



Forest Products Development

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

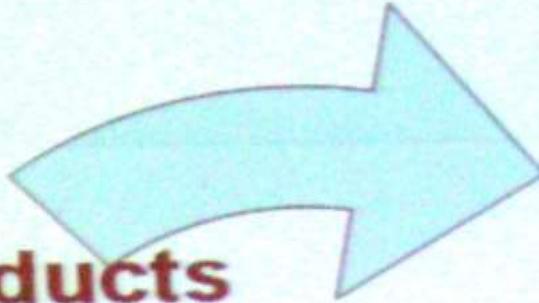
**Githiomi J., Muthike G.,
Oduor N. and Muga M.**

**Commercial Forestry
Investment Conference
November 2021**

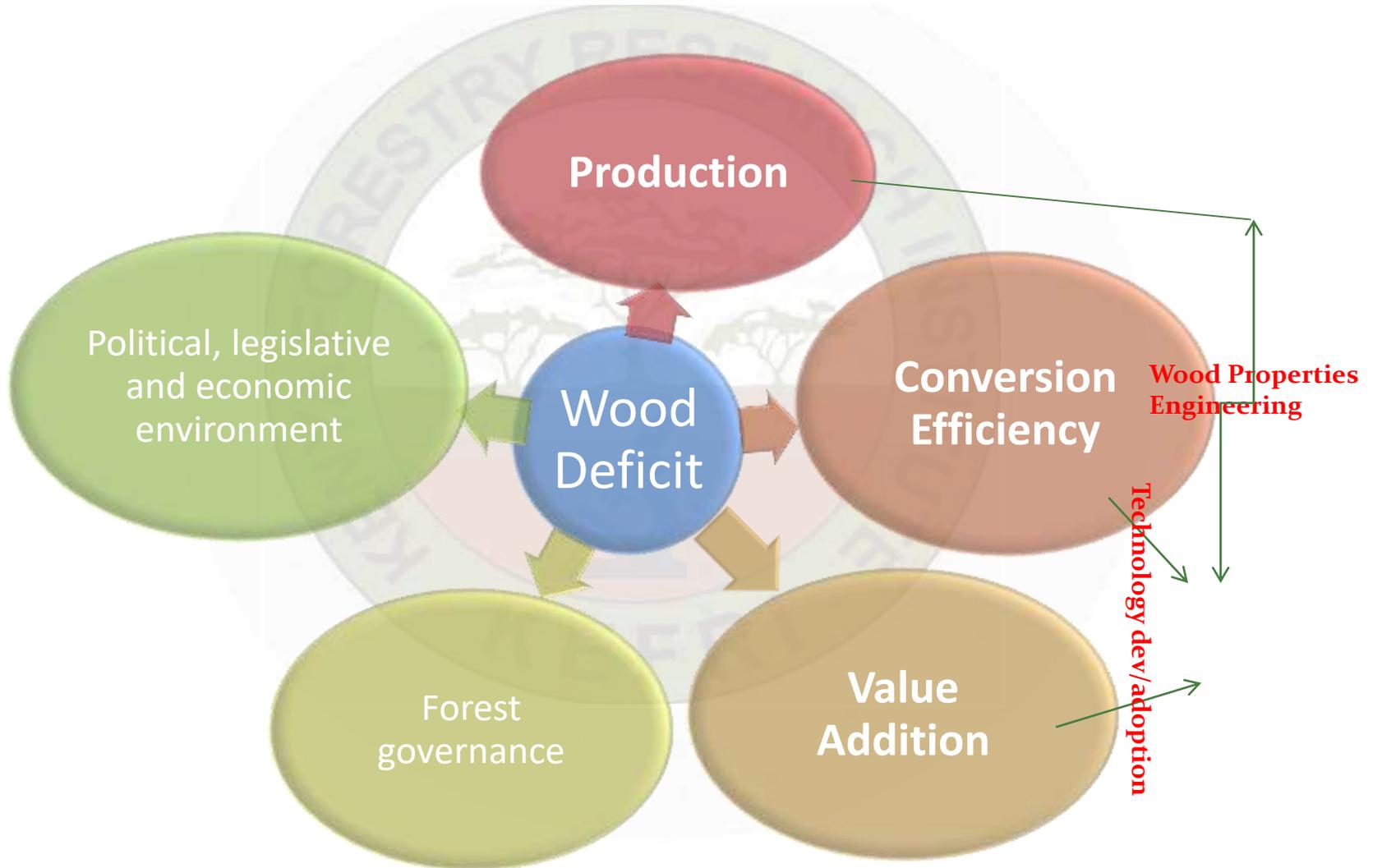
**Forest products
science &
technology**

**Forest
science &
forestry**

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



Timber Sector Drivers and Research Interventions



Forest Products Supply/Demand Scenario (2013)

Product	Supply (m ³)	Demand (m ³)	Diff (m ³)
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)
Totals	31,405,060	41,700,664	(10,295,604)
<i>By 2032 [20% Projected demand]</i>			<i>(12,354,725)</i>

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 m³/day (**R > 60%**)
 - 175 medium scale sawmills with sawn timber production 10 – 20 m³/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)



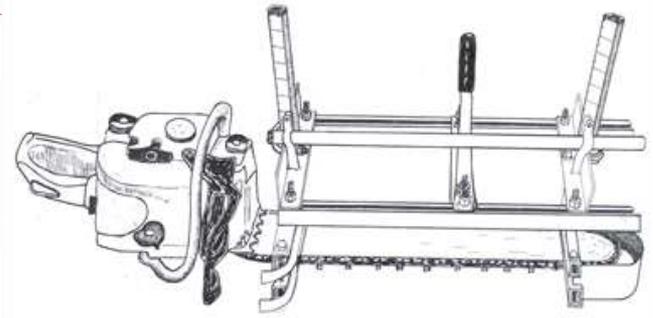
Challenges in Timber Sector...

- 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

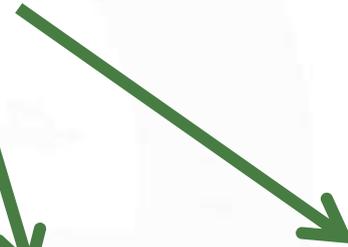
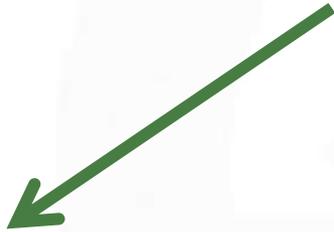


Processed baobab powder



Baobab seed oil

Sclerocarya birrea – marula fruit



Marula jam



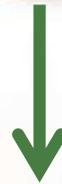
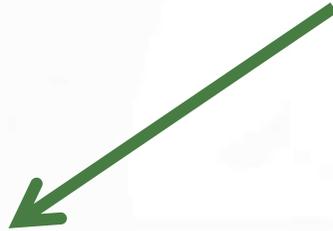
Marula fruit juice



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

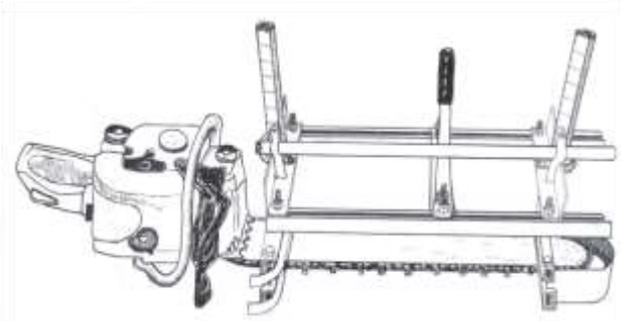
- There are several challenges of the value chains that can be broadly classified as:
 - Resource supply,
 - Technological,
 - Human resource capacity/skills,
 - High investment costs,
 - Competition from imported products,
 - Poor market linkages and
 - Inadequate policy and legal framework

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
 - Marketing 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**



CONTACT DETAILS



P.O. Box 20412 – 00200
Nairobi, Kenya



+ 254 722 157 414
+ 254 724 259 781/2



director@kefri.org



kenya forestry research institute



@KEFRIHQ