

# POTENTIALS FOR BIOMASS UTILIZATION IN GHANA



PRESENTED BY

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# GHANA AND AFRICA



# PRESENTATION OUTLINE

- Biomass contribution to world energy supplies
- Importance of Biomass to the economy of Ghana and Brong Ahafo
- Sources of Wood fuels in Ghana
- Access for development and growth
- Status of major Producing areas
- Prospects of energy generation from Biomass
- Prospects in the Brong Ahafo Region
- Marketing of biomass
- Sustainability of Biomass resources



# INTRODUCTION

- Biomass is a renewable and readily available resource that could be used for the production of heat, power, transport fuels, and bio-products.
- It is a carbon-neutral carrier and can make great contribution to reducing emissions of greenhouse gas when produced and used sustainably.
- Biomass is considered as important renewable energy resources and its trade plays a major role in the economies of many developing countries.
- It could be converted into other forms of useful raw materials at community-level ventures.(Eg. Plant based biomass waste into Liquid smoke)



# OVERVIEW OF CONTRIBUTION OF BIOMASS TO WORLD ENERGY SECTOR

- Energy from biomass contributes approximately 10% of global energy supply
- Two thirds of this bioenergy is generated in developing countries where it contribute 20 -30% of energy supply
- In sub-Saharan Africa, biomass provides the primary source of energy, contributing over 70% of the all energy needs
- About 81% of rural households in Sub-Saharan Africa also rely on woody biomass for cooking and heating.



# IMPORTANCE OF BIOMASS TO GHANA

- In Ghana, energy from Biomass provides about 64% of urban energy supply and about 80% of energy for cooking and heating in rural areas.
- Biomass particularly woody biomass provides direct employment for about one 144,000 people.
- Over three million people in small and informal enterprises in both cities and rural depend on woody biomass for energy to run their businesses.
- Demand for energy from woody biomass is growing at rate of 1.2% p.a.

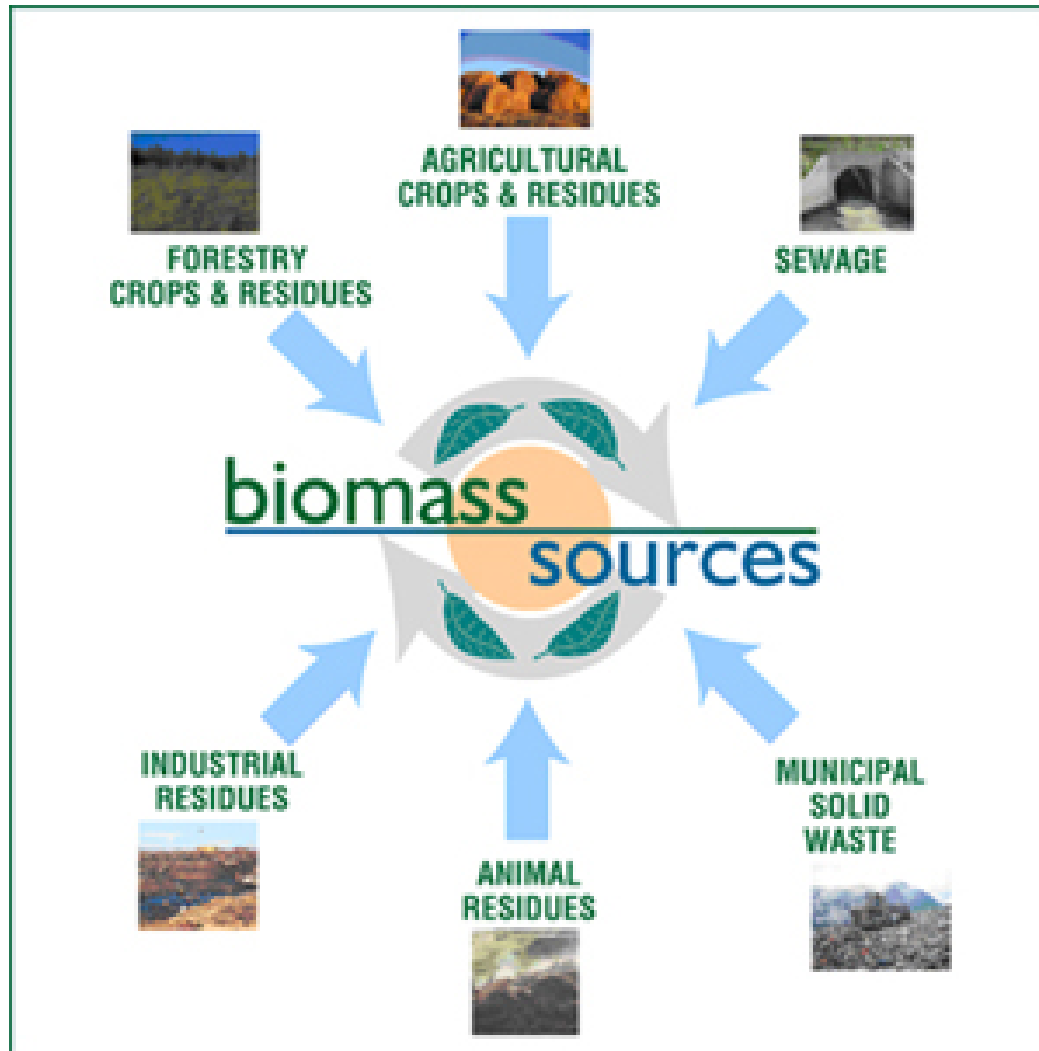


# THE IMPORTANCE OF BIOMASS TO GHANA

- Biomass (charcoal and firewood) production is a major livelihood activity in the Bono, Bono East Ahafo and the savannah zones
- Woody biomass production is a thriving business in these regions and provide the best alternative to the dwindling fortunes of agriculture
- Charcoal in particular is an important internationally traded solid biomass commodity with high economic value.
- There is also market potential of sawdust and charcoal briquettes



# SOURCES OF BIOMASS





# ACCESS FOR DEVELOPMENT AND GROWTH

- The economy of Ghana is growing into middle income status and access to energy is critical to ensure development and growth.
- Energy from biomass provides sustenance for all rural economies and shortfalls in supply is beginning to cripple rural economic growth and devastate livelihoods.
- Access to sustainable renewable energy sources have become imperative due to the urgent need to rapidly reduce carbon emissions and respond to the highly negative impact of climate change.



# STATUS OF MAJOR PRODUCING AREAS

- The transitional and savannah zones of Ghana are the major sources of woodfuels preferred by most Ghanaian homes.
- There are signs that some preferred species for woodfuel production are disappearing.
- The result is that producers have to travel longer distances in search of the desired species.



# STATUS OF MAJOR PRODUCING AREAS

- Charcoal production requires a lot of raw wood; between four to six units of wood are needed to produce one unit of charcoal, depending upon the quality, type of wood and the type of kiln used.
- Almost all the kilns in the country are the traditional earthmound, which is least efficient in terms of charcoal yield.
- Identification and maintenance of sustainable and environmentally friendly energy resources and production processes are keys to sustainable resource base and livelihoods.



# BAGS OF CHARCOAL BY THE HIGH WAY





# PROSPECTS OF ENERGY GENERATION FROM BIOMASS

- Biomass based energy, apart from the direct use of firewood and charcoal, has been exploited to a very limited extent in Ghana.
- Biomass used for the generation of electricity, biogas or liquid fuels remains largely untapped.
- Some biomass-fired cogeneration projects have been implemented in the oil-palm industry, but are under-utilized.



# PROSPECTS OF ENERGY GENERATION FROM BIOMASS

- Two key factors have hindered their exploitation particularly, wood processing industry although there seem to be some potential for it.
- Firstly, how potential co-generators could have access to lower cost grid power;
- Secondly, there are virtually no financial or fiscal incentives, neither is there a regulatory framework that would encourage them to generate and sell electricity to the grid.




# PROSPECTS OF ENERGY GENERATION FROM BIOMASS

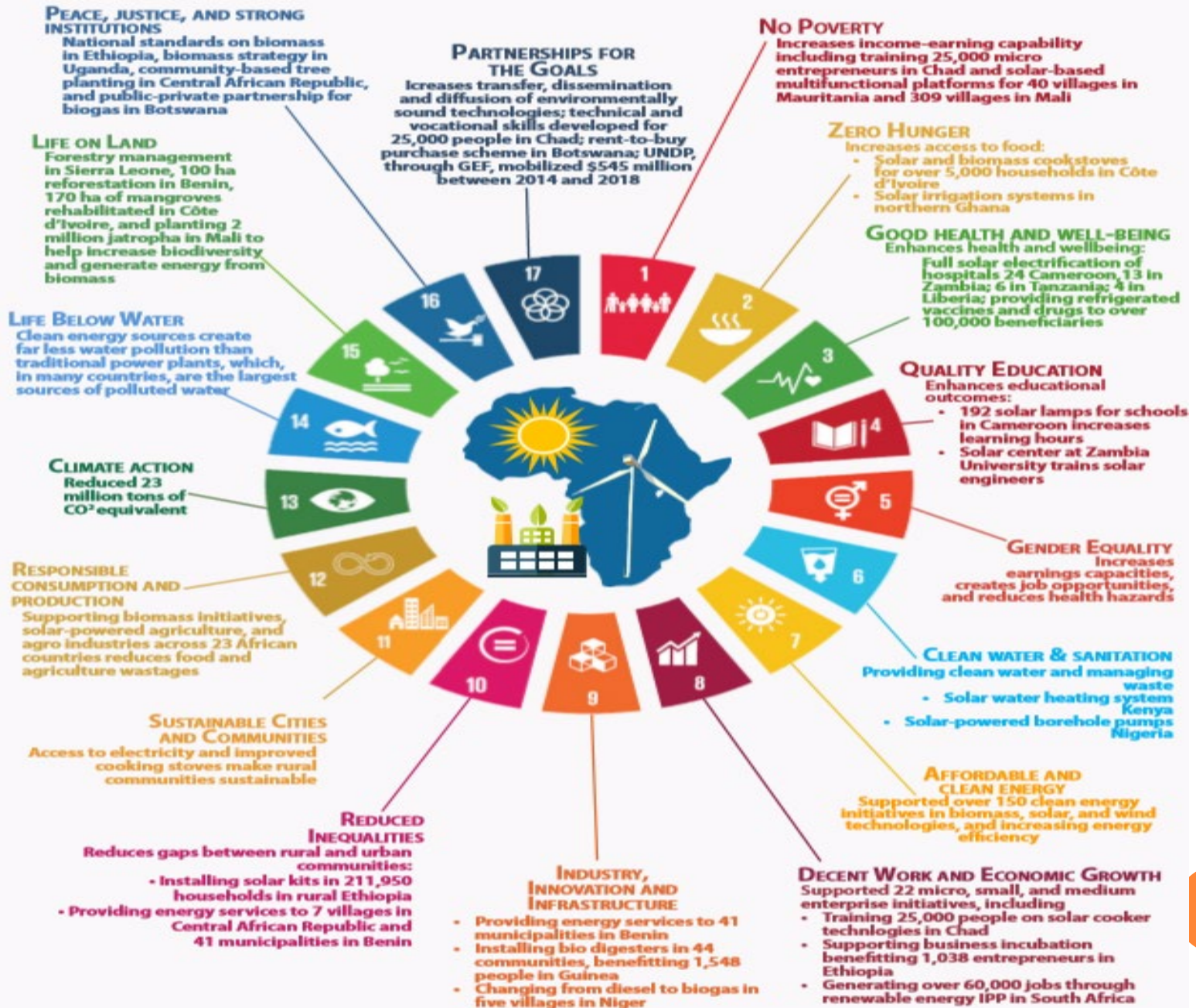
- According to the Energy Commission of Ghana, the national wood stock for fuel is estimated as 813 million tonnes.
- Approximately 18 million tonnes of woodfuel is produced annually.
- About 90 percent of the woodfuels are obtained directly from the natural forest and the savannah woodlands.
- The remaining 10 percent is obtained from logging and sawmilling waste.



# PROSPECTS OF ENERGY GENERATION FROM BIOMASS

- Biodiesel production from oil palm fruit has also increased over the last decade.
  - This has led to the classification of Ghana as one of the potential leaders in biodiesel production in Africa.
  - Of all the factors mentioned in support of the use of biomass for energy, the most important is its contribution to the achievement of the sustainable development goals in Africa.
  - The UNEP has thankfully put out a chart how Africa can achieve the SDGs through the use of bioenergy and these hold true for Ghana too.
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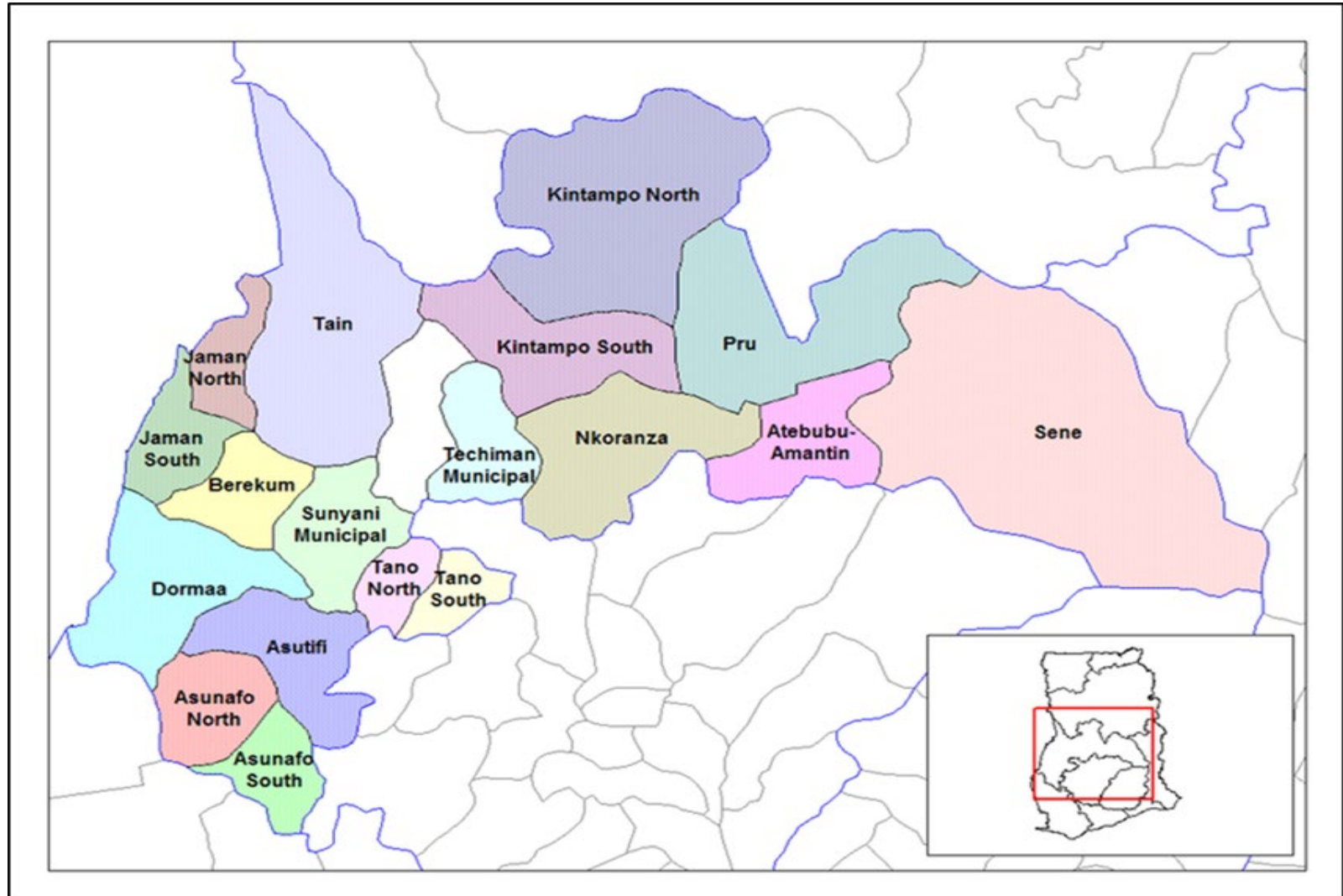


# BIOMASS POTENTIAL IN BONO AND AHAFO REGIONS

- They are found in the transition zone which is one of the main production areas in Ghana.
- Charcoal and firewood provide jobs for many rural areas in the region.
- There have been significant shortfalls in production due to resource depletion and deforestation.
- This is affecting many rural families who rely on woody biomass production as an alternative livelihood source in off-farming season.



# BONO, BONO EAST AND AHAFO REGIONS IN GHANA





# CHARCOAL MARKET IN SUNYANI, BONO REGION



# BIOMASS POTENTIAL IN BONO AND AHAFO

- Sustainable management of woodlot species in plantations and agroforestry programmes could restore degraded landscapes, ensure regular supply of woody biomass, reduce biodiversity loss and offset carbon emissions by serving as carbon sinks.
- This strategy could provide secured livelihood opportunities for many rural communities and women in particular who struggle to take care of themselves and their families.
- Majority of producers of woody biomass are women.





# COMMUNITY AGROFORESTRY WOODLOT

*Azadirachta indica* (Neem)



*Acacia mangium*

*Khaya senegalensis* (Mahogany)



*Anogeissus leiocarpus* (Kane)



# BIOMASS POTENTIAL IN BRONG AHAFO

- Woodfuel production is an important strategy for poverty alleviation.
- It could also help to reduce gender and cultural based inequalities and their effect on access to and utilisation of woodfuels.
- Woodfuel production could significantly contribute to climate change mitigation and adaptation.
- The potential of woodfuel producers to adopt short-rotation tree species on tree farms as a source of wood for charcoal and firewood production instead of relying on natural forests to provide the bulk of their resources would reduce the rapid rate of deforestation



# **NURSERY PROVIDING TREE SEEDLINGS TO SUPPORT AGROFORESTRY**

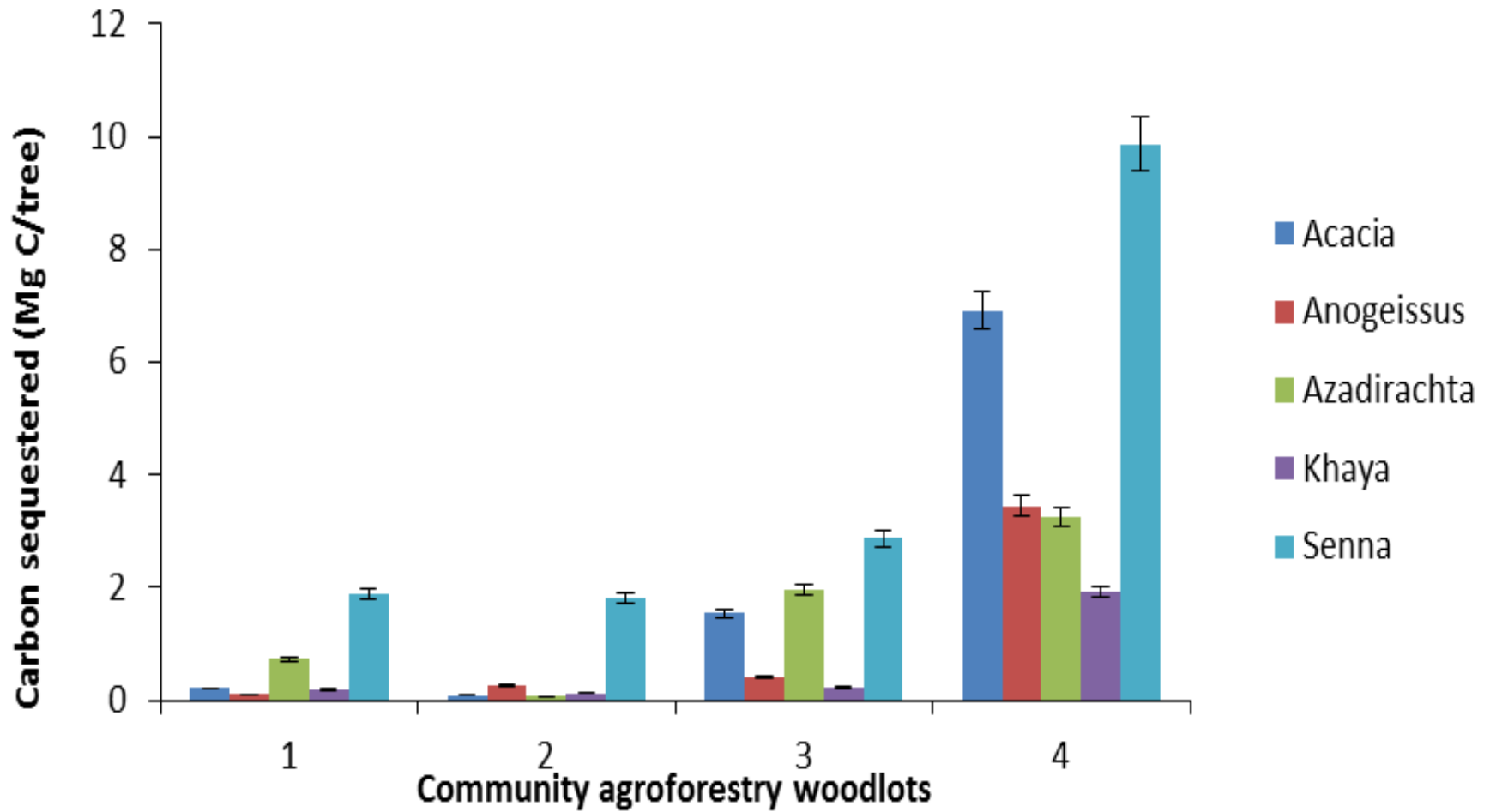




# COMMUNITY AGROFORESTRY WOODLOTS



# CARBON SEQUESTERED BY TREE SPECIES IN THE FOUR COMMUNITY AGROFORESTRY WOODLOTS.



# MARKETING OPPORTUNITIES IN WOODY BIOMASS

- Charcoal is widely used in Ghana and exported
- The production of biomass pellet feedstock is emerging as an attractive venture with increasing market value and end uses.
- Based on the sources of biomass pellet production, the biomass pellets market is segmented into wood sawdust, agricultural residue, and others.
- The biomass pellets usage is classified into power generation, industrial heating, commercial and domestic heating.





# ROADSIDE MARKETING FOR CHARCOAL



# TRUCKS CARRYING CHARCOAL TO URBAN AREAS






# REGIONAL TRENDS IN BIOMASS PELLETS MARKET


- Biomass pellets market will grow across various geographic regions such as North America, Latin America, Europe, East Asia, South Asia, and the Middle East & Africa (MEA) as efforts are stepped up to improve alternative fuels.
- Ghana is well positioned to embrace this initiative as many of our agricultural produce could be used effectively for such purposes.
- There is availability of these types of biomass from agricultural products and their residues including sugarcane, maize, rice, cocoa, oil palm, coconut, sorghum and millet processing.



# SUSTAINABILITY OF BIOMASS RESOURCES

- The support from government, state regulators, cost efficiency and low environmental impact, and the staggering improvements in technology are chiefly driving the market growth.
  - Increasing government effort to promote adoption of biomass energy and commercial energy generation to meet the rising energy demand
  - **Strengthening regional and international co-operation and integration** to facilitate large-scale biomass production and transmission
  - **Better management of biomass resources** for effective use and revenue generation.
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# SUSTAINABILITY OF BIOMASS RESOURCES

- Moreover, government support, such as funding programs and government grants, tax reliefs and investment subsidies play a significant role in triggering the growth of the market.
  - Adoption of biomass recovery and its conversion to energy source could offer industries with various benefits that include high-efficiency potential, waste volume reduction, hygienic disposal of waste, power generation and low cost of capital involvement.
  - Implementing policies and measures supporting sustainable biomass production and utilization as well as export.
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# **4<sup>TH</sup> GRADUATION CEREMONY WAS GRACED BY THE PRESIDENT OF REPUBLIC OF GHANA, HIS EXCELLENCY NANA AKOFU ADDOH**





# GRADUATION CEREMONY





# THANK YOU FOR YOUR ATTENTION

