Unlocking Africa's Bamboo Value Chain for Sustainable Development

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Salutations

- The Honourable Minister of State for Environment
- The Vice-Chancellor, Nnamdi Azikiwe University
- The Director Federal Department of Foresstry
- All other Principal Officers of the University
- Government Representatives
- Representatives of INBAR & other Non-Governmental Organisations
- Students
- Invited Guests
- Gentlemen of the Press
- Distinguished Ladies and Gentlemen
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Greetings from Dominion University, Ibadan



Appreciation

- I feel highly honoured to be invited to deliver this keynote address at this auspicious occasion marking the commissioning of the Sahelian Centre for Bamboo Research & Entrepreneurship Development (SIBRED)
- I heartily congratulate Nnamdi Azikiwe University for blazing the trail by establishing this long over-due centre, one of its kind not only in Nigeria but in Africa
- I also salute Dr John Agbo, the pioneer Director of the Centre and a trail blazer himself

Outline of My Presentation

- A Brief Introduction to Bamboo
- Definition of Terms- ‘Unlocking potentials’ & ‘Sustainable Development’
- Africa’s Bamboo Resources & Uses
- Modern Uses of Bamboo
- Bamboo Value Chains for Sustainable Development in Africa- Examples
- Recent Advances in Bamboo R&D in Nigeria
- Unlocking Africa’s Bamboo Value Chains for Sustainable Development- The Challenges
- Unlocking Africa’s Bamboo Value Chains for Sustainable Development- The Ten ‘Musts’
- What Can SIBRED do to Help Unlock Africa’s Bamboo Value Chain?
- Conclusion

What is Bamboo?

- Bamboo currently grows almost everywhere on Earth
- It falls under the category of grass and holds the title for being the fastest growing plant with recorded growth rates of up to 1m/day for some species
- It is one of the most versatile plant species possessing both the strength of hardwood and the sustainability of grass
- It thrives and grows in a diverse range of climates
- Its ancient origin is believed to be China and there are about one thousand five hundred known species

Bamboo comes in Different Shapes, Sizes & Colours



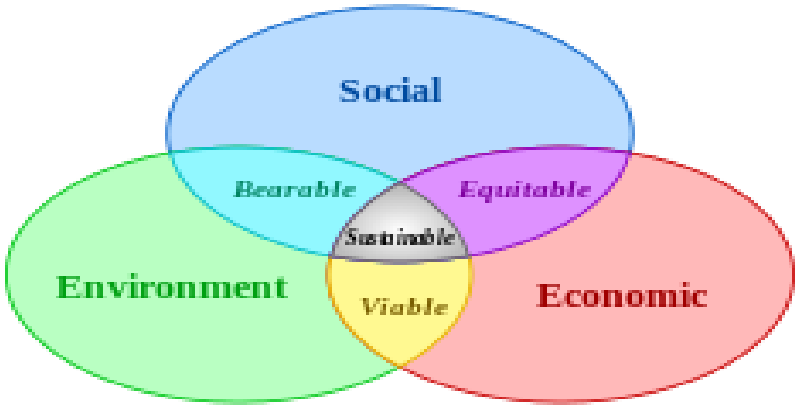


Unlocking 'Bamboo's' Potential

- Unlocking potential means turning '*shoulds*' into '*musts*'
- Agronomists believe that bamboo can restore degraded landscapes while economists think that is a potential "green gold," and a silver bullet for design and architecture that is already attracting a global market
- Currently, bamboo supplies a global trade worth an estimated US$2 billion per year. The lion share is earned by Asian countries
- Unfortunately, bamboo potentials have remained largely unexploited in Africa

Sustainable Development

- Sustainability is made up of three pillars: economy, society, and the environment



- Sustainable development as defined in the World Commission on Environment and Development's 1987 Brundtland report ´*Our Common Future*` is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs"
- **The Big Question: Can bamboo value chain be unlocked for sustainable development in Africa?**

Africa's Bamboo Resources

- Bamboo resource is widely distributed around the world in diverse climatic & ecological settings
- Its range covers the tropics, subtropics, temperate and frigid zones -a total area of about 37 million ha worldwide or around 1% of the global forest resource
- China is the richest country in bamboo followed by India. Both countries together have more than half of the total global bamboo resources
- Up to 36 countries in Africa have natural bamboo-growing regions
- Ethiopia's estimated one million hectares of natural bamboo forest is the largest in Africa, representing about 67% of all African bamboo
- Bamboos are available in all the 36 States of Nigeria. However, 14 States are very well endowed, i.e., Abia, Akwa Ibom, Anambra, Cross River, Delta, Ebonyi, Edo, Enugu, Imo, Ogun, Ondo, Osun, Oyo, and River States

Traditionally Uses of Bamboo in Africa

- In many African countries, bamboo is used to make mats, baskets, fencing poles, furniture and a variety of building and roofing materials, canoes, fishing kits, scaffolding material, door and window frames and window blinds, fences, & toothpicks






- Bamboo is also used as a source of food, medicine, tools, musical instruments, weapons, et c

Modern Uses of Bamboo

- There are nearly 10,000 uses of bamboo in China and other Asian countries
- The latest commercial bamboo products range from school desks, to pencils, rulers, water pipes, veneers, floor tiles, panels for walls bicycles, cars, trucks, a











Modern Uses of Bamboo









Bamboo Value Chain for Sustainable Development in Africa

- A value chain refers to the full lifecycle of a product, including material sourcing, production, consumption & disposal/recycling
- It is the process by which businesses receive raw materials, add value to them through production, manufacturing, and other processes to create a finished product, and then sell the finished product to consumers
- Bamboo value chain —from farmers to markets— can aid sustainable development in Africa in several ways

Commercial bamboo farming



- Bamboo cultivation - planting, maintenance and harvesting - has the potential to create thousands of jobs
- Depending on species, bamboo plantations can remain productive for more than 50 years
- A bamboo plantation of 1000 hectares can provide about 30,000 tons of wood resources, and thus render unnecessary the cutting of over 50 thousand hardwood trees per year
- A small bamboo plantation of one hectare could provide work and income for a whole family. Medium sized plantations of several hundred hectares could provide sufficient bamboo for local cottage industries. Larger plantations of several thousand hectares can indefinitely supply high quality raw material for various industrial uses

Bio-Fertilizer Production







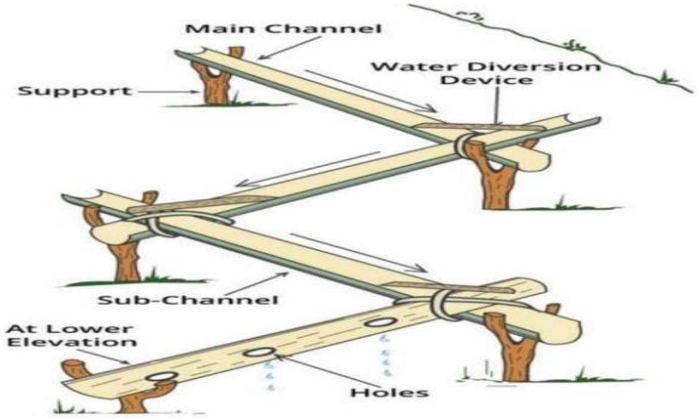
- Agriculture has a massive social and economic footprint in Africa. It provides employment for about 2/3 of the continent's working population and an average of 30-60 % of GDP & about 30 % of the value of exports
- However, African agriculture is characterised by low levels of productivity and fertilizer application. For example, Sub-Saharan Africa has an average fertilizer application rate of 22kg/hectare, compared to a world average of 146 kg/hectare (7 times higher)
- Again, Africa is dominated by family farming, - about 33 million farms of less than 2 hectares, accounting for 80% of all farms
- Ground bamboo charcoal (biochar) is a form of organic fertilizer that can be used to address the challenge of fertilizer supply to small-holder farms across Africa

Irrigation Water Supply

- Availability of adequate water resources for agriculture is essential for increased production, but only 6% of African farms are irrigated against a world average of 17%.
- Efficient use of water in Africa may not require large scale, energy-intensive irrigation schemes. Small pumps have had an important beneficial effect on irrigation in some African countries for vegetable and rice production. Where surface water is available this technology represents a well distributed and energy efficient option.
- Bamboo is a relatively cheap material for water conveyance compared to other piping materials







Bioenergy Products





- A majority of sub-Saharan African households use firewood or charcoal made from timber for cooking, often leading to deforestation, land degradation and indoor pollution
- However, the massive harvesting of wood for charcoal production is becoming unsustainable
- Bamboo provides a clean and renewable energy alternative in the form of charcoal and charcoal briquettes for domestic and industrial use. Bamboos are easier than wood to process for charcoal making. Besides, bamboo charcoal offers a cleaner, more consistent alternative to firewood, in terms of higher energy density and steady combustion. Bamboo charcoal burns longer and produces less smoke and air pollution than wood charcoal



Substitute Wood Products





- There is a growing unmet demand for wood products across Africa partly due to wood scarcity
- Bamboos mature faster than wood; they are easier to harvest, transport and process; they are lightweight, durable and flexible; they accept paints and stains like wood; they possess structural properties sufficient for the demands of diverse handicraft and furniture products; and they can be worked into many styles
- The challenge of wood scarcity can, therefore, be readily addressed by substituting wood with bamboo in the production of furniture, floor parquet, wall siding, match stick, tooth pick, plywood, particleboard, fibreboard, tissue paper, writing paper, paperboard, et c



Eco-Friendly Construction Material

- The challenges of urbanisation and the attendant consequences on housing provision are widespread in Africa
- Portland cement is one of the predominant materials for the construction of houses in Africa
- Two of the challenges associated with the use of Portland cement in building construction is its escalating cost of and the global concerns about CO2 emissions associated with its production
- One way of addressing these challenges is by partial replacement of Portland cement with pozzolans- materials that have little or no cementitious properties in themselves but, when finely ground, will chemically react with calcium hydroxide in the presence of water to form cementitious a product
- Bamboo leaf ash can be used to partially replace Ordinary Portland cement by 10 to 20%

Recent Advances in Bamboo R&D in Nigeria

- One way of promoting rapid standardization of bamboo and rattan products in Africa is by moving product manufacture from artisanal level dominated by semi-literate craftsmen to science-driven professional level
- A few institutions in Nigeria are already working on changing the narrative
- New forms of bamboo and rattan products, readily amenable to standardization, have been developed within the last 20 years as will be shown in the next few slides

Recent Advances in Bamboo R&D in Nigeria

- **Documentation of Basic Properties of Locally Grown Bamboo-** Quite a number of researchers have documented basic properties of *Bambusa vulgaris* found in different agro-ecological zones in Nigeria
- **Development of bamboo culm splitter**- Bamboo has to be split along the length for it to be laminated together to create a number of products. Motorised bamboo splitters available on the international market are not yet common in Nigeria. Manually operated splitters have been developed at the University of Ibadan (UI)
- **Development of bamboo composite roofing tiles** at UI
- **Domestication of Bamboo Bicycle Production Technology** at African University of Science & Technology (AUST), Abuja and UI
- **Development of production facilities for bamboo charcoal and charcoal briquette production** at UI








BAMBOO CEMENT
COMPOSITE ROOF

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Unlocking Bamboo Potentials in Africa- The Challenges

- Bamboo still suffers from an image problem – it has a poor reputation in many African communities as an invasive weed that is difficult to eliminate. Many farmers see it as a pest because it grows fast when in fact this is its real benefit
- The biggest challenge is lack of awareness. There is still a very low level of awareness in Africa of the modern innovations in bamboo processing and utilisation
- Un-Controlled Harvesting. There are no standard regulations guiding bamboo harvesting, and hence no effective control over the maturity of items harvested
- Lack of finances and absence of a national policy & strategy to develop and use bamboo resources are also hampering progress
- African governments also face the challenges of equipping farmers with bamboo planting and maintenance skills, supplying seedlings and teaming up with the private sector for processing and value addition

Unlocking Bamboo Potentials in Africa- The Ten 'Musts'

- 1. **Awareness Creation**: The first step toward change is awareness. The second step is acceptance. For modern bamboo products to be accepted, the public has to be informed and educated with the intention of influencing their attitudes, behaviours and beliefs towards bamboo.
- 2. **Research and Development**: We must invest in research to understand the local species of bamboo, their growth patterns, and their suitability for various uses. This could involve collaborations between research institutions, universities, and local communities.
- 3. **Cultivation and Farming**: We must promote bamboo farming by providing training, resources, and incentives to farmers. This includes educating them on sustainable cultivation practices, proper harvesting techniques, and efficient management of bamboo plantations.
- 4. **Processing and Manufacturing**: We must establish processing facilities for bamboo. This includes setting up facilities for bamboo treatment, such as drying, preserving, and laminating, as well as manufacturing units for producing various products like furniture, housing materials, paper, textiles, and even biofuels.

Unlocking Bamboo Potentials in Africa- The Ten 'Musts'

- 5. **Market Development**: We must identify and develop markets for bamboo products locally and internationally. This involves creating awareness about the benefits of bamboo, marketing its eco-friendly aspects, and demonstrating its diverse applications to potential buyers.
- 6. **Policy Support**: Governments can play a crucial role by formulating policies that support the sustainable growth of the bamboo industry. This could include offering subsidies, providing tax incentives, and implementing regulations that promote responsible harvesting and manufacturing practices.
- 7. **Skills Development and Employment**: We must offer training programmes to develop skills related to bamboo cultivation, processing, and product development. This can create job opportunities and empower local communities while fostering entrepreneurship.

Unlocking Bamboo Potentials in Africa- The Ten 'Musts'

8. Partnerships and Collaboration: We must encourage partnerships between government agencies, private sector companies, NGOs, and international organizations. Collaboration can bring in expertise, technology, and funding necessary for the growth of the bamboo industry.

9. Environmental Conservation: We must continue to emphasize the environmental benefits of bamboo cultivation, such as soil conservation, carbon sequestration, and biodiversity preservation. Highlighting these aspects can attract support from environmentally conscious consumers and investors.

10. Financial Support and Investment: We must attract investment in the bamboo value chain by showcasing its potential for high returns, especially in industries such as construction, furniture, and renewable energy.

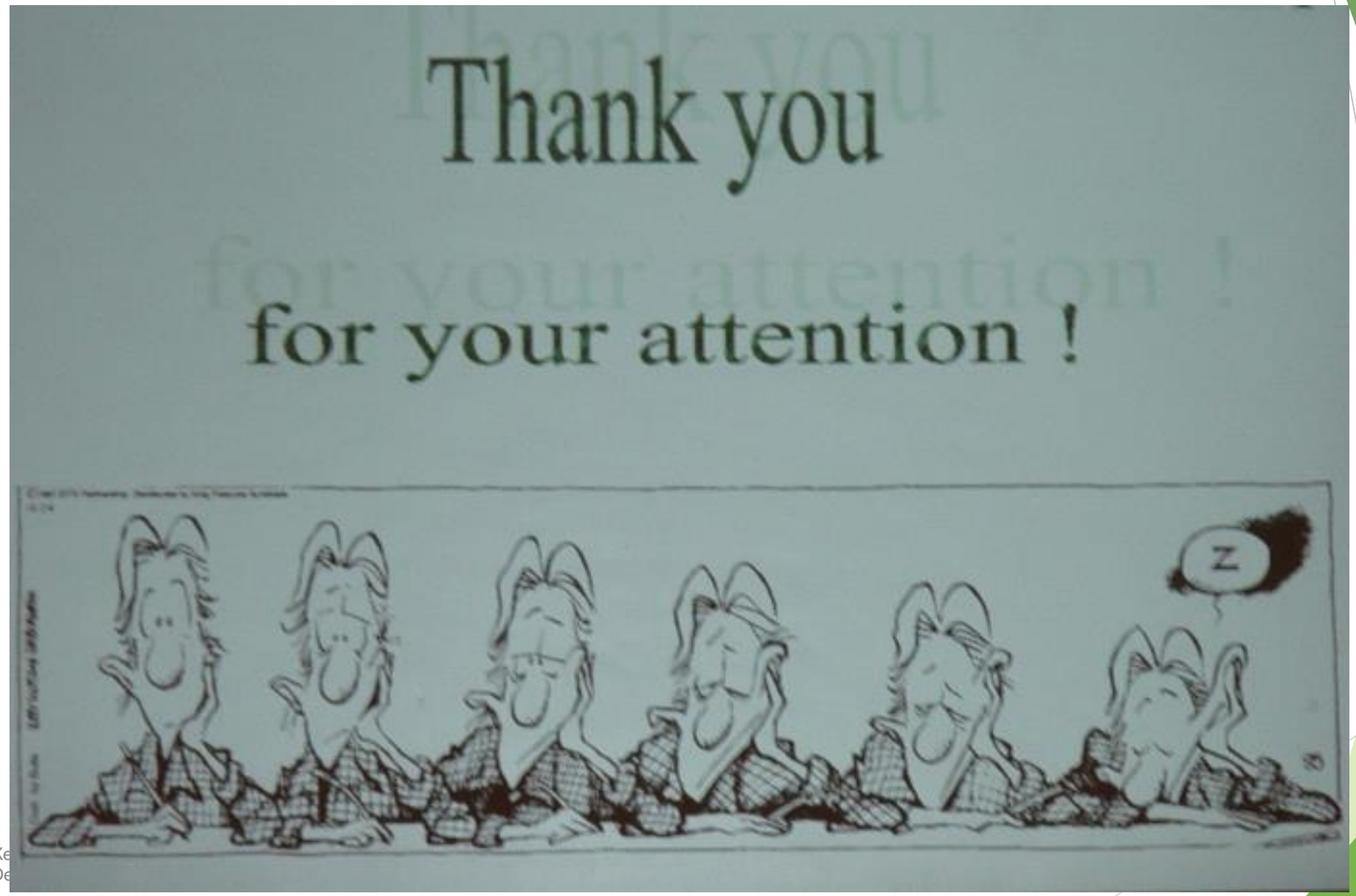
Indeed, it is time for the bamboo value chain to be unlocked in Africa!

What Can SIBRED do to Help Unlock Africa's Bamboo Value Chain?

- Promotion of modern bamboo silvicultural practices
- Publication of research briefs, extension notes, et c
- Annual technology fairs/exhibitions mounted to show-case new process and product innovations
- Regular dialogues with key players in the private sector, cognate government ministries, parastatals and agencies
- Empowering bamboo processors in the country & beyond through transfer of adaptable innovative processing technologies that meet international standards
- Supporting the National Bamboo & Rattan Growers, Processors and Marketers Association of Nigeria
- Supporting development of national & regional standards for bamboo products
- Collaborating with other insttutions in Nigeria & elsewhere in Africa on bamboo R&D

Conclusion

- African countries can unlock the full potential of the bamboo value chain, leading to economic growth, job creation, environmental sustainability, and the empowerment of local communities
- To fully benefit from the bamboo boom, the private sector needs to be at the heart of green economy development in order to drive demand and provide investment
- Value addition needs to be more innovative if African bamboo is to take the global market by storm.


Thank you
for your attention !
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Questions ???

Comments ?????