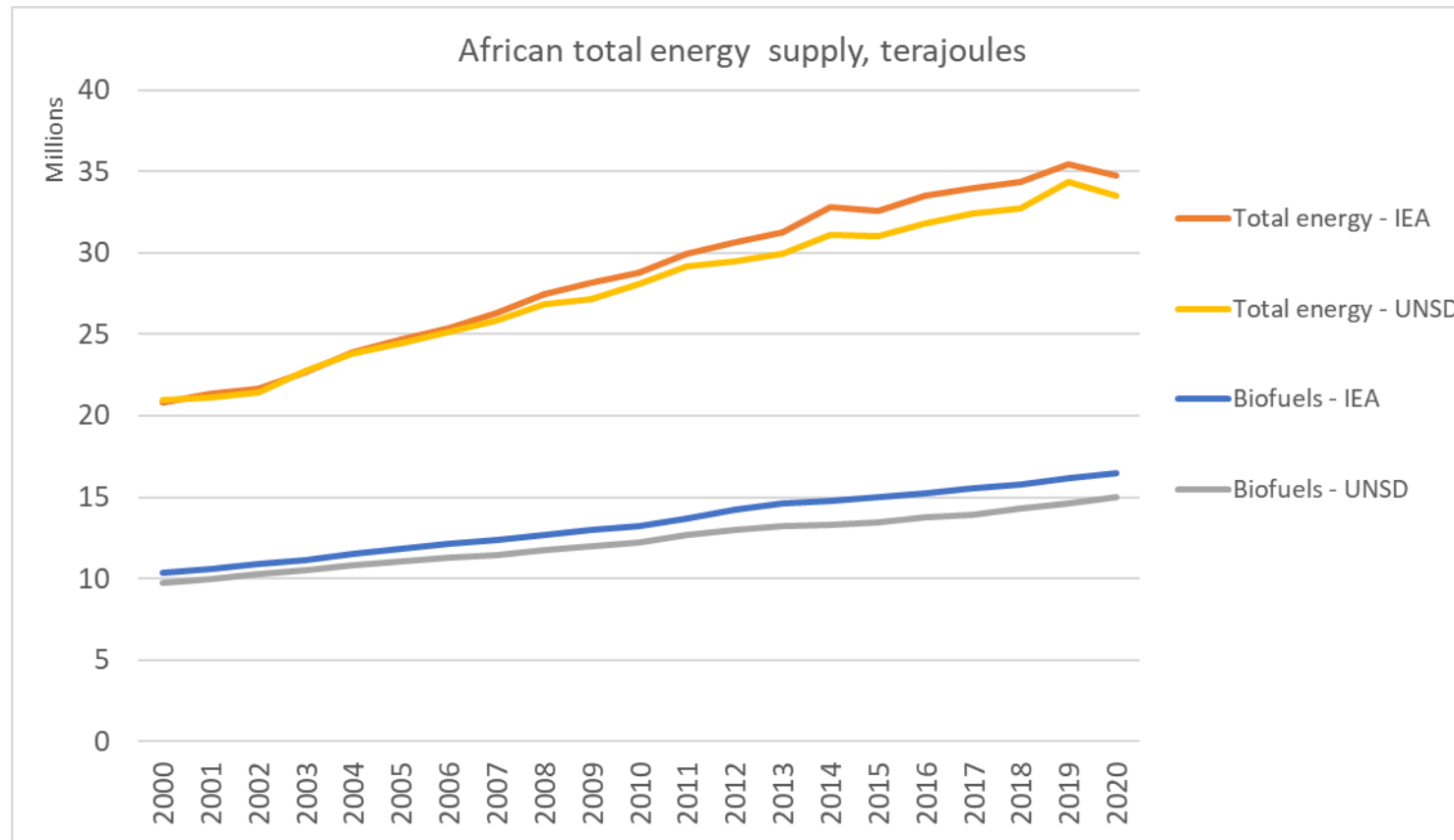
Biofuels accounted* for 9% of total energy supply globally, and for 45% of African total energy supply in 2020.

World and African sectoral consumption



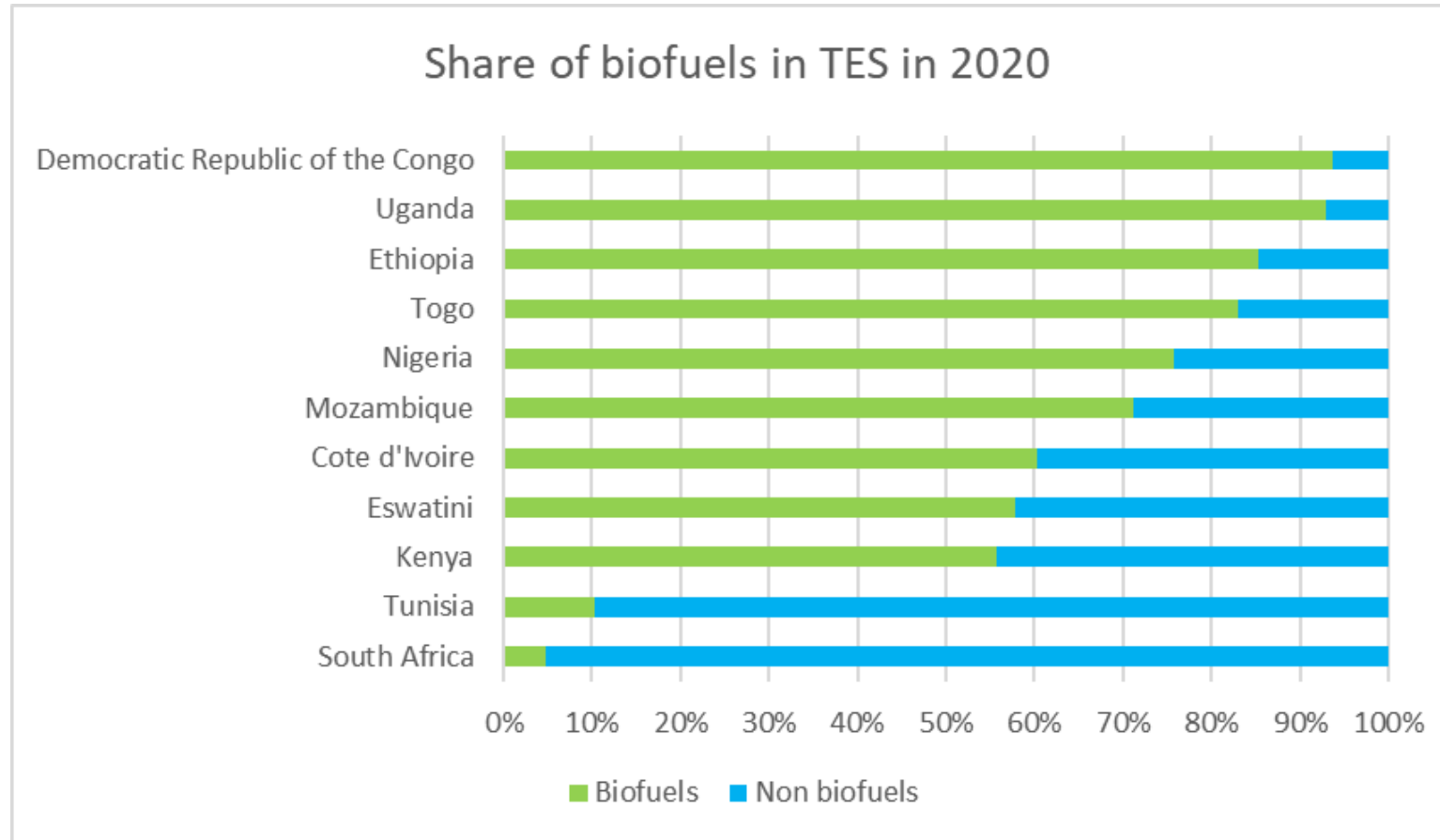
Almost 90% of biofuels in Africa are estimated to be consumed in households.

Differences in estimates of biofuels data

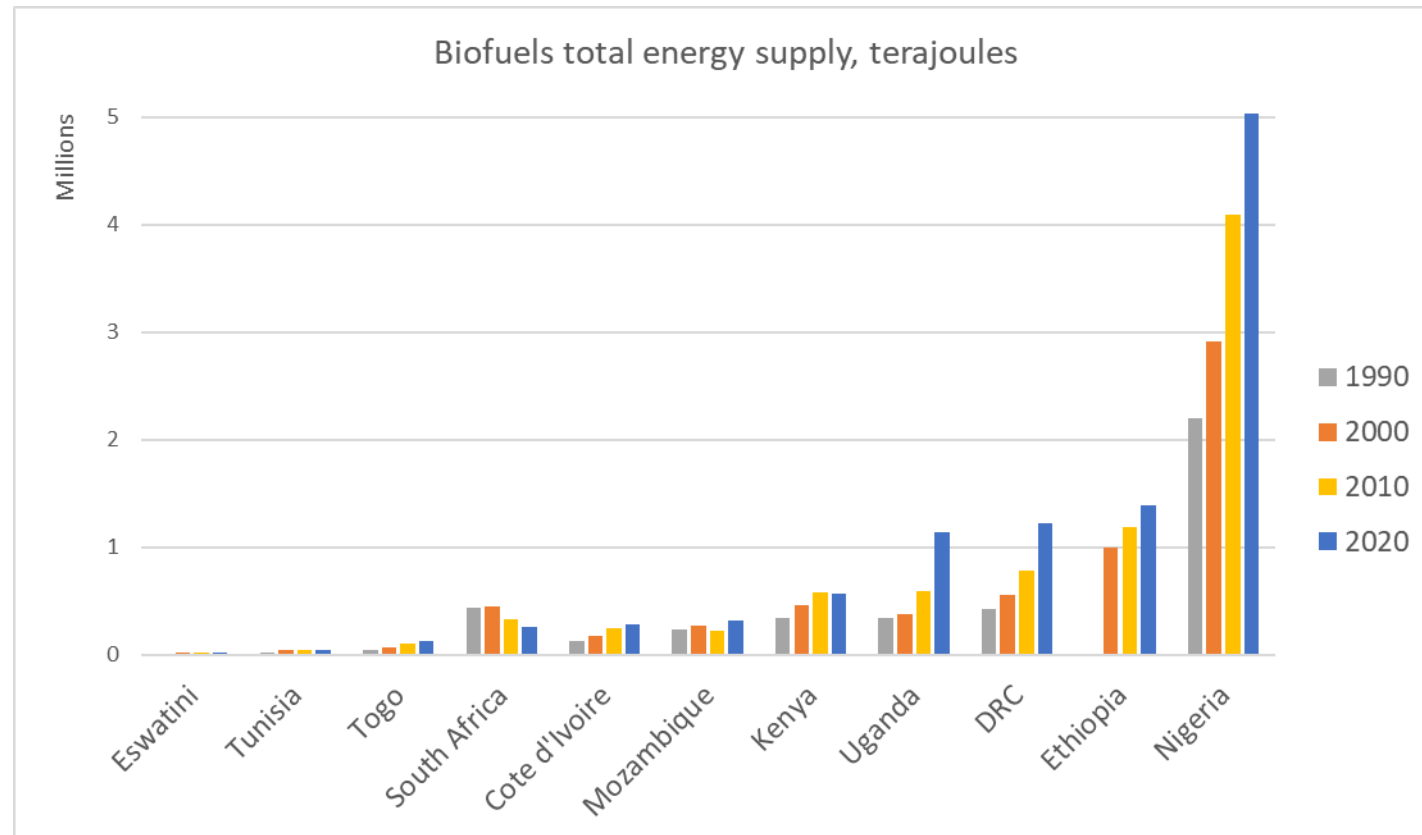


The difference in estimates between IEA and UNSD of biofuels is equal to around 5% of African TES.

Importance of biofuels in energy mix for the present countries

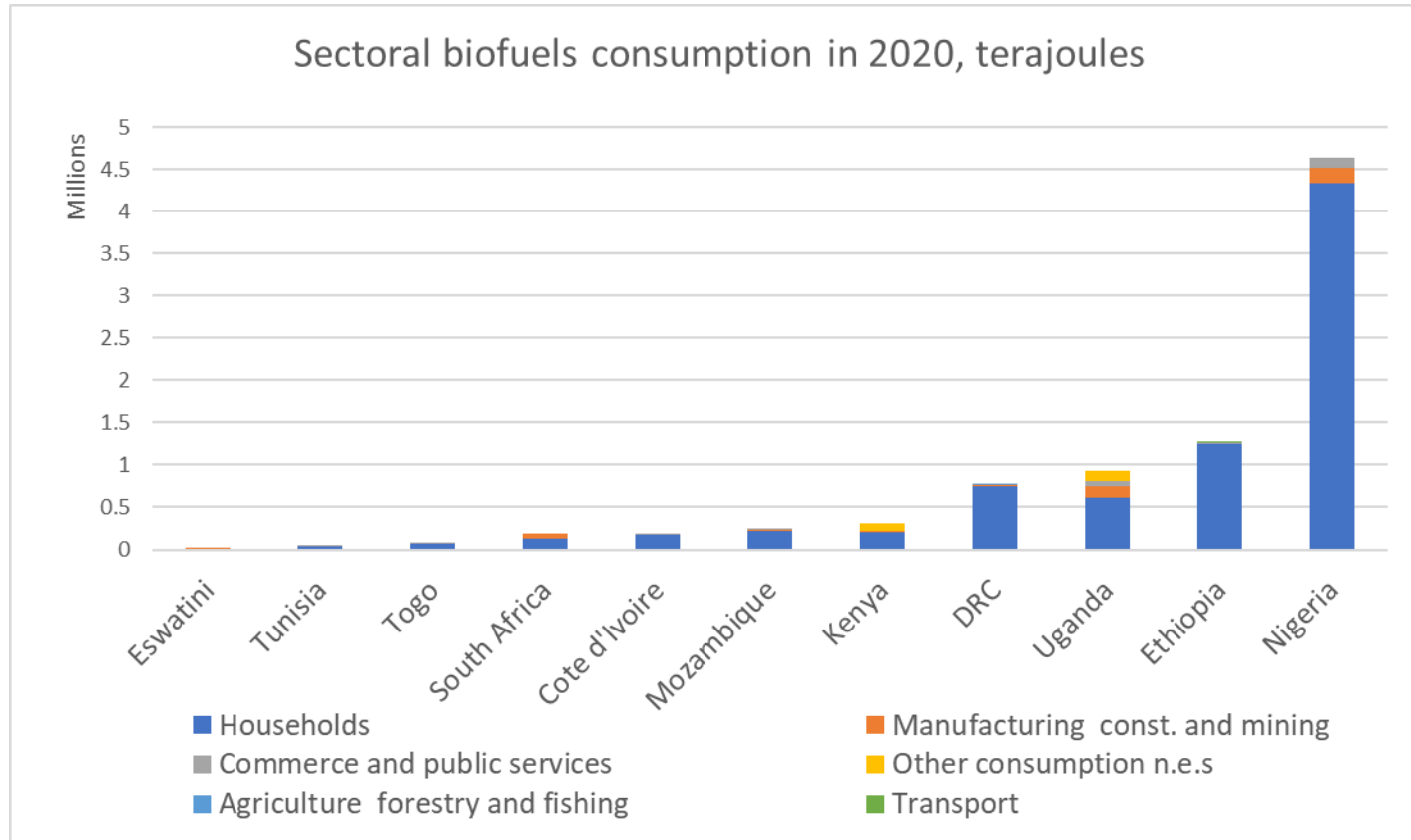


Biofuels total energy supply in selected years



For some countries the increase is estimated to be very steep.

Sectoral consumption of biofuels in 2020



Similarly as for Africa as a whole, household sector dominates in consumption of biofuels.

Importance of biofuels in Africa



Importance of traditional biofuels for Africa

Despite severe health, environmental and climate extremities biofuels are important for many aspects of human lives:

- Biofuels use, cooking practices and preferences are strongly linked to cultural and economic context.
- Biofuels contribute to the energy and food security of millions of people, allowing people to boil drinking water for sanitary purposes, and for processing and preserving food.
- Fuelwood and charcoal production provides employment opportunities. According to World Bank estimates, the sub-Saharan charcoal sector alone employs around 7 million people.
- Cash income e.g. from employment in the charcoal production and trade helps diversify household incomes and pay for basic needs such as food, medical care and school fees.
- Biofuels stoves in some seasons play a multipurpose role, providing space heating.

Main drivers of biofuels consumption

- In developing countries where households rely on solid biofuels, the growth of the population contributes to increase of biofuels consumption.
- In the sub-Saharan Africa, urbanization leads to increase in charcoal use.
- Users' preferences and needs in specific cultural, geographical and economic contexts.

Awareness of household air pollution effects are crucial to change fuels choices in developing countries.

Impact of biofuels consumption on health



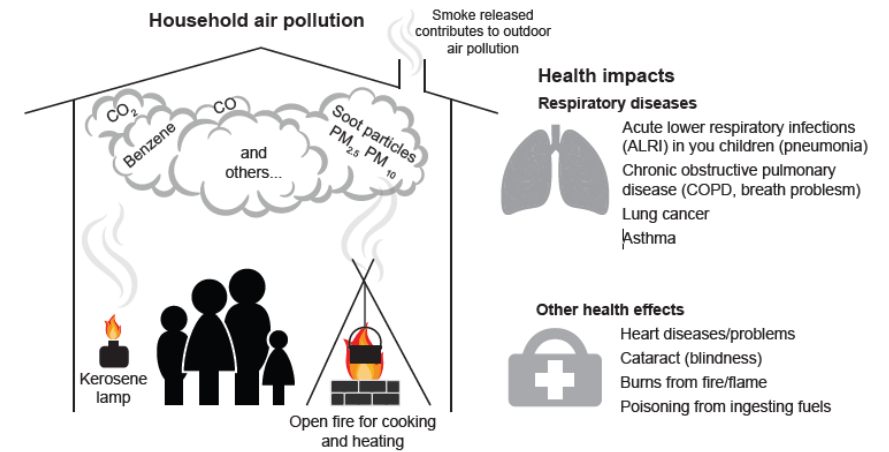
Impact of biofuels consumption on health

- Solid biofuels burnt in inefficient stoves and poorly ventilated kitchens have important health consequences. because release fine particles, carbon monoxide, methane and many other toxic substances to human beings.
- This household air pollution causes respiratory diseases and is contributing factor to premature deaths and the increase of disability-adjusted life years. Incomplete combustion of solid biofuels for cooking are strongly linked to acute lower respiratory infections (ALRI), chronic obstructive pulmonary disease (COPD), lung cancer, ischemic heart disease, cerebrovascular diseases, cataracts, and low birth weights.



Household air pollution

- World Health Organization estimates that 3.2 million deaths from diseases were caused by household air pollution from the use of inefficient stoves paired with biomass, coal and kerosene for cooking in 2019. (Tracking SDG7: The Energy Progress Report 2020). Namely, household air pollution was linked to :
 - 25% of all deaths from stroke,
 - 15% of deaths from ischaemic heart disease,
 - 17% of deaths from lung cancer, and more than
 - 33% of all deaths from chronic obstructive pulmonary disease in low- and middle-income countries.
- Household air pollution exposure is responsible for close to one quarter of the disease burden from cataract, the leading cause of blindness in low- and middle-income countries.
- Household air pollution accounted for the loss of an estimated 86 million healthy life years, with the largest burden falling on women living in low- and middle-income countries. (Tracking SDG7: The Energy Progress Report 2020).



Source: UNEP, African Union (2019), *Review of Woodfuel Biomass Production and Utilization in Africa. A Desk Study*

Fuel-stove stacking - how people use energy at home

- Serious health risks can persist even if a household uses a clean fuel like gas for its primary cooking needs. If an inefficient stove or device is used alongside a newly adopted clean one, pollution levels inside the home may remain dangerously high, and the intended health benefits may not be realized.
- Households may use in parallel multiple types of fuels and technologies; this phenomena is known as “Fuel-stove stacking”. For example, despite having access to LPG, household continues to use on inefficient stove:
 - As a backup in case of LPG supply disruption,
 - Because pots are not compatible with new “improved” one,
 - To prepare feed for their animals only,
 - For heating.
- If a household adopts one clean fuel–device combination, it does not mean automatically that the household air pollution will reduce.

Energy service	Developing country households		
	Lower-income	Middle-income	Higher-income
Cooking			
Lighting			
Heating			

*As countries transition to higher income levels, households transition to cleaner cooking, lighting and heating energy sources.
Source: Adapted from Sovacool (2012).

Impact of biofuels consumption on environment



Impact of biofuels consumption on environment

- Solid biomass when unsustainably harvested can deplete forest stocks or lead to deforestation and ultimately climate change.
- According to FAO's Global Forest Resources Assessment 2020, Africa had the largest annual rate of net forest loss in 2010–2020 from all the continents, at 3.9 million ha. Moreover, the rate of net forest loss has increased in Africa in each of the three decades since 1990.
- Deforestation is also a strong consequence of unsustainable charcoal and biofuel production, among others being agricultural expansion, mineral extraction, infrastructure development as well as commercial logging. At this moment, there is no reliable estimate about how much of the forest loss was due to fuelwood productions.



Impact of biofuels consumption on environment

- Increase in GHG emission is also a strong consequence of the traditional use of solid biofuels.
- According to UNEP:
 - “An estimated 1–2.4 Gt of carbon dioxide equivalent in greenhouse gases are emitted annually in producing and using fuelwood and charcoal, which is 2-7 per cent of global anthropogenic emissions. These emissions are due largely to unsustainable forest management, and inefficient charcoal manufacture and woodfuel combustion. Solid-fuel cooking in sub-Saharan Africa accounts for 6 per cent of global black carbon emissions and 1.2 per cent of carbon dioxide emissions.”



Impact of biofuels consumption on economy



Impact of biofuels consumption on economies

- The traditional use of biofuels, brings some economic losses of productive time, both because of time spent in biomass collection and extra time of cooking with traditional devices and fuels.
- According to World Bank more than 40 million worker years are wasted each year on fuelwood gathering and slow biomass cooking.
- Cooking with traditional fuels and stoves represents a US\$32 billion opportunity cost (3 per cent of sub-Saharan Africa's GDP) according to UNEP.

Economic losses and opportunity costs in sub-Saharan Africa from dependence on solid fuel in 2010 (US\$ billions)

Cost category	Low	Mid-range	High
Economic effects	\$4.2	\$20.6	\$36.9
Spending on solid fuels	\$0.4	\$3.8	\$7.3
Time wastage (fuel collection)	\$0.6	\$6.5	\$12.4
Time wastage (cooking time)	\$3.3	\$10.2	\$17.2
Total	\$5.4	\$31.8	\$58.2

Source: Kammila, et al (2014), *Clean and improved cooking in Sub-Saharan Africa : a landscape report*

Impact of biofuels consumption on women and children



Impact of biofuels consumption on women

- In Africa, usually women and children are in charge of collecting the fuelwood for cooking. They sometimes have to travel long distances to collect the wood what can compromise their health and safety.
- Women are usually responsible for cooking for the family and exposed more to smoke in poorly ventilated kitchens. This may jeopardize women health and impede their role as the main caregivers in families.
- The time spend on collecting wood and cooking could be used on more productive activities.



Impact of biofuels consumption on children

In households using traditionally biomass:

- girls spend significantly more time collecting fuelwood – estimates show on average 18 hours a week compared to 5 hours a week – jeopardizing their chances to succeed in education.
- girls have increased risk of pneumonia associated with smoke because they stay in kitchen environs with their mothers longer than boys.
- children strapped on their mothers' backs during cooking – what is a common way of carrying them in Africa - were six times more likely to develop Acute Respiratory Infections (ARI) than unexposed children.

Additionally, in schools and dormitories without access to clean energy staff need to rely on wood, charcoal and kerosene for lighting, heating, and cooking purposes what expose students to indoor air pollution.

Conclusion



Conclusion

- Unsustainable and traditional use of biofuels have dramatic consequences for the environment, economic development, and health, particularly of women and children.
- Currently there is no reliable data to monitor biofuels consumption in Africa, or to monitor and evaluate programmes or policy performance related to biofuels consumption.
- Increased effort to improve biofuels data availability is needed in many countries, particularly for households' fuelwood use.



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Thank you.

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