

AN OVERVIEW OF CONSUMPTION OF BIOGAS IN THE CONTEXT OF SOMALIA

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Abstract

Despite technological advances, many people, particularly in developing countries' rural areas, continue to meet their cooking energy needs by burning biomass resources such as crop residues, firewood, and animal dung in crude stoves. Such practices are known to cause significant environmental, social, economic, and public health problems. Thus, converting existing biomass resources to cleaner and more efficient energy carriers such as biogas has the unique potential to provide clean and reliable energy while also protecting the environment. The purpose this paper is to provide a brief review of consumption of biogas in the context of Somalia. The paper briefly reviews the consumption of biogas in Somalia. The first part of the paper covers introduction, which seeks to unpack the concept of biogas, and provides an overview of biogas consumption from global perspective. The main body of the paper highlights the theme of biogas consumption in Somalia. Literature shows that only about 1% of Somali community consumes biogas. However, there are critical gaps in the available body of knowledge on biogas consumption in Somalia. Thus, this paper recommends empirical research to be conducted to examine the consumption of biogas in the context of Somalia. The findings of such research could be used to inform policy formulation in relation to biogas production in Somalia.

1. Introduction

Biogas is a gas produced by a mixed population of microorganisms during anaerobic digestion of organic matter. It is an alternative energy source, which has been commenced to be utilized both in rural and industrial areas (Balat, M. & Balat, H., 2009). As a result, biogas is a dynamic energy source that can be used to replace fossil fuels in power generation and heat generation, as well as a gaseous fuel (Weiland, 2010).

Despite technological advances, many people, particularly in developing countries' rural areas, continue to meet their cooking energy needs by burning biomass resources such as crop residues, firewood, and animal dung in crude stoves. Such practices are known to cause significant environmental, social, economic, and public health problems. In this context, converting existing

biomass resources to cleaner and more efficient energy carriers such as biogas has the unique potential to provide clean and reliable energy while also protecting the environment (Surendra, Takara, Hashimoto & Khanal, 2014).

Energy demand is expected to continue to rise around the world. Total energy consumption is expected to increase nearly 50% by 2050 as a result of emerging economies. Not only is demand for fossil fuels expected to rise, but so will demand for renewable energy sources such as wind and solar, among others. Renewable energy is expected to account for 65% of the \$7.7 trillion in power investment by 2030, according to Bloomberg New Energy Finance. This paper provides an overview of the consumption of biogas in the context of Somalia.

2. Consumption of Biogas in Somalia

Somalia is a country in eastern Africa located on the Gulf of Aden. The land has a total area of 637,660 km² (246,202 mi²) and a total coastline of 3,025 km (1,879.6 mi). This land area accounts for roughly 92 percent of Texas' total land area. As a result, Somalia is the 19th largest country in Africa and the 43rd largest country in the world by area. Only slightly less than half of all residents (46%) live in cities (WorldData, 2019).

Somalia is an arid/semi-arid region where livestock is the main source of income for the majority of the population. Underdevelopment as a result of years of neglect to keep up with the region's development needs has left the majority of the population without access to dependable energy sources, leading to an unsustainable use of natural resources (UNGM, 2012).

In Somalia, biomass is the most commonly used source of energy, according to the African Development Bank, with approximately 97% of urban households relying on charcoal and rural households relying on firewood as their primary source of energy. This puts enormous strain on the forest resource, contributing to desertification and the destruction of grazing and arable land. As a result, forest cover was approximately 60% of the land area in 1985, but by 2001, it had decreased to approximately 10% of the land area or approximately 6.5 million ha according to the Renewable Energy and Energy Efficiency Partnership. Other sources of energy include oil and

natural gas, wind, geothermal and solar. Table 1 shows production capacities per energy source in relation to other energy sources or countries.

Table 1
Energy production capacities per energy source in Somalia

| Energy source | total in Somalia | percentage in Somalia | percentage USA |
|---------------------------|-----------------------------|----------------------------------|---------------------------|
| Fossil fuels | 692.48 m kWh | 93,0 % | 70,0 % |
| Nuclear power | 0.00 kWh | 0,0 % | 9,0 % |
| Water power | 0.00 kWh | 0,0 % | 7,0 % |
| Renewable energy | 52.12 m kWh | 7,0 % | 14,0 % |
| Total production capacity | 744.60 m kWh | 100,0 % | 100,0 % |
| Actual total production | 339.00 m kWh | 45.5 % | 43.0 % |

Source: World Data (2019)

As shown in Table 1, comparative analysis between Somalia and USA on renewable energy shows a huge difference. Renewable total energy production in Somalia stands at 7% as compared to 14% in USA.

A number of international organization assessments have identified biogas as one of Somalia's viable options. However, data on biogas consumption in the country remains rather scanty. According to World Data (2019), about 1% of Somali community consumes biogas. The demand for the renewable energy including biogas, as evident from literature, is expected to grow exponentially by the year 2050 (WorldData, 2019). With a large number of livestock in the region and a high production of biodegradable waste, biogas has the potential to become a major source of energy for both rural and urban Somalis, providing gas for cooking and electricity generation (UNGM, 2012).

3. Conclusion

Given the country's current geographical gap in biogas production and the local community's pastoralism way of life, as well as the fact that 40% of the population in rural Somalia lives in extreme poverty (IFAD, 2015), there is a need to invest in biogas production in the country. With

a ban on the production and export of charcoal in Somalia (UNEP, 2019), the most fundamental option remains to seek sustainable energy solutions. However, to realize this, there is a need to conduct more national and community level biogas advocacy programs and pro-biogas-use government policies in Somalia and conduct further empirical research to cover the existing knowledge gap.

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