



# Forest Products Development

**Forest Products  
Processing, Value  
Addition and  
Technologies in  
Kenya**

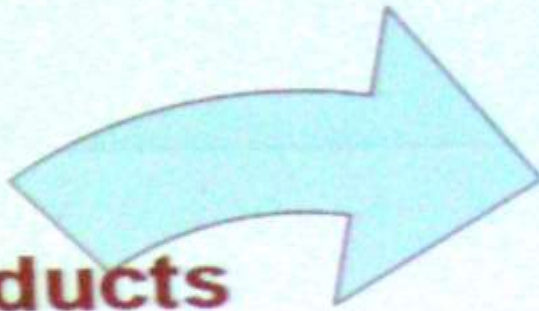
**Githiomi J., Muthike G.,  
Oduor N. and Muga M.**

**Commercial Forestry  
Investment Conference  
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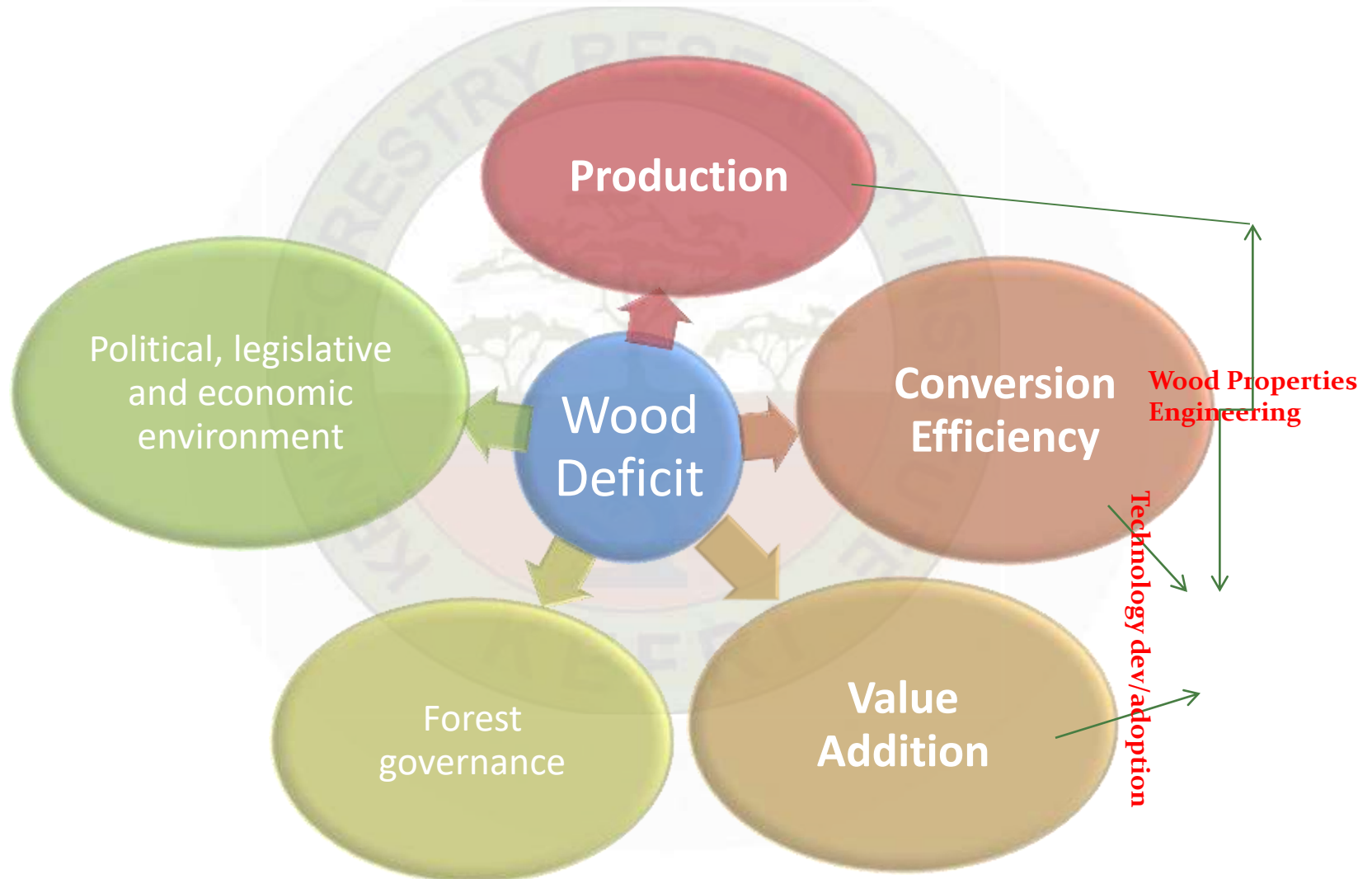
**Forest products  
science &  
technology**

**Forest  
science &  
forestry**

**Engineering;  
Biological,  
Physical,  
Social sciences**



# Timber Sector Drivers and Research Interventions



## Forest Products Supply/Demand Scenario (2013)

Product	Supply (m <sup>3</sup> )	Demand (m <sup>3</sup> )	Diff (m <sup>3</sup> )
Timber	7,363,414	5,262,624	2,100,790
Poles	3,028,907	1,409,482	1,619,425
Fire wood	13,654,022	18,702,748	(5,048,726)
Charcoal	7,358,717	16,325,810	(8,967,093)
<b>Totals</b>	<b>31,405,060</b>	<b>41,700,664</b>	<b>(10,295,604)</b>
<i><b>By 2032 [20% Projected demand]</b></i>			<b>(12,354,725)</b>

*Ministry of Environment, Water and Natural Resources, 2013)*

- ❖ **Opportunities** - Firewood and Charcoal
- ❖ **Responsibility** - Processing technologies
  - ❖ Increase recovery
  - ❖ Reduce emissions
  - ❖ Conserve forests

# Forest Products

- Wood products - timber, furniture, poles, posts, wood fuel, pulp, paper, wood composites, wood and carvings.
- Non-wood forest products - goods of biological origin other than wood
  - plant gums, resins, essential oils, dyes and tannins, \
  - indigenous fruits, medicinal and pharmaceutical plant products (FAO, 1992).
- About 42% of Kenya's GDP is from natural resource-based sectors (Kenya Green Economy Strategy Implementation Plan 2015)
- Forestry alone contributes about 36% (GOK, 2016)
  - ❖ Energy for industrial processes and domestic use
  - ❖ Materials for building and construction
  - ❖ Environmental services

# Focus

- Enhance supply of forest products
  - Farm forestry
  - Dry land forestry
  - Diversification of species
- Efficient processing and value addition
  - Incentives for investment
  - Increase value addition
- Protect local manufacturers from cheap/sub-standard imports



# Mechanical Wood Industry

- Mechanical wood industry consumption approx. 85%
- Classification(KFS, 2016);
  - 29 large-scale with Integrated production of over 20 m<sup>3</sup>/day (**R > 60%**)
  - 175 medium scale sawmills with sawn timber production 10 – 20 m<sup>3</sup>/per day(**60>R>55%**)
    - Relatively high recovering machinery
  - Over 400 small millers using outdated and low recovery equipment with (**20 to 35%**).



# Challenges in Timber Sector

- Disparities in Logging and outputs (Cost and safety)



Mechanized logging



Manual loading



Lift and carry

## Differences in Sawing efficiency (Output, safety & quality)





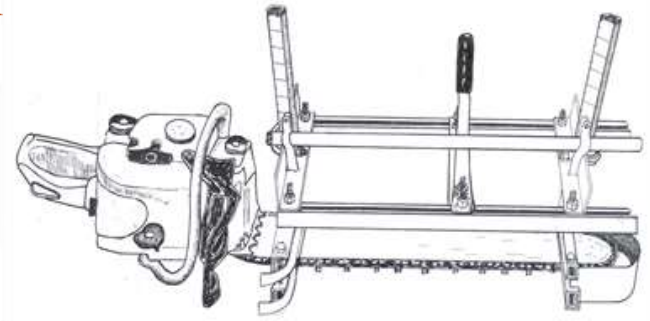
# Challenges in Timber Sector...

- Shortage in raw material (partly due to Moratoriums)
  - High timber prices of timber products from imports
  - Dilapidation of existing investment, Loss of employment
  - Slow growth of the sector
- Non adherence to set standards
  - Compromised standards and durability
  - Costly replacements
  - Inflated service charges (eg power connections)



# Interventions

- Efficient technology development and capacity building
  - Framed chain saw system –
    - Used on farms
    - Increases timber recovery from 23% to +50%; also improves timber quality and minimizes accidents
  - Timber Grading
    - Useful in construction and export markets
    - Gives additional value to sawn timber



# Opportunities and New Fronts in Timber

- Timber lamination
  - Lamination of thinnings and timber that would **not** ordinarily be used as structural timber
    - *There's improved strength through the use of glue lamination technology*
  - Lamination of timber workshop into high value composite products
    - Added value to pieces of timber





# Opportunities in Biomass Energy Sector

- **Charcoal briquettes from forestry and agricultural wastes**
  - ❖ Agricultural wastes from horticulture, food crops, industrial crops, livestock and fisheries
  - ❖ Energy products
    - ✓ Carbonised and non-carbonised briquettes – domestic and industrial use
  - ❖ There are a few briquetting enterprises in Kenya with potential for further growth





# Opportunities in Value Addition of Non-timber Forest products

- Major NTFPS in Kenya are: gums, resins, aloes and indigenous fruits.
- Increasing global demand for bio-products and nutraceuticals derived from NWFPs.
- The market for bio-prospecting is about 800 billion USD worldwide
- The potential for gum arabic and gum resins production in Kenya is about 10,000 MT and 8,000 MT respectively
- Kenya is the third largest exporter of resins (myrrh, hagar and frankincense)

# Some locally processed gums and resin Products



Gum arabic



Gum arabic – used food industry



Myrrh



Myrrh essential oil

# Opportunities in Aloe products

- About 60 species of aloes in Kenya
  - 5 commercially exploited for cosmetics and medicines
- Planting, harvesting and trade in aloes in Kenya is licenced by the Kenya Wildlife Service (KWS)
- ***Semi-processed*** Aloe (gum) exported mainly to China or Saudi Arabia at US \$ 2.1-3.2 per kg, depending on the quality.
- Locally, middlemen sell aloe gum to medium scale soap manufacturers for US \$ 0.9-2.1/kg.



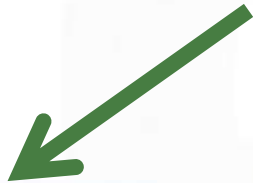
# Opportunities in Indigenous Fruits

- Indigenous fruits are a source of essential nutrients as well as a source of income
- Over 400 species of fruit plants in Kenya
- The seven most important indigenous fruits in their order of preference are:
  - *Tamarindus indica* (tamarind), *Adansonia digitata* (baobab), *Ximenia americana*, *Carissa edulis*, *Ancybotrys tayloris*, *Ziziphus mauritiana* and *Dialium orientale*.
  - Others *Vitex doniana*, *Vitex payos* and *Sclerocarya birrea* (marula).
- ***Resource availability to support industrial manufacturing***



# Some locally value added indigenous fruits : Baobab

Baobab fruit



Candied Baobab fruit

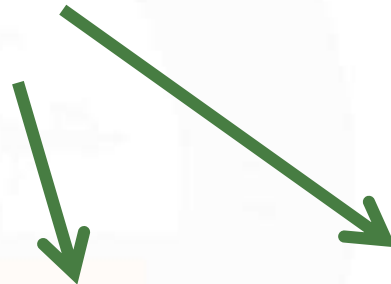
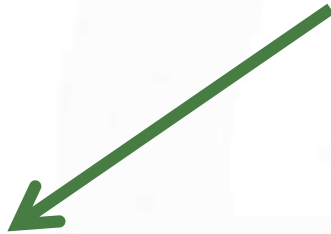


Processed baobab powder



Baobab seed oil

# Sclerocarya birrea – marula fruit



Marula jam



Marula fruit juice



Marula oil and marula moisturizer

Some locally value added indigenous fruits :

**Tamarindus**



Tamarind jam



Tamarind juice



Tamarind sauce

# Untapped Opportunities

- Tooth picks
  - ✓ From timber byproducts (shorts + offcuts)
  - ✓ From bamboo culms
- Matches
- Essential Oils
  - ❖ Eucalyptus oils
  - ❖ Leleshwa oils



## Summary Challenges

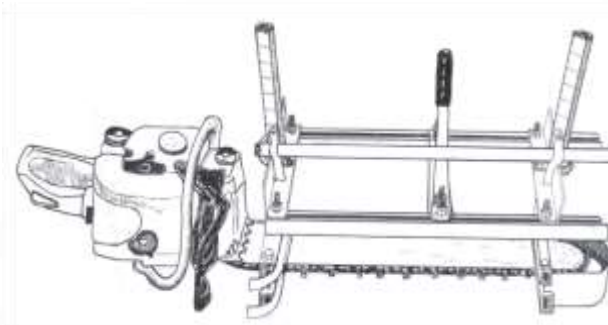
- There are several challenges of the value chains that can be broadly classified as:
  - Resource supply,
  - Technological,
  - Human resource capacity/skills,
  - High investment costs,
  - Competition from imported products,
  - Poor market linkages and
  - Inadequate policy and legal framework

## Conclusion cont.

- Management of knowledge systems and information sharing on forest business opportunities
- Support to Forest based industry...
  - Regular resource assessment and mapping to ensure sustainability
    - Forest plantation development and quality control
    - Farm forestry and tree species domestication initiatives
    - Dryland forestry development and species diversification
    - Tree breeding for purpose
  - Enhancing forest based business through incubation mechanisms
    - Standardized production and value addition
    - Marketting and market linkages

## Conclusion cont.

- Analysis of value chains for equitable benefit sharing
  - Product quality assurance along the value chain
  - Value addition and price changes
- Sustainability of **resource base** should be **enhanced** through promotion of **plantation development**, integrated harvesting and efficient processing
- **Enhancing capacity** of producers, processors, traders and other stakeholders in the value chains on sustainable harvesting, post-harvest handling, value addition and marketing.
- Development of **relevant policies and regulations** to enhance value chains development



**Thank You  
for Your  
Attention**





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