African Forest Forum

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The potential for all-inclusive public private partnerships in Zimbabwe's forest sector

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Correct citation: Katsvanga K., and Mudyiwa S (2019). The potential for all in-inclusive public private partnerships in Zimbabwe's forest sector. AFF Report. African Forest Forum, Nairobi.

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The potential for all-inclusive public private partnerships in Zimbabwe's forest sector

Katsvanga Cuthbert A T and Mudyiwa Silas M

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ACRONYMS AND ABBREVIATIONS

AFF	African Forest Forum
ASSP	Agricultural Services Support Programme
BKAZ	Beekeepers Association of Zimbabwe
CBE	Community Based Enterprises
CBO	Community Based Organisation
CIFOR	Center for International Forestry Research
CLFPA	Communal Land Forest Produce Act
CFF	Commercial Farm Forests
CFP	Commercial Forest Plantations
CLFW	Communal Land Forests and Woodlands
EMA	Environmental Management Agency
FSC	Forest Stewardship Council
FTLRP	Fast Track Land Reform Programme
ISO	International Standards Organisation
JMFRS	John Meikle Forest Research Station
NGO	Non-Governmental Organisation
PFP	Primary Forest Production
PWLMA	Parks and Wildlife Management Authority
NTFP	Non-Timber Forest Products
PPP	Public Private Partnerships
QA	Quality Assurance
RAP	Rural Afforestation Programme
RDC	Rural District Council
SAA	Sustainable Afforestation Programme
SAFIRE	Southern Alliance for Indigenous Resources
SAZ	Standards Association of Zimbabwe
SFP	Secondary Forest Production
SHE	Safety, Health and Environment
SME	Small to Medium Scale Enterprises
TIMB	Tobacco Industries Marketing Board
TPF	Timber Producers Federation
TSURO Trust	Towards Sustainable Use of Resources Organisation Trust
UNICEF	United Nations International Children's Emergency Fund
ZLT	Zimbabwe Leaf Tobacco

EXECUTIVE SUMMARY

The development of an organised private sector in forestry, including the identification and promotion of Public Private Partnership (PPP) models for all-inclusive, forest compatible development and sustainable livelihoods support can potentially revive the Zimbabwean economy which has been affected by hyperinflation, among other factors. In terms of private sector development, Zimbabwe had nurtured a vibrant and organised forest plantation system until 2000. The sector is regulated by the Forestry Commission and the Timber Producer's Federation (TPF). The TPF ensures that best practices are adopted.

Zimbabwe's forest sector has four management categories: commercial forest plantations (CFP), commercial farm forests (CFF), gazetted forests (GF) and communal lands forests and woodlands (CLFW). Actors within CFPs are big forestry, sawmilling and manufacturing companies whose interests are in meeting national and regional timber and timber products demands. Out-growers and contractors (mainly involved in silviculture, harvesting and sawmilling) are also actors in CFPs. Other actors within the CFPs sector are commercial agriculture farmers who grow trees for construction purposes, tobacco curing and sale to established CFPs. Main actors in GFs are the Forestry Commission (state forest authority), concessionaires and Rural District Councils (RDCs) as well as surrounding communities involved in joint forest management (JFM) arrangements. Management objectives for GFs are conservation of the Kalahari sands, and commercial exploitation of the indigenous hardwoods. The CLFW, with negligible management, are exploited by communities for fuelwood, non-timber forest products (NTFP) and construction material. Principal actors within the CLFW category are the communities, non-governmental organisations (NGOs) and government departments.

Gender representation is such that about 64% (combined agriculture and forestry) and 83% (forestry separated) women are employed in the CLFW, CFF and CFPs at grassroots level as general hands. Within timber processing and manufacturing sectors, the representation of women is as low as 23.45% due to the menial nature of the work.

Most global, regional, and national forest laws and related polices facilitate the development of sustainable forestry in Zimbabwe. The policies and legislation have emphasis on conservation, sustainable use of forest resources and climate change mitigation. One policy which needs review is the restrictive Communal Lands Forest Produce Act (CLFPA). However, communities bypass its provisions to enable sale of forest produce and in return manage valuable forests and woodlands.

Forestry Sector production trends have shown a decline from the late-1990s. If this decline continues, the country may lose valuable forests to illegal settlers who cause forest fires which have destroyed significant forest resources over the last two decades. Zimbabwe is experiencing economic challenges and forest companies, like the rest of the primary and manufacturing sectors, are operating below capacity and even unable to service bank loans, pay employee wages and recapitalise. For the CLFWs, there has been overdependence on forest resources resulting in extensive forest degradation and deforestation. Farming is unreliable due to high input costs and

rainfall unpredictability because of climate change. Forests and woodlands thus suffer the *'tragedy of the commons'*. Interventions through PPPs may potentially avert overexploitation of the forest resources and vitalise the forestry sector.

Potential PPPs within the CFPs include out-grower/contractor and established farmers for the provision of services in silviculture, harvesting, sawlog and pulpwood production. The state-owned timber companies and GFs can have partnerships with the private sector to enhance their productivity and sustainability since they are currently involved in more of exploitation than planting activities. In GFs, concessionaires do not have enough capacity to exploit the indigenous hardwoods hence the need for engaging private partners. Within commercial agricultural farms, more land can be allocated to outgrowing to facilitate partnerships with timber companies to increase the resource base. In CLFW, possible models would be through JFM arrangements with NGOs as private partners for the sustainable management of the forest and woodland resource. This will enhance NTFP production and development of suitable CBOs.

1.INTRODUCTION AND OBJECTIVES OF STUDY

1.1 Introduction

The purpose of this study was to facilitate the development of public-private-partnerships (PPPs) in forestry ranging from community forest associations, small to medium scale enterprises (SMEs) to large companies involved in value addition, marketing, and utilisation of forest products. The study also sought to identify and promote promising sustainable livelihood development PPP models and to strengthen the capacity of the industry to address social and environmental concerns which contribute to inclusive, equitable and effective private sector development.

1.2 Specific objectives

(i) To map out key actors in forestry and identify gender groups' representation in primary forest production (PFP) and secondary forest production (SFP) in all forest types in the country.

(ii) For actors in PFP, to collect information on raised/managed tree species such as distribution by area, age classes and volume (total and merchantable) as well as plans for sustainable supply.

(iii) For actors in SFP, to collect information on industry type, installed capacity, product lines, capacity utilisation, production volumes (in the last five years) and raw material types and sources.

(iv) For both actors in primary and secondary forest production sector to: -
- evaluate employment opportunities, policies, regulations, and other factors facilitating or constraining the development of forest products industry, including undertaking a SWOT analysis.
- assess gender specific inequalities.
- assess factors inhibiting or promoting the full and equal participation of marginalised groups.
- analyse gender-based control and access to required assets or resources including specific opportunities, challenges and privileges of involvement and participation in the sector.
- evaluate marketing, domestic, and international trade volumes, production costs and revenues of products traded in the last five years.

(v) To evaluate the linkages among actors in PFP; and the relationships among actors in SFP; and analyse how these can be organised to contribute to the growth of a well-organised formal private sector.

(vi) To evaluate the scope for PPP including existing promising approaches that can enhance social inclusion, gender equity, and sustainable livelihoods development in the forest types and propose recommendations.

(vii) To provide past trends on production, trade, and consumption of timber and non-timber products in the country in the last five years as well as future production, trade, and consumption forecasts.

(viii) Assess the contribution of private forestry sector activities to local livelihoods and the national economy.

2. BACKGROUND AND JUSTIFICATION

The study was necessitated by the decline of the forest sector in Zimbabwe from the late 1990s after the introduction of the Fast-Track Land Reform Programme (FTLRP) and the economic meltdown. The commercial forest sector which had grown to the level of certification (ISO 9001, ISO 14000 and FSC) lost sustainability. Timber companies operate below capacity to the extent of failing to pay employee wages, recapitalise and carry out essential silvicultural operations and re-establish harvested compartments. Commercial farm occupants lack tree re-establishment and management capacity, and either sell the valuable timber as tobacco curing fuelwood or lose it to wildfires. Gazetted forests have been occupied by illegal settlers, and just like forest plantations and concessionaires they do not have the capacity to effectively exploit the hardwood resource. The communal land forests and woodlands have been subjected to the *'tragedy of the commons'* since they act as livelihood fall-back for rural communities which profoundly depend on them in times of crop failure. Communal land forests and woodlots therefore continue to experience massive deforestation and degradation. Therefore, it appears that private public partnerships established by multiple common interests and all-inclusive actors in the forest sector could potentially revitalise the industry.

3. METHODOLOGY

3.1 Materials

The study required transport, ICT infrastructure, and stationery.

3.2 Methods

3.2.1 Key actors' identification

The methodology applied for the study was qualitative with variable approaches for each objective. To map the key actors and gender groups in the forest sector at various levels, a review of literature was conducted. The identified groups were used to snowball into organisations associated with them such as NGOs, individual farmers, and government agencies which work directly with grassroots organisations. Information was collected through key informant interviews and focus group discussions. Data were collected through checklists and interviews from government departments and parastatals, such as the Forestry Commission, Allied Timbers, the Environmental Management Agency (EMA) and the Parks and Wildlife Management Authority (PWLMA). From the private forest sector, the Timber Producer's Federation (TPF) was central to the identification of registered and known non-registered actors.

Mapping of key actors at secondary level was done through the identification of community enterprises, individual entrepreneurs, private industries, traders, transporters, state enterprises, community-based enterprises, and regional blocks by use of an interview checklist. Thirty-four actors were identified as out growers, silviculture, logging and sawmilling contractors, concessionaires, and secondary

processors like furniture manufacturers, as well as community NTFP producers and marketers.

3.2.2 Primary production

To identify grown and managed tree species, the Forestry Commission, the TPF and private company databases and inventory records were consulted. The areas, age classes and volumes were noted from inventory records while species preference was recorded from company planning departments. For CLFWs and CFFs, interviews by checklists were used. Five major tree species for each category were distinguished.

3.2.3 Processing

Major processing industries identified from the TPF database were sawmills, fibre and particle board, pulp and paper, charcoal kilns, commercial and wood product plants. Three major NTFPs were identified from the Forestry Commission and NGOs such as Environment Africa, Southern Alliance for Indigenous Resources (SAFIRE), Phytotrade Africa, and Beekeepers Association of Zimbabwe (BKAZ). Data was collected through interviews and database checks.

3.2.4 SWOT analysis

Since Zimbabwe is a developing country with variable uses of forest products, a SWOT analysis was undertaken to assess both internal and external factors which either enhance or hinder the successful implementation of PPPs to enhance the establishment of a vibrant forest sector. Such factors were considered at local, national, and regional levels based predominantly on literature review from CIFOR studies. For the major five timber products and three NTFPs, marketing and trade were evaluated at national scale through the assessment of supply and demand from a market survey, as well as through value chain analysis. Gender analysis by forest product sector was undertaken to determine the engagement and distribution of women in the forest sector and how this compares across sectors in the country and the region.

Strength	Weaknesses	Opportunities	Threats
Availability and abundance of a broad range forest resources and NWFPs	Harsh economic environment and reduced capacity utilisation. Serious delay in the development of a national forest policy to provide overall development strategy in line with global trends.	Harnessing of public private partnerships and adoption of REDD+, green economy and other climate change initiatives	Resource plundering without accountability emanating from corruption in a depressed economic environment.
Total ownership of the resources	Reduced or non-availability of exploitation capacity by the owners and their immediate local contractors.	Opportunities for PPPs with well-resourced local or external organisations who can apply	Forest fires that can destroy the forest resources

Strength	Weaknesses	Opportunities	Threats
		sustainability and environmentally friendly resource exploitation approaches.	
Strong history of world class forestry best practices	Loss of memory through brain drain as forestry practitioners familiar with ISO 9000/ISO1400 and FSC principles leave the country or embark on other activities	Re-engagement with top class foresters, partner with better remunerating partners, and re-create the forestry business using the available forest resources	Loss of information on forest resources management and investor confidence.
Skilled manpower for primary and secondary forest production	Little knowledge on PPP structures and mechanisms. Negotiations done from a weak position out of desperation	Potential benefits from timber exporting and commercialisation of NWFP as there is an increased demand in natural products.	Loss of this manpower if the economic environment does not improve soon
High competitiveness of local forest products	Reduced export and increasing requests for exporting raw forest products. Imports of cheap timber products.	Improved modern processing and efficient plants and local processing of forest products	Regional and global competition. Cheap imports of forest products.

3.2.5 Linkages

To appreciate linkages within the forest sector, downstream activities from the primary industry were analysed whilst, at the same time, value chains assessed. The associations and contracts as well as informal relationships were analysed by means of a checklist to assess relationships through value chains up to national and regional levels.

3.2.6 PPP models

An opportunity for developing functional PPP models, e.g., through concessions, CBEs and CBOs was investigated by means of policy, legislation, and SWOT analyses at national and regional scales.

3.2.7 Trends

To make projections on the future 10 years, past 5-year trends were analysed and growth modelling for future consumption scenarios for the major five timber products and three non-timber forest products predicted. For the timber species growth and yield models developed on the Computerised Plantation Analysis System (Kassie,

1980) was used. The models give an idea of how commercial timber species perform on a normal range of sites with standard silvicultural treatments (see appendix B).

Volume growth measures were calculated using growth simulation models together with timber data of area planted by species and age from Timber Producers Federation reports. The following timber growth simulation models were used to calculate change in timber volumes (growth):

$$\boldsymbol{V_{pinus\ patula} = 453.171(1 - e^{-0.157A})^{4.166}}$$

$$\boldsymbol{V_{pinus\ elliotti} = 503.740(1 - e^{-0.103A})^{2.877}}$$

$$\boldsymbol{V_{eucalyptus} = \frac{510(1 - e^{-0.2A})^{4.170}}{1.47}}$$

Where **V** is volume of species and **A** is age of species

These growth simulation models were found to be appropriate for the use in the Zimbabwean situation because South Africa, where they were adopted, and Zimbabwe share the same climatic conditions and are in the same region.

For indigenous hardwoods, the standing timber volume was estimated using the formula given below; with this volume comprising the merchantable stem volume to a tip diameter of 15 cm and is estimated using the BANKS and BURROWS functions, which have the general form:

$\mathbf{V}_{timber}$ (m^3 o.b.) = a + b * Tree Basal Area (m^2) (see Annex A)

3.2.8 Contribution to the economy

Finally, an evaluation of the contribution of forest products to local and national economies was done through discussion of the findings of this study and existing literature.

4. RESULTS OF THE STUDY

4.1 Contextual background to the Zimbabwe forestry industry

4.1.1 Characteristics of land use and land cover

Zimbabwe land area is 39 million hectares, out of these 53% are under woodland and forest cover, 13% constitute bushland whilst 0.4% comprises forest plantations (Forestry Commission, 2008; Matose, 2008; Shumba, 2001). Generally, the vegetation is typical of savannah woodland separated by open grasslands and wetlands (Shumba, 2001). Within the woodlands and forests category, 26% are protected areas: national parks, state forests, wildlife safari areas and botanic reserves. Protected areas cover 15% of the country whilst communal lands cover 43%, predominantly distributed in the marginal areas of natural farming regions (NR) III and

IV (Figure 1). Thirty one percent of the land is within the former commercial farming and resettlement areas, located in NR I and II.

Distribution of forest plantations followed the allotment of commercial farming areas, with 95% of the forest plantations located in NR I in the Eastern Highlands of the country (Figure 1).

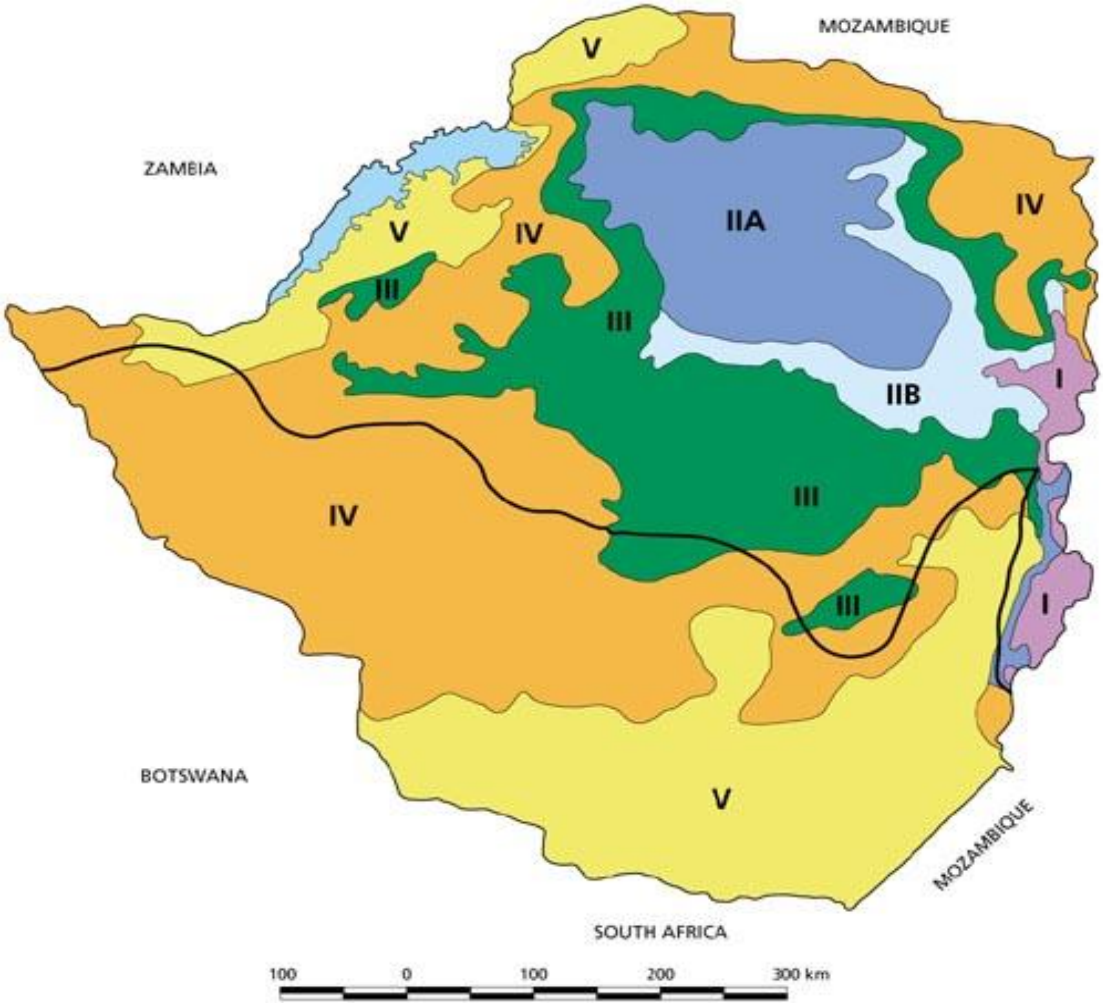

Figure 1: Natural Farming Regions of Zimbabwe (Source: FAO, 2006)

4.1.2 Land tenure systems in Zimbabwe

Land tenure had a bias towards the distribution of natural farming regions. The natural farming regions were established based on the rainfall regime, soil quality, and vegetation type, among other factors. They diminish in terms of land quality from NR I through to NR V (Moyo, 2000; Vincent and Thomas, 1961).

Before the FTLRP by the year 2000, Zimbabwe had four main systems of land tenure namely, private, state land, communal and resettlement. Except for the resettlement system, the other three were inherited from the colonial system. The private land tenure system was predominant in the commercial farming sector which occupied 31% of the country's total area, covering mostly NR I and II. The landowners had property rights and full control over the land and forest resources on it, with limited statutory prohibitions such as felling of indigenous trees and land use changes. As such most

forest plantations were owned by private farmers and companies in the Eastern Highlands of Zimbabwe (NR I).

The communal land tenure system, regulated by the Communal Lands Act (Chapter 20:04) of 1982, oversaw 42% (16.38 million ha) of the country's total area with 66% of the country's population. According to the Communal Lands Act (Chapter 20:04) of 1982, land is vested in the state President who has powers to permit occupation and utilisation in accordance with the Act (Shumba, 2001).

Resettlements which were created to alleviate population pressure from communal areas covered 10%. They did not have titles as they were leased lands. Fifteen percent of the country was left as state land whereby 2% (800 000 Ha) were protected forest and 13% (5.4 million ha) as national parks (Shumba, 2001). Forests and woodlands in protected areas are managed as gazetted land under Forestry Commission management whilst those in national parks are managed by the PWLMA.

4.1.3 Historical forest and woodland management interventions

The government, through the Forestry Commission, after having foreseen deforestation potential in communal areas, spearheaded the first Rural Afforestation Programme (RAP) 1 from 1983-89 to provide fuelwood to 65% of the country's population. Fast growing *Eucalyptus* species were established amounting to 4.2 million trees. The second phase of afforestation, RAP 2, ran from 1990-98 targeting agroforestry and indigenous woodlot management for food security and poverty alleviation. Sixty-four thousand (64 000) hectares were set aside for *in situ* management of 803 sites, and in addition, the establishment of 1 470 agroforestry sites. To improve the quality and quantity of forest resources, awareness campaigns, training workshops, field days, and extension services were provided. The Agricultural Services Support Programme (ASSP) was introduced in 1999 after RAP 2. A total of 501 woodland sites were identified and managed, and 1 134 agroforestry sites established (Shumba, 2001). The Rural Afforestation Programmes 1 and 2 and ASSP did not achieve the desired objectives due to livestock and fire damage as well as lack of water.

Gazetted forests were principally demarcated for the conservation of the fragile Kalahari sands in the Matabeleland North and Midlands provinces whilst forest plantations are managed in the Eastern Highlands of Zimbabwe. The Kalahari sands provide indigenous hardwoods such as *Baikaea plurijuga*, *Pterocarpus angolensis*, *Guibortia coleosperma* and *Afzelia quanzensis.* Exploitation of the hardwoods is done through concessions managed either by the Forestry Commission or RDCs. Exotic softwoods and hardwoods are grown in NR I. These are the two regions where commercial timber exploitation occurs (Figure 2). From the CFLWs, extraction of non-timber and non-wood forest products (NTFP/NWFPs), fuelwood as well as construction poles takes places.

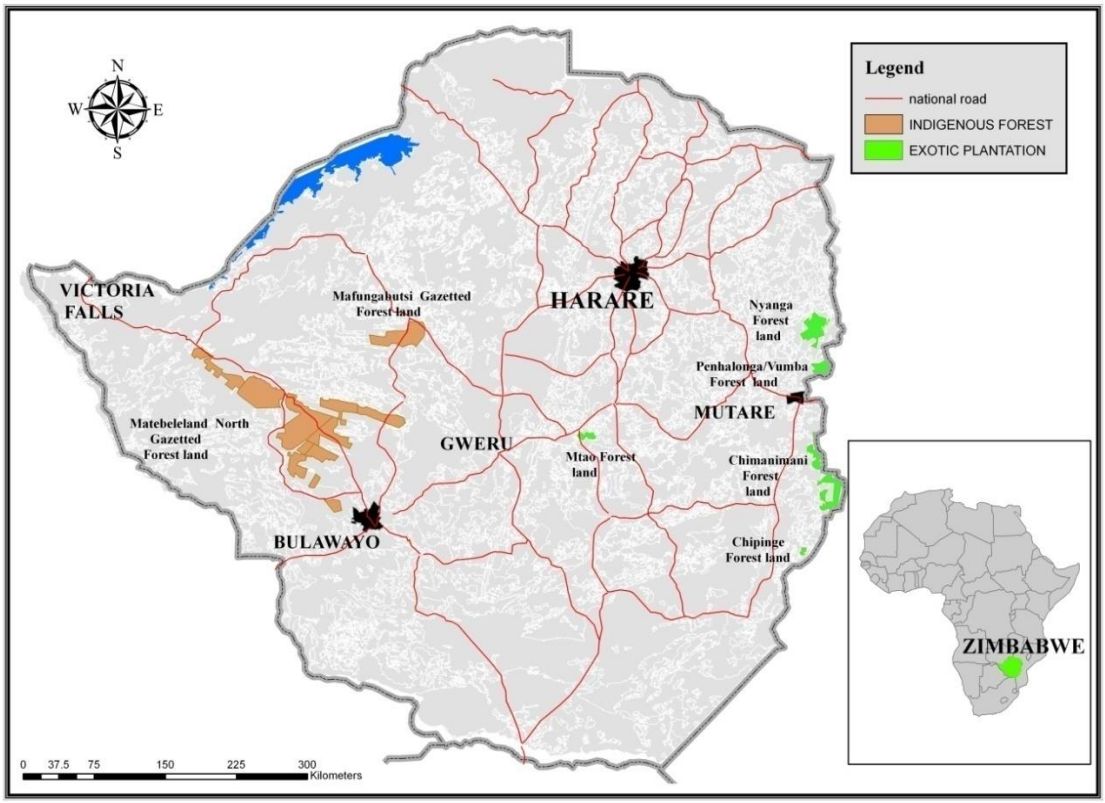

Figure 2: Location of significant forest plantations and gazetted forest land

4.1.4 Typology of sectors and key actors of the forest sector

Related to the land tenure system, the forest sector is categorised into 4 types: (i) commercial forest plantations (CFP), (ii) commercial farm forests (CFF) (iii) gazetted and protected forests (GF) and (iv) communal land forests and woodlands (CLFW).

The actors for these forest categories are diverse in their primary objectives. Within the CFP sector, actor interests are in sustainable forestry management and timber business. The sector raises exotic hardwoods and softwoods. The commercial agriculture farming sector grows hardwoods for construction, environmental services, tobacco curing and other farm requirements. Surplus timber is sold to the commercial forestry sector. In GFs, trees are managed for the conservation of the fragile Kalahari sands and concurrently the indigenous hardwoods are exploited for their high value timber. Communal lands forests and woodlands, with negligible management are exploited for NTFPs, fuelwood and construction material. The actors are normally NGOs, government departments and women, with emphasis on livelihood improvement through sustainable NTFP exploitation.

4.2 Forest production sector organisation and gender representation

The commercial primary and secondary production sectors' statistics are shown in Table 1. The statistics indicate that 65.4% of the employees are contractors. The sector used to have 100% permanent employees but of late, contractors dominate the workforce. The harsh socio-economic operating environment caused large forest

companies to contract out operations to cut down on operating costs, and to cover production shortfalls, especially in sawmilling, since they lack adequate capacity. Contracting out operations is also used by the companies as a black empowerment tool.

Table 1: Commercial forest employment statistics as of December 2014

Category	Permanent	Contract	Total
Plantations	1 554	3 021	4575
Sawmills	1 024	567	1 591
Treatments Plants	107	32	139
Wattle Extract	54	0	54
Factory	43	0	43
Admin/ Sales	139	11	150
Total	2 921	3631	6552
Ratio	44.6%	65.4%	100

(Source: TPF Annual Report, 2014)

In terms of gender representation, women constitute a bigger percentage in the sector (Table 2). However, they occupy lower ranks as general hands because a significant proportion of them lack the requisite skills and education to be in senior positions. Women rarely occupy decision making positions in companies and decision-making bodies, in both the private and public sectors; and it is therefore clear that while their numbers may look good, there is need for more women in positions of influence. This can be achieved through policy interventions like introducing a gender affirmative quota system where some senior positions are reserved for women (proportional representation) or by giving first preference of employment to women ahead of men in these positions.

Table 2: Gender representation in primary production

Type of primary production sector	Percentage of women	Total number of employees	Description
Commercial Forest Plantation (CFP)	65	6 552	Women are involved in tree nurseries, seedling planting and tending of saplings after establishment
Commercial Farm Forests (CFF)	52.7	239 368	
Gazetted Forests (GF)	10.3	3 324	Women are involved in management as forest guards and are also mobilized for fire protection
Communal Land Forests and Woodlands (CLFW)	52.9	3 994 274 (rather informal employment as groups)	Women are involved in woodlot management and fire protection, and prevention of livestock damage to woodlots
Average % representation	46.83		

Source: Zimstats Labour Force Survey, 2011

4.2.1 Primary forest production

Primary forest production is characterised by various actors which comprise private and state-owned companies, local authorities, and RDCs (Table 3).

Table 3: Key actors in the forest sector

Category of forests	Area (mil. ha)	Main species	Main products
Community (forests and woodlands in communal and resettlement areas)	10	Indigenous (diverse) and Eucalypts (*E. grandis, E. terreticornis and E. camaldulensis*)	Fuelwood, NTFPs (honey), Construction material
Local authority (Chipinge and Chimanimani RDC)	0.000828	Eucalypts (*E. grandis and E. saligna*)	Poles, Pulpwood, Fuelwood
Central government (woodlands on state land, protected areas and national parks)	6 plus 5.4	Indigenous: (*B. plurijuga, P. angolensis, G. coleosperma, A.quanzensis*	Sawn timber Fuelwood
Private companies	0.89 119	Pines (*Pinus taeda, P. patula, P. elliotii, P. maximinoi, P. tecunumanii*), *Eucalypts (E. grandis, E. saligna, E. cloeziana*) and Wattle (*A. meansii*)	Poles, Sawn timber, Charcoal, Tannin, Particle board, Pulp and paper
Public plantation (state-owned plantations; Allied Timbers)	0.112 585	Pines (*Pinus taeda, P. patula, P. elliotii, P. maximinoi, P. tecunumanii*,); Eucalypts (*E. grandis, E. saligna, E. cloeziana*) and *A. mearnsii*.	Sawn timber, Poles, Pulpwood, Fuelwood
Smallholder farms	0.03 577	Eucalypts (*E. grandis, E. saligna, E. cloeziana*)	Poles, Fuelwood, Pulpwood
Forestry Commission and Rural District Councils	0.800 000	*B. plurijuga, P. angolensis, G. coleosperma, A.quanzensis*	Rough sawn timber

Source: Forestry Commission and TPF databases

Primary forest actors within CLFW exploit resources for fuelwood, basic construction materials, NWFP/NTFPs such as mopane worms (*Imbrasia belina*), *Ziziphus mauritiana* fruit, baobab (*Adansonia digitata*) fruit and bark, marula fruit (*Sclerocarya birrea*), devil's claw (*Harpagophytum procumbens*), *Uapaca kirkiana* fruit and several miombo woodland mushrooms, medicinal plants and other fruit types. Basically, the *Miombo* woodlands are not managed but regenerate naturally, in contrast to re-establishment done for exotic trees in plantations. The actors include NGOs such as Phytotrade Africa, SAFIRE, Towards Sustainable Use of Resources Organisation (TSURO Trust), Fambidzanayi Permaculture, Practical Action, Specialty Foods of

Africa, Hivos, Cesvi, TDH, SNV, Environment Africa, BKAZ and Kaite. Most NGOs partner with communities in the management of woodlands and forests in communal areas and the gender representation of community groups can reach about 100 % women. However, the NGOs themselves have variable gender representation in their management as shown in Table 4.

Table 4: Gender Representation in Selected NGOs

NGO	Males	Females	Total	Percentage of women
Phytotrade Africa	7	3	10	30
SAFIRE	5	1	6	16.6
Environment Africa	3	2	5	40
SNV	11	6	17	35.3
TDH	2	5	7	71.4
Fambidzanayi Permaculture	7	0	7	0
Average %				38.7

Source: Organisation Websites

In gazetted forests, actors include concessionaires, the Forestry Commission and RDCs such as Gokwe, Lupane, Bubi and Umguza RDCs. The actors exploit indigenous hardwoods for commercial timber purposes. However, currently there are only 7 concessionaires working with RDCs under the supervision of the Forestry Commission, whilst the Forestry Commission has only one concessionaire in Mafungautsi. The representation of women is about 7% with a total of one male forest conservation manager, 15 male permanent forest protection guards, 9 male casual forest protection guards, and 2 casual female assistants. Within the protected areas, such as national parks and botanical gardens and game reserves, the PWLMA is the sole primary production actor as mandated by the Parks and Wildlife Act. The parastatal manages the areas for conservation, hunting and safari purposes, and without forest or timber resources exploitation. The representation of women stands at 20.2% as shown in Table 5.

Table 5: Representation of women in the Parks and Wildlife Management Authority

Category	Males	Females	Total	Percentage of females
Directorate	2	2	4	50
Management	37	22	59	37.2
Support Staff	26	12	38	31.6
Rangers	1107	260	1367	19
Total	1172	296	1468	20.2

Source: Parks and Wildlife Management Authority Database

Within commercial farmlands, there are several actors in the form of associations and tobacco buyers such as Premier, Curverid, Tribac, Zimbabwe Leaf Tobacco (ZLT), Zimbabwe Farmers Development Company, Tian Ze, Shasha Tobacco, Premium Boost Zimbabwe, Manrova Estates, Intercontinental Leaf Tobacco, Alliance 1, Gold Driven Investments, Chidziva Tobacco Processors, Tobacco Industry Marketing Board (TIMB), Sustainable Afforestation Association (SAA) and Northern Tobacco. The tobacco growers are prohibited by the Forestry Commission and the Environmental Management Agency (EMA) from using indigenous fuelwood to cure tobacco. It is mandatory, according to Statutory Instrument 116, for all tobacco

growers to raise their own fuelwood for curing tobacco, especially from fast growing hardwoods. The representation of women is 1 951 344 from the total of 3 573 893 agriculture and forestry employees, i.e., 54.6% distributed as shown in Table 6.

Table 6: Distribution of women within the agriculture and forestry sectors

Category	Number of females	Percentage within sector
Management/professional	11 708	0.6
Technicians/associate professionals	80 005	4.1
Clerical and secretarial	216 599	11.1
Service and sales workers	115 129	5.9
Skilled workers	220 502	11.3
Crafts related trades	44 881	2.3
Plant/machine operators	7 805	0.4
Elementary and general occupation	1 254 715.	64.3
Total	**1 951 344**	**100**

Source: Zimstat Labour Force Survey, 2011

4.2.2 Secondary forest production

Secondary forest production is characterised by extensive round wood processing and tertiary production/processing mainly for construction and furniture. The industry is characterised by vertical integration whereby companies own sawmills, manufacturing and processing industries. The country has eleven large sawmills owned by three companies (Allied Timbers, Wattle Company and Border Timbers) and numerous small (mobile) sawmills. Mobile sawmillers are subcontracted by the companies and may sell the timber either to the companies or secondary producers or retailers. There is one fibre and particle board company owned by Manica Boards and Doors and a veneer and plywood company owned by Border Timbers. However, the two are currently closed due to financial constraints. The Wattle Company operates 34 charcoal kilns and a wattle bark tannin processing factory at Silverstreams.

Gender representation in the secondary production sector favours males, especially within the timber processing sector. Women are only involved in light tasks, such as handling of timber in sawmills and factories, due to lack of training in requisite skills and low education levels as shown on Table 7.

Table 7: Gender representation in secondary forest production

Type of secondary production sector	Total number of employees	Percentage of women	Description
Sawmills (sawnwood)	1 591	38	Women are involved in the handling process and lighter jobs within the plants as well as monitoring the drying process.
Fibre and particle board	240	8	

Type of secondary production sector	Total number of employees	Percentage of women	Description
Veneer and plywood factory	0	0	Currently closed following economic challenges
Pulp and paper	0	0	Currently closed following economic challenges
Charcoal (kilns)	25	0	No women employed at the kilns
Industrial firewood (Tobacco farmers)	-	1	Few women involved in the process
Domestic firewood*	-	96	Women involved in domestic fuelwood collection especially in communal areas and leftovers from plantations
Construction poles	139	1	Menial job
Transmission poles		0	Menial job
Wattle bark for Tannin	43	6	Women only involved in handling of bark
Honey*	-	32	Women involved in processing only
Mopane worms*	-	76	Mostly women are involved in collection and processing of the worms
Mean Percentage		23.45	

Source: TPF and BKAZ Databases. *Estimates used since there is no available database

4.3 Gender representation in SMEs

Small Scale Enterprises, e.g., mobile sawmillers, within the forestry sector perform various operations as contractors. Contractors carry out silviculture, logging, and sawmilling operations in the primary production sector. In addition, secondary processors such as carpenters and timber merchants fall within Forestry Small to Medium Enterprises (SMEs). About 102 forestry related SMEs are found within the forestry sector, and with a total of 3 631 employees.

Among the silviculture, logging and sawmilling SMEs, women representation is 83%, 0% and 34% respectively. Secondary processors in the furniture industry are also male dominated, with 100% unless a company is registered in the name of both husband and wife. Very few SMEs are registered, 89% of them operate informally

even though some are so organised at group level like the Glen View furniture manufacturers. Most women operate only as general hands (22%) and administrators (16%). Furthermore, Community Based Organisations (CBOs) within CLFWs are considered as SMEs, especially formal groups working with NGOs. The CBOs organised by development agents like SAFIRE and Practical Action, among others, are run by committees made up of community members. The intention for such committees is to have gender representation of more than 70% women. The women normally attend meetings and help with collection and processing of NTFPs.

4.4 Technical and commercial organisation of forestry production

4.4.1 Technical and commercial organisation in primary forest production

Zimbabwe's forest industry raises and manages exotic hardwoods: eucalypts and wattle, as well as softwoods, mainly pines. Among the eucalypts, *Eucalyptus cleoeziana* is mainly grown for pole production under short and mid-rotation intensive cycles. The fencing pole regime runs for 4 years, whilst the telephone and transmission pole cycles are 6 and 11 years respectively. *Eucalyptus grandis* and *E. saligna* are grown for pulpwood that is used in fibre and particle board production on cycles ranging from 4 to 25 years. Alternative uses of the eucalypts are as mining timber and for sawlog production. The waste from eucalyptus species is used for charcoal production. Other species grown for fuelwood purposes in the much drier areas include *Eucalyptus terreticornis*, *E.camaldulensis*, *E. citriodora* and *E. paniculata*. Wattle (*Acacia mearnsii*) is grown for tannin (extracted from the bark) whilst the logs are converted into charcoal. Poplars (*Populus deitoides)* used to be grown to for the matches industry which has since closed down. Pine tree species, which include *P. patula*, *P. taeda*, *P. elliotti*, *P. tecunumanii*, *P. kesiya, P. oocarpa and P. maximinoi*, are raised for pulpwood and rough sawn timber, veneer, pulp and paper. Indigenous forests in the country have limited timber production potential, hence the low economic value. Although it is the case, they have a wide array of NTFPs which rural communities heavily depend on for food, shelter, fodder, medicines, and income. The forests also provide many environmental services which assist in coping with some environmental challenges, e.g., they act as carbon sinks which help to ameliorate climate.

4.4.2 Distribution, productivity, and utilisation of managed tree species

Exotic plantations in Zimbabwe cover 201 704 ha, with a potentially plantable area of 96 002 ha. Conservation area covers 1 057 702 ha. Approximately 95% of forest plantations are in the Manicaland province (Table 8).

Table 8: Distribution of forest plantations by province and ownership as of December 2014

	Manicaland	Midlands	Total	%
Private	89 119ha	0	89 119ha	44
State	104 415ha	8 170ha	112 585ha	56
Total	193 534ha	8 170ha	201 704ha	100

Source: TPF Annual Report 2013

The commercial plantations area is indicated by species as shown in Table 9.

Table 9: Distribution of commercial plantation area by species as of December 2014

Area (ha)	Pine	Eucalypt	Wattle	Poplar	Total
Total area, as of 2014	58 477	14 088	11 450	30	84 045
Adjustments	1 680	60	5	0	1 745
Fire losses	-599	-15	-383	0	-997
Clear felled	-2 452	-376	-443	0	-3 271
Re-coppiced	0	319	0	0	319
Re-planted	2 667	371	97	0	3 135
Extension planting	0	50			50
Total area	59 773	14 497	10 726	30	85 026
Gain/loss for the year 2014	+1 256	+409	-724	0	941
Area temporarily not planted	8 205	953	1 818		10 976
Available for afforestation					25 768

Source: TPF Annual Report 2014

Table 10 shows area-age distribution and productivity of the tree species grown and raised for commercial purposes in the plantations.

Table 10: Area - age distribution and productivity of the raised species

Species		Age (Years)						Total
		1-5	6-10	11-15	16-20	21-25	26+	
Pine	Area (Ha)	14 105	12 063	5 229	8 993	8 037	11 347	59 773
	Productivity (MAI)	16 m³/ha/annum						
Eucalyptus (principally poles)	Area (Ha)	3 579	1 407	2 549	1 796	1 111	4 055	14 497
	Productivity (MAI)	15 m³/ha/annum						
Wattle	Area (Ha)	5 997	4 636	66	0	0	27	10 726
	Productivity (MAI)	15 m³/ha/annum						
Poplar	Area (Ha)	0	0	0	0	30	0	30
	Productivity (MAI)	N/A						
Total area		23 681	18 106	7 844	10 789	9 178	15 429	85 026

Source: TPF Annual Report 2014

4.4.3 Roundwood utilisation

Softwoods dominate the production of roundwood in the sector. Table 11 shows roundwood utilisation for the commercial forest plantation sector for the 3 major genera within the industry.

Table 11: Roundwood Utilisation of Exotic Commercial Timber Species

Plant/Source	Pine m^3	Eucalypt m^3	Wattle m^3	Total m^3
Sawmills	384 540	9 380	0	393 920
Pole production and impregnation	0	40 073	0	40 073
Charcoal	0	0	28 166	28 166
Fuel wood	0	3 560	6 860	10 420
Total	384 540	53 013	35 026	472 579

Source: TPF Annual Report 2014

4.4.4 Technical and commercial organisation in secondary forest production

Table 12 shows pine and eucalyptus sawmilling statistics. There is pine sawmilling dominance with 97.7% compared to eucalypts with only 2.3%. Milling of eucalypts is affected by splitting of the timber hence the need for skilled handling capacity. Contractors (mobile saw millers) are increasingly making significant production (18.8% of the pine sawn wood) since the established sawmilling companies are affected by erratic availability of power and therefore reduced capacity utilisation. The contractors became more relevant during the peak of the economic crisis unlike before, when forestry companies did all milling operations by themselves.

Table 12: Sawmilling and processing statistics

	Company sawmills		**Contract sawmills**		**Total**	
	Pine (m^3)	Eucalyptus (m^3)	Pine (m^3)	Eucalyptus (m^3)	Pine (m^3)	Eucalyptus (m^3)
Input	326 839	9 112	65 775	0	392 614	9 112
Output	140 013	4 664	32 505	0	172 518	4 664
Recovery	43%	52%	49%	0%	44%	52%

Source: TPF Annual Report, 2014

The operating capacities of the companies have significantly dropped and some of the plants have closed, e.g., veneer and plywood factory, the pulp and paper and the match production. Table 13 shows secondary forest production installed and operating capacities.

Table 13: Secondary forest production installed and operating capacities

Type	No. of plants	Total installed capacity	Average operating capacity (% of installed capacity)	Total inputs	Total outputs	No. of employees
Sawmills (Sawn wood)	11	763 200 m^3	27 996 m^3 (3.7 %)	335 957 m^3	144 677 m^3	1 591

Type	No. of plants	Total installed capacity	Average operating capacity (% of installed capacity)	Total inputs	Total outputs	No. of employees
Fibre and particle board	1	110 000 m^3	50 400 m^3 (45.8 %)	50 400 m^3	30 240 m^3	240
Veneer and plywood factory	1	35 000 m^3	0 (0 %)	0	0	0
Matches	1	-	0	0	0	0
Pulp and paper	1	18 000 tonnes	0 (0 %)	0	0	0
Charcoal (Kilns)	34	22 032 tonnes (100 %)	28 166 tonnes	28 166 tonnes	22 032 tonnes	25
Industrial firewood (Tobacco farmers)	-	-	10 420 m^3	-	10 420 m^3	-
Domestic firewood	-	-	-	-	-	-
Construction poles	4	130 176 m^3	4 007.3 m^3	4 007.3 m^3	4 007.3 m^3	139
Transmission poles	4		36 065.7 m^3	36 065.7 m^3	36 065.7 m^3	
Wattle bark for tannin	1	6500 tonnes	1 815 tonnes (27 %)	5 445 tonnes	1 815 tonnes	43
Honey	-	500 000 tonnes (honey) 50 000 tonnes (beeswax)	(18.7 %) (0.18 %)	9 397 5tonnes (honey) 90 tonnes (beeswax)	-	-
Mopane worms	-	-	-	-	-	-

Source: Company and NGO Information

4.5 Strategies for sustainable supply for private forest production

4.5.1 Re-establishment and re-planting

Zimbabwe's plantation forestry exploits clear-felling at the end of each rotation and all harvested compartments are required to be under tree cover soon after harvesting. This was the standard practice, but since 2000 economic challenges resulted in the reduction in planted areas. However, natural regeneration in some cases has been

allowed. The Forestry Commission supervises private companies to ensure all harvested compartments are re-planted.

4.5.2 Development of out-grower schemes

Companies which do not own land and forests enter out-grower partnerships with farmers and private producers to ensure the sustainability of their operations. They also get some of their timber requirements from established companies. To date, individual farmers and existing out-growers have 6 649ha to supply the particle and fibre board plants. This partnership consolidates primary forestry production activities in smallholder properties and the companies which is vital within the supply chain.

4.5.3 Research and development

The Forestry Commission has been the sole research organisation for the commercial timber industry in a bid to enhance wood quality, productivity and sustainability. Research has been carried out to ensure proper introduction of exotics, species and provenance trials, site species matching, tree breeding, plantation silviculture, forest protection, mapping and inventory, seed research, entomology, and pathology. Since 1954, big investments have been made in research, and field trials for plantation research have been undertaken at John Meikle Forest Research Station (JMFRS), Muguzo and the Forestry Research Centre. JMFRS focuses on pine and eucalyptus tree improvement, while Muguzo focuses on pine silviculture research. Ngungunyana Research Station caters for silviculture and breeding of eucalypts, whilst Chesa Forest Research Station was established to cater for dry zone and agroforestry studies. The species grown in plantations are a product of research carried out locally and to a certain extent in South Africa. The species grown have performed better than in their origins. The Seed Centre has developed expertise to the extent of exporting seed to the region and abroad. Achievements from the research stations to enhance sustainability include development of high-quality genetic resources (species progenies provenances) as well as productive seed orchards. The other achievements include the reduction of rotation age for pine sawn timber species from 30 to 25 years. Silviculture research has resulted in the development of complete volume tables for major plantation species for all ecological zones. Management regimes for major plantation species have been confirmed (Yapi, 2001). Research on pests and diseases has been a success e.g., studies on baboon ecology and behaviour within pine plantations.

4.5.4 Regulation by the Forestry Commission

The Forestry Commission regulates and enhances capacity in the utilisation and management of forest resources. One of its functions is to collect data on plantation areas, afforested areas, sawlogs and sawn timber output. It is mandated by the Forest Act (1954) (Chapter 19.05 as amended in 1999) and the Communal Lands Forest Produce Act (CLFPA) (Chapter 20 of 1987), to regulate the forestry sector in terms of forestry extension, management of gazetted forests, forestry research and training. It also carries the responsibility of promoting the sustainable management and development of the nation’s forests. Its restrictive policies are meant to regulate unsustainable timber harvesting. This also aligns with the individual companies which put in place strong strategic plans for their sustainability (they assign annual allowable cuts that ensure sustainability).

4.5.5 The Timber Producer's Federation (TPF)

The TPF, created in 1995, is an association of plantation growers and sawmillers. It promotes timber products, research, training, and the protection of quality and environmental standards. It is the main and the only authentic source of data and information on production from industrial plantations as well as wood products for the domestic and export markets. Timber companies which are the members are expected to provide accurate and up-to-date information from forests and processing plants. Every year, the TPF produces the basic facts and figures on plantation forestry production (Kojwang, 2011). One of its major functions is on policy advocacy with government, particularly on land reform and tenure security. It also seeks new export markets for its members, promotes applied research in aid of improved production, for example baboon control. It also advocates for price stability in the timber market by discouraging purchase of illegally sourced timber that in recent years had brought price distortions on the local market. In terms of achievements, the TPF was able to convince the Forest Stewardship Council (FSC) to give it a 3-year exemption to use brodifacoum (*papiol*) experimentally for baboon control in pine plantations without the companies losing their FSC certificates, despite the FSC prohibiting use of poisons in pest control.

4.5.6 Certification

Towards the end of the 1990's timber companies explored external competitive markets. They embarked on a certification process of their operations and activities, as well as their timber, based on sustainability. Locally, the TPF developed a tool for the assessment of sustainable plantation and environmental management on estates which was on a five-star rating. The best estates are rated 5 stars. Internationally, the FSC certification was adopted as well as the SGS ISO 9001 standard for quality assurance. These helped the industry to penetrate regional markets, especially South Africa, where the Wattle Company and Border Timbers sold their rough sawn timber and some finished products. In 2012, the Timber Industry and the Standards Association of Zimbabwe (SAZ) developed the Sustainable Plantation Forest Management Standard (ZSW 923 of 2012) whose purpose is to provide assurance regarding quality and minimum environmental impacts of plantation forest management.

4.5.7 Agroforestry

Agroforestry ensures more timber resources are available to augment resources from the commercial forest plantation. Due to increased competition for fuelwood for the tobacco industry and wood resources for the timber industry as well as the need for the expansion of the forest resource, several tobacco farmers have entered alliances with tobacco associations and buyers to grow eucalypts within the tobacco growing areas. It has also become a punishable offence for anyone to cure tobacco using fuel from indigenous trees.

4.5.8 Forest resource regulation instruments

Zimbabwe has several existing legal and policy instruments that deal with ownership, control, access, and use of forest resources. The Forest Act 1954 (Chapter 19:05) and the CLFPA 1988 (Chapter 19:04) regulate forest management. The Forest Based Land Reform Policy of 2004 ensures that forest development plans are integrated with

overall land-use plans and supports the development of environmentally sustainable small-scale industries (Chibememe *et al.,* 2014). The government or its agencies also have a direct and indirect impact on forest resources management, including the Ministries of Mines and Mining Development; Ministry of Environment, Water and Climate, as well as EMA, PWLMA and the Forestry Commission.

4.5.9 Fire protection

The impact of fire has been very significant in the management of forests. To date, the country has lost large tracts of land to forest fires. Veld fire incidences have been on the increase from a record of 950 905 ha burnt in 2009 to over 1 653 822 ha burnt in 2014 (EMA, 2014), and this compromises sustainable supply of timber resources. On average, 2.5% of the total country area is subjected to fires, while 1.19% of the plantation area is burnt. The forest companies may fail to replant all burnt areas and as such their rotations get affected. The EMA, Forestry Commission and forestry companies share the responsibility of safeguarding the forest resources. To manage veld fire occurrences, the government launched a National Fire Protection Strategy in 2006 that gives responsibilities to its departments and structures (Phiri *et al.*, 2011) ; while EMA has passed a series of regulations to prevent veld fires, for example, Statutory Instrument 7 of 2007, which governs veld fire management in the country compels users, owners and occupiers of given pieces of land to have pre-suppression measures to curb veld fires. EMA also works in collaboration with the Fire Brigade and traditional leadership. At forest estate level, Fire Management Plans (FMP) are in place, and they detail fire management strategies and operations for the estate, thereby enhancing sustainability.

4.5.10 Education and training

Community education on fires has brought positive perception on fire management with communities increasingly participating actively through fire prevention campaigns and fire prevention and suppression trainings. Extensive education and training help in minimising timber resource exploitation, increase productivity and yield. Training of loggers plays a major role in implementing sustainable forestry as it increases their knowledge and skills in line with technological advances (Germain and Harris, 2003).Training conducted periodically is for chainsaw operators, tractor drivers, Safety Health and Environment (SHE) practitioners and all staff, Quality Assurance (QA), fire-fighting, resource monitoring, extension, tree planting and tending, beekeeping, harvesting of NTFPs, climate change issues and low impact logging. With a knowledgeable and well-informed public on environmental issues the country could have effective environmental conservation and management. Education encourages change in behaviour that could create a more sustainable future, while practical training helps people make decisions and carry out work in a more efficient manner.

4.5.11 Matching the resource base with supply and demand

All forestry companies must monitor their resource base and relate it to market demand. If the market requires more supplies than the company's annual allowable cut, then there is an option of out-sourcing from out-growers.

4.5.12 Land tenure

Sustainable forest management activities succeed when there are clear land and resource tenure and access rights. The land reform programme of year 2000 brought significant changes to land use and tenure. It modified land management to numerous smallholder landowners from large scale commercial farms and large plantation forests. Individuals now own land on 99-year leases. The owners have exclusive property rights and full control and responsibility over the land. Though this type of tenure provides landowners with incentives to develop the resource base, smallholder landowners lack financial resources to run forestry business, and this has led them into running their farms in subsistence ways. A few the plantations were gazetted for resettlement but are not yet allocated to anyone so the status of this land is uncertain, companies cannot utilise it, hence little is invested in them. Security of tenure plays a direct role on how innovations and management options are implemented in the private forestry sector leading to sustainable utilisation of forestry resources (Romano and Reeb, n.d.). Without security of tenure, non-sustainability can be exacerbated by failures in monitoring and control systems by the users.

4.6 Socio-economic analyses of primary and secondary forest production

4.6.1 Marketing and trade opportunities in the forestry sector

Zimbabwe's forestry sector had constantly grown from the late 1980s up to the beginning of the millennium. During that period, it had managed to satisfy the local market and had extended its influence on the southern African region, especially South Africa, Botswana and Namibia. Rough sawn timber and timber products, e.g., poles, particle and fibreboard, doors and veneer went through a process of certification with the FSC, SGS Qualifor, ISO 9000 and ISO 14000. This made a few markets more accessible to the industry. The Forestry Commission was exporting certified seed to countries as far as South America, Australia and New Zealand. At the height of the FTLRP, the economy started to decline and coupled with that, timber exports also declined. Local sales became unfavourable due to inflation and continuous devaluation of the Zimbabwe dollar (Z$). Exports demanded that timber be certified to be competitive on the export market. Companies also lost value in their bank savings which continued to be devalued when companies could not access the money from banks. However, from 2009, the country resorted to go for a multi-currency system which saw the country using the United States Dollar, the South African Rand, the Botswana Pula and other major currencies. Timber companies thus borrowed from banks to resuscitate their operations. Unfortunately, this did not yield the expected results as the economic environment continued to deteriorate. Now, several markets have opened for various timber products. Poles are being exported to Malawi, Zambia, Tanzania, Kenya and Mozambique. Rough sawn timber is being exported to South Africa, Namibia and Botswana. However, none of the companies has renewed their sustainability certification because of the high costs involved as well as the current subsistence felling being done by companies. Artefacts also have a broad market in South Africa and the region whilst NTFPs of medicinal, fruit and food value are finding their way into the regional and international community from NGOs like Phytotrade Africa and SAFIRE, however in small quantities.

4.6.2 Policies and strategies for the development of the forest products industry

4.6.2.1. Development opportunities of the forest product industry

The Ministry of Environment, Water and Climate through its line departments (the Forestry Commission, EMA and PWLMA) is the principal player in forest biodiversity management. Other sectors such as agriculture, construction and water have both direct and indirect impacts on forest resources. These institutions establish conditions (facilitating and constraining) for and regulation of the magnitude to which forest produce may be utilised.

4.6.2.2. Policies and regulatory mechanisms

The Forest Act and the CLFPA are the prime pieces of legislation that govern the exploitation and protection of forest and woodland resources in Zimbabwe. Many other policies (Statutory instruments) are issued which facilitate and regulate the use of forest resources by various players.

Several government and non-governmental organisations for example TPF, SAFIRE, Phytotrade Africa, Speciality Foods of Africa and Environment Africa are involved in various aspects of forest management to varying degrees. The TPF promotes timber products, research, training, and the protection of quality and environmental standards in plantation forestry; SAFIRE facilitates the development of businesses that use natural resources especially from plants, on the justification of sustainable exploitation and conservation. Phytotrade Africa helps rural community-based enterprises create a robust and sustainable natural products industry while ensuring the conservation of indigenous biodiversity. It also promotes sustainable harvesting and production of natural products. Speciality Foods of Africa work to sustainably commercialise indigenous natural resources, providing income for rural producers while encouraging conservation of their resources, and is a member of Phytotrade Africa. Environment Africa offers programmes and interventions that cover areas of sustainable use of natural resource. The prominent government departments are the Forestry Commission, EMA, PWLMA, and RDCs. Given the complementary roles played by these institutions (government and non-governmental organisations) in the maintenance of forest biodiversity there is great need for cross sectoral linkages by the Forestry Commission and the EMA through the creation of Rural Community Enterprises.

The Forestry Commission is responsible for the conservation of forest biodiversity. Its operations are guided by the Forest Act which gives it the authority to protect forests and woodlands and to govern the exploitation of forest resources. The Commission interacts with other government departments and many NGOs in the performance of its duties. The Environmental Management Act of 2000 governs the functions of the EMA which covers all natural resources including forests, water, soil, air, and minerals. The agency's functions generally involve monitoring, regulation, and enforcement of rules on environmental conservation. However, the distinction between its regulatory functions and those of the Forestry Commission in forestry matters is unclear. The PWLMA oversees wildlife conservation. It oversees the management of the country's parks which contain a large part of the country's forest biodiversity. There is lack of a coordinated approach between PWLMA and the Forestry Commission on forest conservation matters. Rural District Councils formulate and enforce local by-laws for resource conservation whilst in agriculture the role of trees and woodlands is lowly recognised, resulting in poor positive linkages between agriculture and forestry.

4.6.2.3. National policies

.1. SI 77 of 1980, i.e., Forest (Undemarcated) regulations, 1980: establish settlement areas and gives the Chief Executive Officer of Forestry Commission powers to manage forests in settler areas

.2. SI 09 of 1989, i.e., Communal Land Forest Produce (Delegation of Minister's rights and Functions) Notice 1989: gives power to the minister to harvest forest produce from state forests. The minister can also delegate power to the Forestry Commission or RDC.

.3. SI 112 of 2001, i.e., Forest (Control of Timber) (export of Unprocessed and primarily processed Indigenous Hardwood) Regulations 2001: imposes a ban on export of unprocessed timber.

.4. SI 116 of 2012, i.e., Forest (Control of Firewood, Timber and Forest Produce) Regulations, 2012: ensures that the selling or trading in firewood or timber or its movement should be done by a person who has obtained a licence or permit to do so. It also requires tobacco farmers and processors to establish wood energy plantations.

.5. The Forest Based Land Reform Policy of 2004 seeks to engage Zimbabweans in forest management so that they benefit from the products and services from forests and to encourage them to engage in afforestation within their respective districts and provinces.

4.6.2.4 National laws

.1. Forest Act: The primary focus of the Forest Act rests on state forests and on forest resources occurring on all forest lands in the country, most of which comprise the large-scale commercial farming sector, though it tries to be broad in its coverage of forest resources throughout the country. The control of the Forest Act over private forests is less strict and provides a somewhat self-regulatory control mechanism for the management of private forest resources by their owners. The Forest Act *prima facie* prohibits the harvesting, injury or destruction of any indigenous trees or timber from private forests and forest produce from any State land except in terms of a valid timber permit issued with the consent of the appropriate authority for the land.

The Forest Act provides for the establishment of demarcated forest areas and establishes a commission to serve as the state authority mandated with the dual responsibility of providing policy advice to the minister responsible for the administration of the Act and of performing regulatory functions. The regulatory functions deal with the control, management and exploitation of state forests, plantations and forest nurseries belonging to the state and any other land as may be required by the state for forestry purposes.

In line with the provisions of the Forest Act, government gazetted 800,000 ha of indigenous forests in the fragile Kalahari sands of western Zimbabwe in the 1940s. However, biodiversity conservation in these forest areas is being threatened by neighbouring communal area inhabitants who illegally settle or obtain timber and non-timber forest products from them. The colonial protectionist approach to conserving these forests is now being replaced by considering communities living on the "forest

edge" as partners in the conservation, management, and utilisation of the forests through resource and benefit sharing arrangements.

.2. Communal Land Forest Produce Act (CLFPA): The CLFPA is applied in the communal areas and imposes a rather strict regulatory framework which is highly state interventionist. Conversely, a range of authorities are provided for, and these cover licenses, agreements and permits. Communal area inhabitants are only allowed to exploit forest produce for own use and the sale or supply of any forest produce to any other person is prohibited. In cases where a forest falls within the jurisdiction of a local authority, control over the resources therein lies with the appropriate RDC, which has the right to grant concessions to outsiders to utilise forest products for commercial purposes. However, the limitation of the right for inhabitants to exploit forest produce for "own use" prevents local level initiatives for the sharing or exchange of resources and fails to acknowledge the centrality of woodland resources within the rural economy (Katerere *et al.*, 1999). CLFPA is silent on all aspects of participation and incentives for community participation. Despite the exclusion of community participation in the piece of legislation, communities have, in practice, participated in shared forest management through the Forestry Commission's Social Forestry Programme.

.3. Environmental Management Act: The Environmental Management Act covers all natural resources including forests, water, soil, air and minerals; and its objectives are to provide for the sustainable management of natural resources and protection of the environment; the prevention of pollution and environmental degradation; the preparation of a National Environment Plan and other plans for the management and protection of the environment. It governs the EMA whose functions generally involve monitoring, regulation, and enforcement of rules on environmental conservation.

.4. Rural District Councils Act: The Rural District Councils Act gives councils power to take measures to conserve natural resources, permit grazing and cultivation, develop land use plans and make by-laws for the protection of natural resources. Councils may issue permits for catching fish, hunting, cutting firewood, cutting grass, and collecting honey. The Act, under Section (61), provides for the establishment of Environmental Committees and sub-committees that have an oversight on the conservation of natural resources in communal lands. The Department of Rural and Urban Planning formulates local by-laws for resource conservation with the involvement of RDCs, who are closer to the natural resources.

.5. Parks and Wildlife Act: The Parks and Wildlife Act provides for the establishment and management of gazetted protected areas and conservation and management of the wildlife resources and landscape therein. The Act confers privileges on owners or occupiers of alienated land as custodians of wildlife. It gives the Appropriate Authority over wildlife to RDCs for communal lands on behalf of local communities. Parks are no go areas for Forestry Commission, but the PWLMA gives quota to game in forestry areas.

4.6.2.5 Regional policies

Regional policies that have implications on facilitating and regulating forest resource management of which Zimbabwe is a signatory to include SADC Protocol on Forestry 2002, Common Market for Eastern and Southern Africa (COMESA) 1994 and African Convention on the Conservation of Nature and Natural Resources (African Union-AU).

4.6.2.6. Global policies

Zimbabwe is a signatory to many international conventions that facilitate and regulate forest resource management such as the UN Convention on Biodiversity, UN Convention to Combat Desertification (CCD), Convention on International Trade on Endangered Species of Wild Flora and Fauna (CITES) and initiatives of the United Nations Forum on Forests (UNFF) like the UN Forest Instrument on all types of forests. The conventions and initiatives advocate for the conservation of biodiversity together with the improvement of livelihoods.

In Zimbabwe, these obligations are implemented in the following ways:

Production of a National Biodiversity Strategy and Action Plan document.

Production of a National Communication Document on the climate change convention.

Development of a National Action Plan on the desertification convention.

4.6.3 Employment opportunities and wealth creation from processing and marketing of timber and NTFPs

The timber industry employs non-skilled, semi-skilled and skilled manpower. Technical and professional manpower would favour the industry for its good remuneration and benefits. In the 1990s there was an upsurge of employment figures but became stagnant from early 2000 then started to decline from 2005 (Fig 3) to date in response to the harsh socio-economic operating environment in the country. Many experienced professionals left for the diaspora (countries like Mozambique, Tanzania, Uganda, South Africa, Rwanda, the DRC, Ghana, Malawi, Australia and Tasmania) as the economic environment deteriorated. The timber industry started to experience a down fall and enrolments in forestry colleges and universities declined (Table 14 and Table 15) also since prospective students felt that they would not get employment. Companies retrenched and focussed on logging with reduced planting. In the exploitation of NTFPs, women do the bulk of harvesting and processing. Where the products are of high market value men are involved as they are also able to look for lucrative markets. Where development agents are involved, and work with women, they assist in search for lucrative markets thereby enhancing their income.

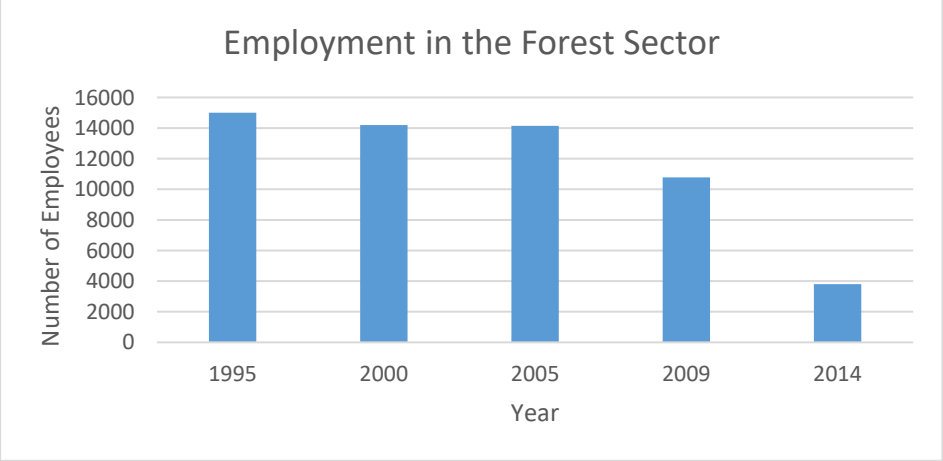

Figure 3: Employment in the forest sector. Source: TPF Statistics

Table 14: Enrolment of forestry students at Bindura University of Science Education

Year	Male	Female	Total
2012	6	1	7
2013	7	0	7
2014	4	0	4

Source: Survey statistics

Table 15: Enrolment of Students at Zimbabwe College of Forestry

Year	Certificate			Diploma		
	Male	Female	Total	Male	Female	Total
2011	4	1	5	12	8	20
2012	0	0	0	36	10	46
2013	0	0	0	0	0	0
2014	5	1	6	23	6	29
Percentage		16.7	100		20.7	100

Source: Survey Statistics

4.6.4 Factors influencing participation of marginalised groups

Marginalisation of local communities and groups in the forestry industry takes a historical perspective of land distribution and allocation dating back to the colonial times (Hill and Katerere, n.d.). Blacks were confined to unproductive land in the communal areas, while the remaining land was designated as white owned commercial lands or forest lands and national parks. Blacks subsisted through overexploitation of forest resources. When state forests were established in the late 1930s, blacks were further excluded from land and forest resources. This inequitable land and resource distribution remained unresolved and has led to the illegal occupation of large-scale commercial farms and plantations throughout the country by the landless (Bradley and Dewees, 1993). The government has also gazetted some of the farms for resettlement. However, forest plantations have least been affected resulting in continued conflict with illegal settlers. Illegal settlers have caused problems, such as forest fires and disruption of forestry activities. By December 2014, forest land with illegal settlers amounted to 7 919 ha (Table 16)

Table 16: Summary of area occupied by illegal settlers

Year	Area occupied (ha)	Individuals	Families
2010	-	-	-
2011	5 699	1 024	1 456
2012	5 515	-	559
2013	7 256	1 536	187
2014	7 919	1 535	195

Source: TPF Database

Some of the forest companies ceded part of their land to the government for resettlement e.g., the Wattle Company ceded Nyabamba estate (747.7 ha.) and Mutare Board and Paper Mills ceded 280ha.

The insecurity of tenure amongst the marginalised groups, such as farm workers, youth, and women, worsened. No commitment was made regarding a specific proportion of the land resettled for the youth, farm, and forest estate workers. Those displaced had access to land undermined and this affected their livelihoods.

Women's ownership of land is limited despite their important role in forestry activities. The percentage of female land beneficiaries under the FTLRP resettlement models A2 and A1 was 12% and 18% respectively, falling far short of the gender parity ideals. Women's lack of access and control over land leads to them being excluded from credit, marketing facilities, and decision-making powers over production activities and benefits, thereby negatively impacting on their productive capacity. Women's decision-making power in households is considerably limited (Kiptot and Franzel, 2012). These marginalised groups often lack appropriate technology, resulting in them resorting to manual labour.

4.6.5 Gender -based control and access to resources for development of the forest sector

Zimbabwean men and women experience difficult, and sometimes different, environmental and developmental challenges because of their different roles, relations and responsibilities, opportunities and constraints, and uneven access, ownership, and control of resources. Furthermore, forestry, agriculture, environmental and related policies and programmes often fail to recognize women's special needs and crucial contribution in the use and management of such resources. Women's ownership of assets that are often required for collateral is very low and gender inequalities in terms of women's ownership of land persist. Though funding schemes targeted at women have been established in small and medium businesses access to the products by women is below 30%. Table 17 shows private ownership of land in large scale farms from 1995 to 1999.

Table 17: Land ownership

Year		Males (%)	Females (%)
1995		68.6	31.4
1996		68	32
1997		66.9	33.1
1998		66.8	33.2
1999		66.8	33.2
2010 Post Land Reform Statistics			
2017	A1 model	69.3	30.7
	A2 model	84.2	15.8
	Small scale commercial farms	63.4	36.6
	Large scale commercial farms	80.4	19.4

Source: Central Statistical Office

The Ministry of Women's Affairs, Gender and Community Development has rolled out a Women's Fund to finance income generating projects for women and is in the process of initiating the establishment of a Women's Bank. In 2012, agriculture sector loans distribution showed that only 4% was received by women. The need for an own bank by women emanates from the marginalisation also indicated in Table 18 which shows the distribution of agriculture vehicles by gender in 2010.

Table 18: Beneficiaries of agriculture machinery and equipment

Type of Machinery/Equipment	Sex		Total	Percentage of female beneficiaries
	Male	Female		
Trucks, lorries and vans less than 1 tonne)	2374	279	2653	10.5
Trucks, lorries and vans more than 2 tonnes)	3478	491	3969	12.4
Passenger cars	2 190	325	2 515	12.9
Motorcycles, scooters etc	1 617	221	1 838	12
Self-propelled combine harvesters	235	18	253	7.1
Tractor drawn combine harvesters	187	11	198	5.6

Source: Central Statistical Office

Women trail behind men on measures of economic empowerment, such as labour force participation, wage equality and representation in senior positions (UNICEF, 2014). Women's access to forestry productive resources is relatively low. Those women who are highly educated have access to better market information such as marketing channels and prices and are therefore in a better position to make informed decisions on where to purchase and sell stocks without making any losses.

Zimbabwe has put in place gender sensitive policies and that will go a long way in enabling women to benefit fully from forestry. Nevertheless, women's participation is low in enterprises that are considered men's domain like timber trade and high in enterprises that are considered to have little or no commercial value such as collection and processing of NTFPs. In relation to marketing of forestry products, women are confined to the lower end of the value chain (retailing) which limits their control over and returns from the productive process. For women to come out of this trap, various policy, technological and institutional interventions are needed in terms of land tenure reforms, access to financial resources and marketing information, education and appropriate technology.

4.7 Linkages between actors in primary and secondary forest production

4.7.1 Linkages among actors in primary forest production

Among primary forest production actors within the commercial sector, linkages exist for service provision in terms of firefighting and protection. Forest companies form fire committees within operational regions. They plan preparedness for the fire season and monitor fire occurrences during the fire season. Monthly returns are sent to their

Head Offices for subsequent transfer to the TPF which then keeps all plantation fire records. Forest protection and firefighting are a cause for concern to all companies because when a fire breaks out on one plantation, neighbours are obliged to join in firefighting. Estate employees from other regions are also obliged to help with firefighting if one region fails to extinguish the fires. Of late, illegal settlers and disgruntled employees have been causing fires in plantations to attract attention from government and estate owners. Companies also carry out environmental management competitions through peer evaluation to ensure best practices. All records of common interest are coordinated centrally by the TPF, for example, pests, diseases, tree damage by baboons and control records.

Within commercial farming areas, RDCs and development associations, linkages at primary level include Intensive Conservation Area Associations (ICAA) which advocate for best practices. Commercial farmers and RDCs also supply pulpwood and sawlogs to established companies.

In state forests, the Forestry Commission may lease out any demarcated forest. Within the demarcated forests, participatory forest management models can be adopted where local communities participate in forest management activities. The local communities, in a resource sharing arrangement with the Forestry Commission are given harvesting permits, livestock grazing leases or some timber concessions. Communities can run beekeeping or ecotourism projects to get maximum benefits. In communal areas, the RDC together with the Forestry Commission, offer harvesting permits for resources that fall within the jurisdiction of the concerned RDC. Zimbabwe also controls its timber exports. For each consignment, an export permit should be obtained.

4.7.2 Linkages among actors in secondary forest production

Secondary forest production relationships are based on competition as well as supply and demand. The current linkages in Zimbabwe are that particle board and veneer and plywood manufacturing companies exchange logs for pulpwood on volume basis. In the communal areas there are no clear linkages between the actors because the value chain is not distinct. Links between the state and development agencies and communities must operate under a legitimate framework for profit sharing. The communities are currently commercialising forest products and ensuring the forest is protected. Communities have been introduced to appropriate technology and can do *masau* jam, extracting value from the forest products. They also export *macimbi* (*Imbrasia belina*) worms, *marula* (*Sclerocarya birrea*) oil, devil's claw (*Harpagophytum procumbens)* and honey from the honeybee (*Apis mellifera*).

4.7.3 Linkages between actors in primary forest production and secondary forest production

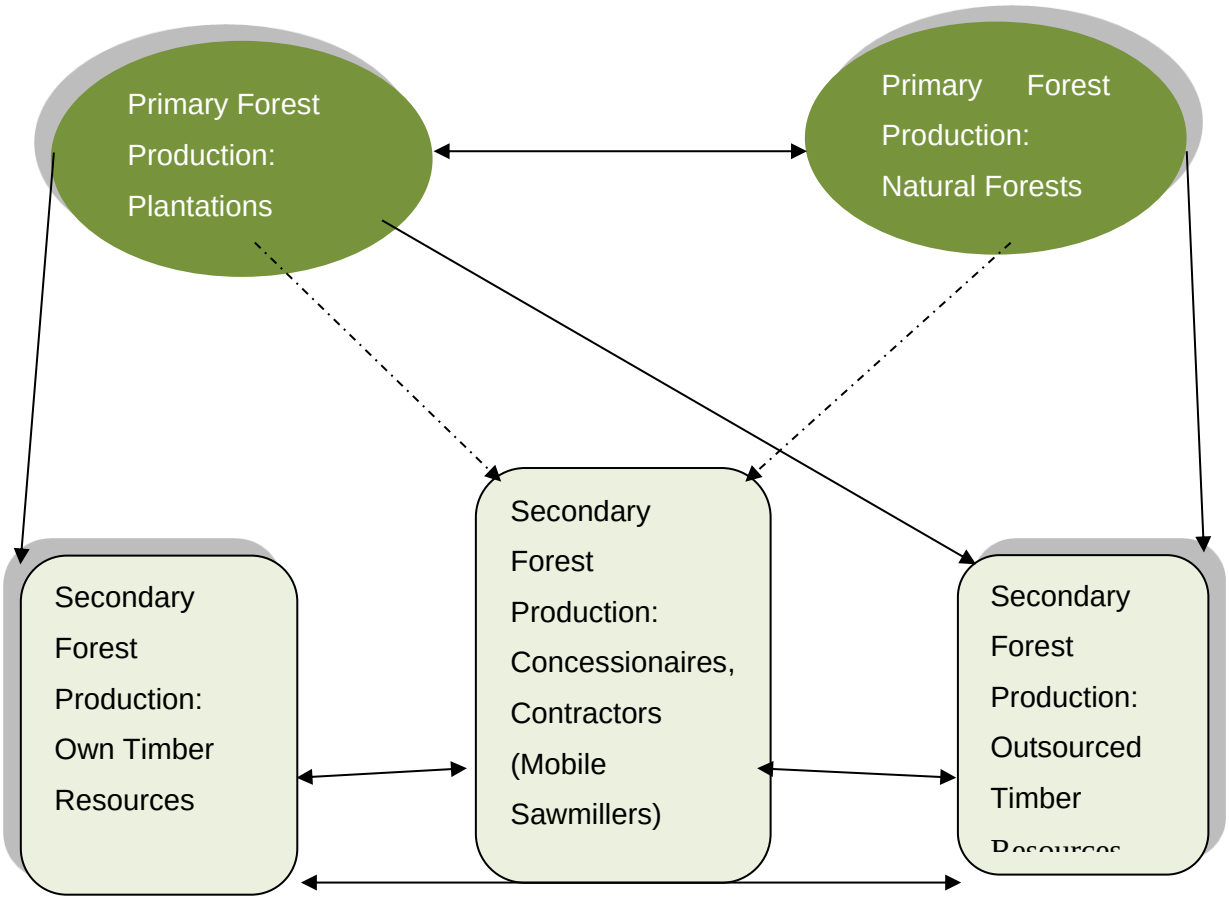

Figure 4: Linkages within primary and secondary forest production actors

4.8 Scope for public-private-partnerships

4.8.1 Current state of public-private-partnerships in forestry

Zimbabwe has private and state-owned commercial forestry companies growing hardwoods and softwoods. They constitute about 99% of the industry. The private forest companies formerly owned land until the FTLRP. Currently, the companies lease land from Government, however; they own the forest resources (timber plantations) and any other investments on the land. Timber companies practice vertical integration as they also own equipment to process timber and wood by either manufacturing furniture or building materials which is availed to markets. The remaining 1% is made up of RDCs, individual farmers and development associations, who grow trees for sale to established secondary producers since they do not have processing plants.

In terms of gazetted land, the current model has been based on three types of partnership, whereby the Forestry Commission issues concessions to private loggers who would then carry out the logging and milling activities or subcontract millers. The second model is whereby concessionaires go into partnerships with RDCs in cases

where the forest is under the jurisdiction of the RDC, and the Forestry Commission would assume a management role. The Forestry Commission is paid a 5 % supervisory fee for the role. In cases, like the Mafungautsi model, joint forest management (JFM) is in place whereby the Forestry Commission, the community and concessionaires come together to manage the forest and share benefits as agreed. The community also offers a management role to ensure the forest is properly conserved. The Forestry Commission had one concession running for two years ending mid 2015 on 800 000ha of indigenous forest. Most of the applicants for concessions failed to meet the exploitation criteria. The partnering concessionaire would share half the proceeds with the Forestry Commission. The concessionaire failed to meet the accepted quota of 8 000m^3/annum hence the contract was terminated. The concessions which are given for a 5-year period and renewed on annual basis are at most terminated during the first year since the applicants fail to take off.

In addition, private-private partnerships exist e.g., tobacco growers and tobacco buyers whereby growers are contracted and given inputs. Buyers also establish woodlots within the tobacco growing areas for tobacco curing purposes. The SAA and tobacco buyers lease land from tobacco growers to grow eucalypts for tobacco curing. This arrangement needs to be strengthened and expanded to shun the use of indigenous trees in tobacco curing and subsequent deforestation.

Communal forest land and woodland models are based on an approach where the community, a private partner, who is normally an NGO and a government department, get together for the exploitation of NTFPs/NWFPs. The communities form Community Based Enterprises (CBEs) which are made up of committees which assist with negotiating markets, commercialisation of the products and benefit sharing among the members. These PPPs help in promoting both sustainable livelihoods and natural resources management among communities (Nshimbi and Vinya, 2014; Shaheen and Khan, 2008).

4.8.2 Promising public-private-partnership models

The Zimbabwean forest sector, in view of the current economic challenges, is compelled to include the existing private companies in seeking partners for the injection of resources to make their operations sustainable. The private companies can go into partnership with surrounding communities as out-growers in return for essential social services such as schools, clinics and recreational facilities. This arrangement helps alleviate problems with arson since communities become partners in firefighting and prevention. Community leaders can also be incorporated into fire committees for a shared responsibility. Surrounding communities can be nurtured into out-growers and during the process timber companies compensate them for the opportunity costs of having foregone agricultural crops for trees. This will enhance integrated community development.

State owned companies can partner with private organisations for them to succeed. The Forestry Commission and private players with capacity and expertise in the gazetted forests can partner so that the quotas are met, environmental concerns are addressed, the allowable cut is adhered to, and recruitment or enrichment plantings are ensured. Surrounding communities can also assist with management of the

resource, especially fire management, and in return be allowed access to NTFPs and fuelwood.

The Allied Timbers may partner private business entities with capacity to offer skills, avail equipment and operating capital to ensure that all silvicultural, environmental, and logging operations are done timeously. A 100% shareholding by the state has not given enough checks and balances. So much land has been left unplanted without anyone challenging the *status quo*. Other shareholders may help to ensure that best practices based on sustainability are adhered with. This also forces the company to be profit oriented. Since land is leased from the state, the government could even extend suitable forestry land to more partners, thus increasing the forest resource base to enhance exports and subsequently forex earnings (SNV Zimbabwe, 2011).

For communal lands, the community, a private player and a government arm e.g. the Forestry Commission or the RDCs can partner for the exploitation of NTFPs e.g. Masau (*Ziziphus mauritiana*) fruit in the Zambezi valley; Mopane worms (*Imbrasia/Gonimbrasia belina*) in Matabeleland South, Bulawayo and parts on Midlands and Matabeleland North; Baobab (*Adansonia digitata*) in Manicaland, Mashonaland Central and Mashonaland West; medicinal plants, indigenous vegetables, honey, mushrooms and fruits of the Miombo woodlands. Once such a model succeeds, communities are assisted with the establishment of community woodlots as alternative energy sources thus reduced indigenous tree fuelwood exploitation. Enrichment plantings for the valuable trees from which they harvest NTFPs are also encouraged in the partnership

To create an all-inclusive forest compatible sustainable livelihoods development, the supporting measures needed include zoning of forest land capabilities and silviculture zones. Such an idea assists with further planning and expansion of the forest area. There is also need for enabling policies and legislation, for example the amendment of the Communal Lands Forest Produce Act so that it allows for the commercialisation of NTFPs. Currently, the Act prohibits the sale of NTFPs on commercial basis and this removes the sense of ownership from communities thereby subjecting forests and woodlands to the *'tragedy of the commons'* (Hardin, 1968). It is also important that NGOs and government departments working with communities consider funding and availing resources for alternative energy sources other than fuelwood from indigenous forests. The other option can be to establish woodlots which benefit the communities during the time of project implementation. The government should also have a policy for implementing partners to have commitment on the environment and energy for all projects implemented. Such clauses ensure sustainability. The government should give an opportunity to private players to invest in communication infrastructure development so that forest resources can be accessible. This can be done on Build Operate and Transfer (BOT) basis. The government, through the Forestry Commission, PWMA and EMA should give forestry the eminence it deserves just like agriculture since natural resources play a significant role in national development. Huge potential exists in Zimbabwe to create or strengthen ties between organisations, companies, and communities to link with emerging markets. Ties with local communities provide social and political legitimacy to a company and this can serve as a hedge against potential threats such as resource destruction or land invasion. Community links with companies and organizations provide a critical source of employment and the opportunity to develop business planning and management skills

that they lack. These are the skills that are prerequisite for future community-based enterprises and national growth and development.

4.8.3 Promising models that enhance social inclusion and gender equitable practices

The Forestry Commission has established linkages with NGOs in various areas of forest management. These linkages help to magnify the impacts of program investments and create multiple synergies. Long-term funding commitments enable partnerships to mature and for organisations to grow and expand their capabilities. Such approaches have helped establish projects such as The Hwange Sanyati Biodiversity Corridor (HSBC) project and the National Fire Protection Strategy. These networks function to empower local communities, generate and disseminate sound resource management practices, and formulate public policies to support and encourage such practices.

Forestry education and training

The Timber Producers Federation promotes and coordinates the plantation timber industry to recruit students for training. The industry benefits from getting graduates with the requisite knowledge and skills whilst colleges get increased enrolment and improved quality of training. The government enjoys employment opportunities created by the industry for the graduates.

National fire protection strategy

FAO offers financial support for the training of facilitators and the purchase of fire-fighting tools and equipment. EMA and Forestry Commission trains the facilitators fire management strategies with the help of experts from FAO who will then train the communities in fire prevention and suppression. Facilitators are capacitated with skills and fire-fighting tools and equipment. The peoples' values, skills, behaviour and attitudes are changed to be consistent with sustainable environmental management. Communities' benefits from reduced threats to natural environment, their lives and livelihoods. They also benefit tools and equipment, availability of pasture throughout the dry season. The country will enjoy reduced fire incidences and emergencies.

Hwange Sanyati Biological Corridor Project

The project is funded by the World Bank, and it will also give technical and institutional support for capacity building, policy advice and resource mobilisation. The government of Zimbabwe and its people will benefit from increased area under biodiversity protection, reduced poaching incidents, reduced human wildlife conflict, more forest area brought under management plans and capacity building of beneficiaries.

4.9 Trends on production, trade, and consumption of timber and non-timber products

4.9.1 Production, trade, and consumption trends

Generally, industry production trends show a decline principally because of economic challenges and not resource base constraints or capacity utilisation. However, there is need to point out that obsolete equipment within the sector has downplayed productivity capacity.

Table 19: Roundwood utilisation for various processes (production in m^3) from 2010 to 2014

	2010	2011	2012	2013	2014
Sawmills	335 021	284 422	284 422	452 239	393 920
Pole production and impregnation	170 137	65 236	65 236	74 239	40 073
Fuel wood	0	0	0	11 6239	10 420
Veneer and ply mills	8 706	13 221	13 221	0	0
Particle and fibre board mills	7 539	2 176	2 176	-	-
Pulp and paper mills	0	0	0	0	0
Charcoal kilns	54 429	48 034	48 034	0	28 166
Match factory	0	0	0	0	0
Total	575 832	413 089	413 089	642 717	472 579

Source: TPF Statistics

The production of poles and rough sawn timber was fluctuating during this period owing to the capacity of contractors. When sawmilling contractors met their quotas the production figures rose. Charcoal production reached a record high in 2010 then dropped to a point where production stopped in 2013 due to lack of ready market. Fuelwood got a boost from 2013 because tobacco farmers were prohibited to use firewood from indigenous trees to cure tobacco and it was also used in urban areas due to unreliability of electricity. Veneer and plywood production recorded a marked increase until 2012 then dropped due to viability problems and market shrinkage. Paper and paper products, and matches did not produce anything from 2010 to 2014. This was attributed to the closure of Mutare Board and Paper Mills in November 2009 and the Lion Match Zimbabwe due to viability challenges.

Table 20: Indigenous hardwood species standing volumes in gazetted forests

Forest	Total area (ha)	Total over bark volume to 15cm tip diameter (m^3)		
		Species		
		Baikiaea plurijuga	*Guibuortia coleosperma*	*Pterocarpus angolensis*
1994				
Kazuma	24 000	1 323 961	724 586	3 547
Fuller	24 700	6 188 685	29 646	1 337 364
Umzibane	2 471	2 011	3 028	411 094
1997				
Gwaai	144 300	22 647 213	201 638	-
Kazuma	24 000	1 407 229	883 103	-
Fuller	24 700	5 863 238	43 316	1 112 795
1998				
Ngamo	102 900	6273598	8 808 388	2 725 060
Gwampa	47 000	14960691	-	-
2002				

Forest	Total area (ha)	Total over bark volume to 15cm tip diameter (m^3)		
		Species		
		Baikiaea plurijuga	*Guibuortia coleosperma*	*Pterocarpus angolensis*
Kazuma	24 000	855 039	-	-
Fuller	24 700	4 382 255	10 046	71 233
2006				
Gwampa	47 000	14 984 588	-	-
Ngamo	102 900	5 430 261	7 701 894	-
2012				
Ngamo	102 900	5 430 260	3 674 167	1 156 240
Gwampa	47 000	15 508 184	-	-
2015				
Gwaai	144 300	23 265 781	98 718	-

Source: Forestry Commission Inventories

Inventories are usually done when there is need to award a concession in a forest, so inventories are not conducted in all forests within a given year or period. The Forestry Commission has a great challenge in conducting inventories due to financial constraints. Inventories are done before the harvesting period though regular ongoing inventories have been done for some forests like Fuller and Gwaai to assist in refining management plans. Volumes for the commercially valuable species (*B.plurijuga, G.coleosperma* and *P.angolensis*) are estimated using the Banks and Burrows functions (see Annex). Before 2006, standing timber volumes significantly dropped because of the Fast-Track Land Reform as people moved into demarcated forests cutting down trees for construction and opening land for cropping purposes. Forest fires also destroyed trees and some timber was lost to poachers exporting round timber. From 2006, to 2017, volumes stabilised owing to the ban on unprocessed export and the strict requirement for an export permit for each consignment. International markets also need timber from sustainability certified forests.

Generally, there is a decline in local sales of sawn timber and treated poles with an increase in 2012. Particle fibre has been on the increase in sales from 2010 to 2012. Pulp and paper imports contribute 90% of the national requirements whilst 10% is met by the Kadoma Pulp and Paper mill. Wattle extract and charcoal are generally produced for the export market whilst the country imports almost the same quantities for domestic use. The only company which produces charcoal is the Wattle Company. For matches, the country is not producing any; however, figures for imports are not readily available.

Table 21: Sales for the Year 2010 to 2014

Product	2010			2011			2012			2013			2014		
	Sales (Thousand US$)			Sales (Thousand US$)			Sales (Thousand US$)			Sales (Thousand US$)			Sales (Thousand US$)		
	Local	Export	Import	Local	Export	Import	Local	Export	Import	Local	Export	Import	Local	Export	Import
Sawn timber	24 637	22 637	0	19 687	9 021	0	28 312	17 334	0	-	48 500	-	-	-	-
Treated poles	1 999	2 672	0	1 197	1 239	0	4 712	3 035	0	-	7 500	-	-	-	-
Veneer and plywood	2 943	1 045	0	0	0	0	0	0	0	-	-	-	-	-	-
Particle fibre and board	1 845	565	0	3 025	1 038	0	3 025	1 038	0	-	6 600	-	-	-	-
Paper and pulp	14500	0	11 27 00	1220 0	0	128 700	118 00	0	129 100	127 00	-	114 200	118 00	0	114 40
Wattle Extract		2 951	44	0	302 8	1	0	194 7	90	0	168 7	20	0	225 7	0.2
Wood articles and charcoal	412	18735	16 03 9	0	268 32	220 35	0	284 59	243 81	-	269 44	201 43	-	251 78	201 41
Honey		1962	47		260 4	59		373 3	126	-	211 1	185	-	963	218
Matches	0	0	-	0	0	-	0	0	-	0	0	-	0	0	-

Source: TPF Annual Reports NB: Sales figures compiled by the TPF are obtained from its member companies. (-) denotes data unavailability.

The sale of timber products which included sawn timber, particle and fibre boards, poles, charcoal and wattle extract recorded sharp increases in their export earnings; however, other products like veneer and plywood sales plunged as there were no sales after 2010. Paper and paper products and matches followed the same trend as they did not record any sales from 2010 to 2014. This was attributed to the closure of Mutare Board and Paper Mills in November 2009 together with the newsprint firm and Lion Match Zimbabwe due to viability challenges. Sales also dropped after 2013 as companies continued downsizing due to non-viability.

4.9.2 Forecast on future production, trade, and consumption of timber and non-timber products

Zimbabwe's commercial forest plantations are generally managed for specific mercantile end uses. Accurate projections of volume of wood that reach maturity in the next 10 years (to 2024) may be obtained through the knowledge of the age-class distribution under specific set of forest areas, growth and demand assumptions. Failure by companies to replant harvested areas, forest fire impacts and pest damage has reduced the stock by 25-30%. Though demand continues to grow over the years, for poles minimal expansion of plantation resources is expected if current plantations are reforested and sustainably managed over the next 10-year period, mostly with softwoods. The forecast for future production used a prediction model (adopted from South Africa (Hassan *et. al*; 2002, Hassan, 2000) (see Annex 1). Local consumption is expected to decline and pick slightly after 2018 with export market performing better over the years (Table 22). For indigenous hardwoods, the production volumes (Table 20) are likely to remain constant assuming that companies manage to engage partners with capacity. Non timber forest product volumes and trade are difficult to project as there are no official statistics since NTFP are traded informally.

Table 22: Projected industrial wood and fibre production, consumption, and trade estimates for 2014 to 2024

Year	Production volumes (m^3)		Local consumption (m^3)		Export (m^3)		
	Exotic softwoods	Exotic hardwoods	Industrial wood	Fibre	Sawn-timber	Fibre and particle boards	Treated poles
2014	13 988 594	1 039 128	197761	126990	27706	49878	39657
2015	14 282 354	1 068 224	187873	120640	28260	50876	40450
2016	14 582 283	1 098 134	178479	114608	28826	51893	41260
2017	14 873929	1 128 882	169555	108878	29402	52931	42085
2018	15 171 408	1 160 490	161077	103434	29990	53990	42926
2019	15 490 008	1 192 984	163494	104985	30890	55609	44214
2020	15 815 298	1 226 388	165946	106560	31817	57278	45541
2021	16 131 604	1 260 727	168435	108158	32771	58997	46907
2022	16 470 368	1 296 027	170961	109781	33754	60766	48314
2023	16 816 246	1 332 316	173526	111427	34767	62589	49764
2024	17 169 388	1 369 621	176129	113098	35810	64467	51257

Source: TPF and Forestry Commission models

4.10 Contribution of private forestry sector to local livelihoods and the national economy

4.10.1 Contribution of the private forestry sector to local livelihoods

Forests have many functions which are critical to the livelihoods of rural poor populations. The functions include forest foods, fodder, shelter, medicines, construction materials and firewood for energy. Contributions of private forestry to livelihoods include out-grower schemes, such as the Manica Boards and Doors out-grower scheme with communities within Manicaland and Mashonaland East. Farmers grow trees for a period of 5 years which then become due for pulpwood and are bought at US$5per cubic metre for producing, $9 to $15 for transportation to the plant and $35 for felling, crosscutting, debarking and loading to lorries. This income is significant to the livelihoods of communities as the trees continue to regenerate and have minimum maintenance.

The private forestry sector also provides direct employment to members of the community who get paid monthly salaries with employment benefits such as pensions, medical aid, and bonuses. Communities are also beneficiaries of casual and seasonal employment in forest estates and are normally engaged during the rainy season for planting and clearing of fireguards at the onset of the fire season. Within the eucalyptus hardwood plantations, employees and communities have special arrangements for installing beehives. They sell the honey for US$3/500ml or more. Edible indigenous miombo mushrooms from conservation areas within estates are harvested and sold at about $1/250grammes to motorists or private companies such as Selby.

More importantly, communities also have access to social services such as estate schools, recreational facilities, transport, and clinics. In communal areas, indigenous fruits and mopane worms are sold in market places and roadsides at varying prices after having been collected from the forests and woodlands. Other benefits to local livelihoods include free forage and pasture of community livestock in plantations, and in addition, collection of fuelwood for domestic use. Better resourced members of the community enter into contracts and concessions with the private companies for silviculture, harvesting and saw-milling. The use of the forest products adds crucial dimension to a diversified livelihood base, thus acting as a safety net, particularly in complementing agricultural production. Though the commercialisation of NTFPs is a growing phenomenon throughout Sub-Saharan Africa (Campbell *et al.,* 2001; Shackleton, 2002), initiatives are being done by NGOs to formalise their commercialisation at household levels within the same community and external markets.

The seasonal availability of some of the NTFPs and competition limit the amount of income obtained from them, making their contribution to annual household income becomes very low (Sola, 2004); unlike in countries like South Africa, where NTFPs were found to contribute about a quarter of total livelihood income (Shackleton *et al*, 2007). The collection of NTFPs is a major cash income source to the rural people's livelihoods. Fuelwood contributes 60% of energy requirements in the country.

5.10.2 Contribution of the private forestry sector to the national economy

Over 90% of Zimbabwe's indigenous forests have little or no commercial timber but provide a wide range of NTFPs and services whose economic values are not captured in the nation's GDP (Shumba, 2001). The indigenous forests also provide a variety of goods and services such as medicines and wildlife habitat. The commercial forestry sector contributes about 3% to the GDP which is derived from the combined value of wood harvested in exotic tree plantations. Current statistics indicate that agriculture including forestry contributes 20.1% to the GDP but no disaggregation is made to reflect the contribution of forestry separately. There is, however, need to boost revenue for the timber sector so that it makes more significant contribution to the economy. In 2014, commercial forestry employed 3 833 people in the primary and secondary production sectors unlike the earlier years when it engaged more than 10 000 employees.

4.11 Promising public-private-partnership models in forestry

Promising PPP models in the forest sector are not limited to the following but include;

1. Private commercial plantation companies partnering with sawmilling and silvicultural contractors.

2. Private commercial plantation companies partnering with resettled farmers as out-growers while the companies buy and process the timber.

3. State owned commercial companies i.e., Allied Timbers, partnering with private business organisations.

4. The state partnering with ex-commercial farmers where it leases land for plantation forestry

5. The Forestry Commission partnering with private companies who have capacity to exploit timber in gazetted forests.

6. Community partnering with a private player like an NGO, and a government arm, for the exploitation of NTFPs,

The contractors and out-growers inject resources to make the large private companies operations sustainable. Sawmilling contractors utilise small diameters which would be thinned to waste whilst those in silviculture carry out pruning and thinning operations that improve the quality of logs and timber, thus leading to increased recovery in the sawmills. State owned companies need to partner with private organisations; for example, the Forestry Commission and private players in the gazetted forests. The Forestry Commission has to offer private players with expertise and capacity to partner with them so that their quota is met, environmental concerns are addressed, the allowable cut is adhered to, and recruitment or enrichment plantings are secured. The private players will bring technical expertise (skills), buy new equipment and operating capital. Surrounding communities can also be brought in to help with management of

the resource, especially fire management, and in return be allowed access to NTFPs and fuelwood. For the state-owned commercial sector, the Allied Timbers, can partner with a business organisation that brings in operating capital and some technical experts to ensure that best practices on sustainability are adhered to with adequate checks and balances. The state can extend its land, which is suitable for forestry, to business minded ex-commercial farmers who bring in their skills in production, thus increasing the forest resource base to boost production. In communal lands, the community, a private player like SAFIRE and a government arm e.g., the Forestry Commission or the Rural District Council, can partner for the exploitation of NTFPs. The private partner supports the communities in sustainable exploitation of NTFPs, link the communities to lucrative markets, train the communities on business skills, sustainable harvesting of the resources and product development.

5. CONCLUSIONS AND RECOMMENDATIONS

Strengthening of the forest sector originates from recovery point of view of an industry which had plunged to rock bottom due to economic meltdown from the late 1990s to date. The forest sector had had a history of primary and secondary growth, with a timber resource base enough for both domestic consumption and export but capacity utilisation fell below 20%. The low-capacity utilisation resulted from power cuts, lack of competent staff and obsolete manufacturing plants. The sector cannot recapitalise due to economic challenges. Although this scenario is characteristic of the manufacturing industry across the country, the forestry sector has the potential to enter public-private-partnerships to revive the sector.

One of the advantages the forest sector has is the subscription to regulatory mechanisms and consciousness of the need for gender consideration in the mainstream economy. The agriculture and forestry sectors are the lifeline of the economy and the high percentage of women employed in the sector should point towards their full participation in decision making in the sector. The averages of 30% women participation can be used as a baseline in affording them growth opportunities within the forestry sector and empowering them within areas of their strength and expertise.

Public -private-partnerships in the forest sector have a great opportunity for uplifting the sector from the current situation. In an environment which is thirsty for direct foreign investment, partnerships with capacitated players will remodel the forestry sector for win-win outcomes. The external partners will fund recapitalisation of the existing forest resources base exploitation. The future projections of timber and non-timber products can only be meaningful with PPPs, even though NTFPs have been traded informally, they can be upscaled into the mainstream activities to minimise leakages. The contribution of forestry can thus be raised from the current 3% to GDP.

To facilitate the development of vibrant private forest sector in the presence of effective PPPs in the country, it is recommended that:

1. Policies and strategies that aim at improving the welfare of rural people and natural resource conservation give attention to the contribution of NTFPs to the local people and national economy.

2. The government and NGOs formalise trade of NTFPs, strengthen support and encourage NTFP based activities as part of diversified livelihood strategies.

3. The current PPP institutional framework gets implemented in clarity and is not conflicted with the Indigenisation Policy. Government should quickly adopt and implement a proper legal and institutional PPP framework since the current one requires that the relevant ministry becomes the guarantor whilst government bureaucracy brings about unnecessary bottlenecks.

4. The government strengthens political will and provides a conducive environment to attract foreign direct investment. The country should shun corruption to attract both local and foreign investors.

5. Commercial plantation owners seriously consider re-planting to sustain resource availability, and simultaneously the Forestry Commission should enforce the statutory instrument on re-planting as a matter of urgency.

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APPENDIX B

Volume growth measures were calculated using growth simulation models together with timber data of area planted by species and age from Timber Producers Federation Report. The following timber growth simulation models were used to calculate change in timber volumes (growth):

$$V_{pinus\ patula} = 453.171(1 - e^{-0.157A})^{4.166}$$

$$V_{pinus\ elliotti} = 503.740(1 - e^{-0.103A})^{2.877}$$

$$V_{eucalyptus} = \frac{510(1 - e^{-0.2A})^{4.170}}{1.47}$$

Where V is volume of species and A is age of species

These growth simulation models were found to be appropriate for the use in the Zimbabwean situation because South Africa were they were adopted and Zimbabwe share the same climatic conditions and are in the same region.

For indigenous hardwoods the standing timber volume was estimated using the formula given;

This volume comprises the millable stem volume to a tip diameter of 15 cm and is estimated using the BANKS and BURROWS functions, which have the general form:

V_{timber} (m^3 o.b.) = a + b * Tree Basal Area (m^2)

The original coefficients have been converted for metric units and read as follows:

Species group	Constant a	Factor b
Pterocarpus, Brachystegia, Julbernardia, Erytrophleum	-0.335	9.423
Baikiaea,Kirkia, Combretum	-0.219	6.9764
Guiburtia, Burkea, Afzelia, Sclerocarya, others	-0.225	6.997

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