

Why don't we make the loggers pay?

Stumpage value and policy failure in Ghana's forest sector

Gene Birikorang

Country Report

February 2015

Forests

Keywords:

Forestry, Forest Governance Learning Group, Natural resource management

iied



Civic
Response

About the authors

Gene Birikorang, Hamilton Resource Consultants, Accra, Ghana.
birikorang,hrc@gmail.com

Acknowledgements

The author would like to thank colleagues in Civic Response in Ghana and the International Institute for Environment and Development in the UK for enabling this work, for collaboration throughout, and for reviewing earlier drafts. This document has been produced with the financial assistance of the European Commission and UK aid from the UK Government. Its contents are the sole responsibility of the author and do not necessarily reflect the views of the European Commission, the UK Government or the institutions involved in this initiative.

About Civic Response

Civic Response is a leading natural resource and environmental governance policy advocacy organisation working to entrench resource rights. Founded in 2003 in Accra, Ghana by a group of activists with experience in resource rights campaigns both locally and globally, Civic Response undertakes activities which address the policy needs of communities who depend directly on natural resources, particularly forests. We are actively engaged in the global climate change discourse especially as it relates to forests.

Produced by IIED's Forest Governance Learning Group

Since 2003, the Forest Governance Learning Group (FGLG) has been facilitated by the International Institute for Environment and Development (IIED), with teams active in 10 countries in Africa and Asia (Cameroon, Ghana, Uganda, Tanzania, Malawi, Mozambique, South Africa, India, Indonesia, and Vietnam).

Over more than a decade, FGLG has built its capability to influence policy and improve decision making about forests – researching issues with marginalised communities, connecting diverse groups of opinion formers, and applying practical tools.

First published by International Institute for Environment and Development (UK) in 2015

Copyright © International Institute for Environment and Development

All rights reserved

Birikorang, G. (2014) *Why don't we make the loggers pay? Stumpage value and policy failure in Ghana's forest sector*. Civic Response, Accra, and International Institute for Environment and Development, London.

<http://pubs.iied.org/13576IIED.html>

ISBN 978-1-78431-130-8

Printed on recycled paper with vegetable-based inks.

International Institute for Environment and Development
80-86 Gray's Inn Road, London WC1X 8NH, UK
Tel: +44 (0)20 3463 7399
Fax: +44 (0)20 3514 9055
email: info@iied.org
www.iied.org

 @iied

 www.facebook.com/theIIED

Download more publications at www.iied.org/pubs

Stumpage fees due from the timber industry are a key component of forest communities' welfare and contribute to the cost of forest management and timber regulation. Yet, as the research presented in this report shows, the Forest Commission's failure to review stumpage in Ghana has led to millions of dollars of lost revenue from stumpage fees over the period 2003–2012. The report outlines the underlying reasons for this noncompliance, the implications of non-review for forest resources management and makes recommendations to address shortcomings and inform future policy actions to protect the interests of the state and forest owners in forest tax imposition.

Contents

Summary/ Preface	4	4 Discussion and way forwards	16
Definitions	5	4.1 Policy issues	
Acronyms	6	4.2 Potential risks for conflicting revenue and environmental objectives	
Background/Abstract	7	4.3 Risk of revenue loss through timber laundering	
1 Introduction	8	4.4 Timber industry performance and development indicators: knowledge gaps	
1.1 Background		5 Recommendations	20
1.2 Immediate research objectives		5.1 Managing a fiscal transition under VPA	
1.3 Structure of the report		5.2 Specific recommendations	
2 Research approach and findings	10	References	22
2.1 Research approach		Appendices	23
2.2 Methodology			
3 Findings	12		
3.1 Provisions under LI 1649 and implied FC mandate			
3.2 FOB value of air-dried lumber (ADL)			
3.3 Timber harvest volume and structure: impacts on stumpage fee levels			
3.4 FC stumpage policy management 2003–2012			

Preface

The Forest Governance Learning Group (FGLG) is a forum of policy discussants operating across seven African countries and three Asian countries¹ coordinated by the International Institute for Environment and Development (IIED).² Its focus is social justice in forestry. Its objective is to study and catalyse national and sub-national forest governance reform processes by improving tactical responses. Participants include administrators, analysts and activists interested in the agenda of the forest-marginalised. FGLG activities include participatory learning and analysis, capacity building, network support, governance tool development and where appropriate direct intervention. It also engages with international forest policy processes such as the Voluntary Partnership Agreement (VPA) on forest governance and trade between Ghana and the EU, and Reduced Emissions From Deforestation And Forest Degradation (REDD). The FGLG is convened by Civic Response in Ghana. Civic Response is also the secretariat for Forest Watch Ghana (FWG), a coalition of forest-sector NGOs and individuals.

FWG is interested in forest governance reforms that advance the resource rights of marginalised groups and resource communities. FWG has long been a campaigner for reforms in the forest fiscal regime and benefit-sharing arrangements to give greater value to resource owners and to ensure equity. It has also campaigned for a rationalisation of the current economic model of forestry which seems unable to promote resource sustainability or economic development. FWG has recommended the need for greater transparency by the Forestry Commission (FC) in the framework of further policy reforms backed by a strict adherence to forest-sector laws, particularly those that govern the timber industry. FWG is still interested in strict adherence to the law as required by the Forest Law Enforcement, Governance and Trade Voluntary Partnership Agreement (FLEGT-VPA) to ensure greater recovery of revenue from forest resources which are exploited. Part of the advocacy plan for 2013 intended to increase the campaign's momentum for fair benefit sharing by examining the revenue loss to the state and to resource owners due to the non-enforcement of stumpage arrangements.

¹ Cameroon, Ghana, Malawi, Mozambique, South Africa, Uganda, Tanzania, India, Indonesia and Vietnam. A platform for opinion-formers addressing issues of forest policy related to China and India in Africa is also being explored.

² See: www.iiied.org/natural-resources/key-issues/forestry/forest-governance-learning-group

Definitions

FOB	FOB or 'free on board' is the contract price for timber or wood product exports, and is represented by the value of the product when laden on the shipping vessel or any other carrier of the consignment.
Inflation indexing	This is a macro-economic procedure for adjusting the current value of a commodity or service by the extent of price increase over a previous period, such as to maintain the purchasing value of that commodity or service. This ensures that the quantum of commodity or service purchased in the current period is the same as that purchased in the previous period.
Stumpage fees	This is the amount of tax imposed on the value of the standing tree.
Stumpage rate	This is the indicator of the portion of the value of timber or timber price set aside as a forest tax or stumpage fee. It is assumed to have taken into consideration all costs of producing the timber, loading, transport and handling costs, as well as profit of the operator.
Timber price	In the general fiscal context, it is the value of the standing tree; in the context of the LI 1649 stumpage formula, it is the gross value of timber at the processing point.
Trigger	This is the prior policy action that is expected to be in place by a dateline as a condition for release of donor support under multi-donor budget support programmes.

Acronyms

ADL	Air-dried lumber
CSO	Civil society organisation
CvR	Civic Response
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FC	Forestry Commission
FGLG	Forest Governance Learning Group
FLEGT	Forest Law Enforcement, Governance and Trade
FOB	Free-on-board
FPIB	Forest Products Inspection Bureau
FSD	Forest Services Division of the Forestry Commission
FWG	Forest Watch Ghana
HRC	Hamilton Resources and Consulting
LI	Legislative instrument
MLNR	Ministry of Lands and Natural Resources
MoFEP	Ministry of Finance and Economic Planning
MTEF	Medium-term expenditure framework
NREG	Natural Resources and Environmental Governance Project
PSCLF	Parliamentary Select Committee on Lands and Forestry
REDD	Reduced Emissions from Deforestation and Forest Degradation
RMSC	Resource Management Support Centre
SRA	Social responsibility agreements
TEDB	Timber Export Development Board
TIDD	Timber Industry Development Division of the Forestry Commission
TIF	Timber information form
TUC	Timber utilisation contract
VLC	Verification of Legal Compliance
VLO	Verification of Legal Origin
VPA	Voluntary Partnership Agreement

Abstract

The Forestry Commission is mandated to charge stumpage fees. According to legislation, stumpage fees represent royalties to the landowner and charges for the cost of felled timber which provide a basic return to the landowner and contribute to the cost of forest management and timber regulation. But between 2003 and 2012, forest revenue from this has lost approximately US\$ 16 million in real value –equivalent to four times the potential contribution of the timber industry to forest communities' welfare under social responsibility agreements (SRAs).

This research paper examines the fiscal performance of the Forestry Commission in the context of legislative provision and other reform criteria for safeguarding the real value of stumpage fees due from the timber industry. It further examines the undercurrents of FC's management of the forest fiscal system, including the focus of political decisions in addressing forest fiscal policy, sector management of the fiscal regime, and the limitations of institutional regulations at both key levels of institutional regulation: Resource Management Support Centre (RMSC) and Timber Industry Development Division of the Forestry Commission in Ghana (TIDD).

Key issues are drawn from observations made and discussed to inform the way forward. These include the lack of support for a rational forest fiscal policy that addresses both forest community interests and the need to invest in the Forestry Commission; potential risks for conflicting revenue and environmental objectives; the risk of revenue loss through timber laundering; and the challenges and implications of an empirical industry knowledge gap confronting TIDD.

Recommendations are made to address these shortcomings at two broad levels. First, the paper recognises that many of the issues it addresses border on the Ghana-EU Voluntary Partnership Agreement Protocols. At the second level, the paper recognises that there is a need to address other issues that relate to policy and governance reforms that are not provided under legislation and therefore lie outside the VPA. In the short term, it is envisaged that policymakers will address the need to restore real value to stumpage and in the medium to long term manage a fiscal transition to bring on board the long-term development of the VPA implementation as a neutral (incentive-based) forest fiscal regime.

Keywords: Timber price; stumpage rate; stumpage fees; inflation indexing

Introduction



1.1 Background

Forest Watch Ghana (FWG) has observed that the Forestry Commission (FC) does not comply with provisions of the Timber Resources Management Regulation LI 1649 which require the Commission to update stumpage fees quarterly. According to LI 1649 21(2), stumpage fees represent royalties to the landowner and charges for the cost of felled timber which provide a basic return to the landowner and contribute to the cost of forest management and timber regulation (Government of Ghana, 1998). Thus, as a result of the non-compliance of FC, the interests of the state and forest owners in forest tax imposition and appropriation have not been protected. According to Schedule 3 of LI 1649, 'Timber price is 35 per cent of the free-on-board (FOB) value of air-dried lumber of the species (i.e. estimated roundwood equivalent), based on the previous quarter's average of such exports as published from time to time by the Forest Products Inspection Bureau' (ibid). The FC has not, by implication of a mandatory quarterly review, complied with regulations since 2004. This implies a loss of revenue to the state and resource owners.

1.2 Immediate research objectives

Civil society is interested in assessing the impacts of value loss through the non-review of stumpage compounded by the long-term effects of resource depletion and seeks to conduct a two-phase study into these impacts. The immediate objective of this research is to assess the extent of real revenue loss to the state and forest owners and the underlying causes for the failure of FC to review stumpage fees. The scope of work is described in more detail in the specific terms of reference for the research (Appendix 1).

1.3 Structure of the report

This report is organised into four sections. Section 2 briefly sets out the approach to the research and its methodology. Section 3 presents findings of the research. Section 4 discusses emerging important issues from the research's findings and makes specific recommendations to address FWG's concerns as interpreted from the scope of work included in the terms of reference.

Research approach and methodology



2.1 Research approach

The research approach involved regarding stumpage fee payment as a fiscal 'policy' rather than in the context of its actual levels or rates of collection. This permitted a logical treatment of issues relating to the current mandate of FC and the legitimacy of possible future policy actions. From these considerations, it has been more convenient to draw conclusions on their implications for forest resources management and the Voluntary Partnership Agreement with the EU.

2.2 Methodology

The following methodologies were used:

- Collecting and analysing annual timber information form (TIF) reports from RMSC Reviewing stumpage fee rates for the period 2003–12 with FC
- Determining stumpage rates and fees due from harvested timber species
- Analysing trends in air-dried lumber (ADL) FOB prices over the period 2003–12 and the real (hidden) impact of inflation on the purchasing power of stumpage value as primarily determined by FOB prices over the same period
- Examining and analysing species volume and values according to their market classifications
- Analysing the implications from research results and recommendations, and
- Producing a report containing findings of the research, a discussion of important emerging issues and recommendations on ways forward.

Findings

3

3.1 Provisions under LI 1649 and implied FC mandate

Regulation 22(2) of LI 1649 provides the basis for calculating the stumpage fee payable in respect of any timber. Schedule 3 of the Regulations sets out the formula for calculation (see Box 1).

3.2 FOB value of air-dried lumber (ADL)

The free-on-board price (FOB) is the most flexible component of the stumpage formula, because it is based on publicised export prices of ADL. According to Schedule 3 of LI 1649 (Box 1), the stumpage value must, for any specific period, depend on the previous quarterly export prices as advised by TIDD's export permit report. This implies that at least, in consideration of this factor, stumpage fees should be published by FC in every quarter, whether FOB prices change or not; and in order that current stumpage fee levels may bear an unchanged relationship to the Ghanaian Cedi value of exports – assuming there were no changes in the other factors determining their levels (a) percentage of timber price (35%) and (b) stumpage rate.

3.2.1 Timber price

In the stumpage formula, the price of timber is related to the FOB value of ADL. It is not directly referenced from external market prices for timber, which could transparently be published as is done with ADL in TIDD's export permit reports. While global evidence could lend support to a validation of the FOB value as published, 'timber price' as derived depends more on domestic empirical evidence or some validated research results. Determining timber price was an issue prior to LI 1649 coming into force. Under-pricing of timber in the 1990s resulted in over-harvesting as the timber industry did not have any incentive to improve its efficiency of timber recovery (Birikorang et al. 2001). Meanwhile, the industry considered that the high cost of production did not warrant an increase in stumpage fees. Thus, any adjustment in the timber price factor (percentage of FOB value of ADL) required, at the time, some level of consensus before it could be admitted into legislation. Historically, the Parliamentary Select Committee on Lands and Forestry (PSCLF) had insisted on this prior to the passing of LI 1649. The FC subsequently complied with the PSCLF suggestion and reached consensus with the timber industry to set the percentage of FOB price at 35 per cent. This set a precedent for this procedure which may be applied in the future.

3.2.2 Stumpage rate

The Forestry Commission classifies species according to their market strength and status of inventory. The rates

BOX 1. FORMULA FOR CALCULATING STUMPAGE FEES

Stumpage fee = Tree Volume x Timber Price x Stumpage Rate

Where:

Tree Volume is computed in cubic metres according to the measurements taken of each tree felled)

Timber Price is 35% of the free-on-board (FOB) value of air-dried lumber of the species, based on the previous quarter's average of such exports as published from time to time by the Forest Products Inspection Bureau.

Stumpage rate for each timber species is the percentage specified in Schedule 3 of these regulations (See Appendices 2 and 3).

Source: LI 1649, Schedule 3 Regulation 22 (2)

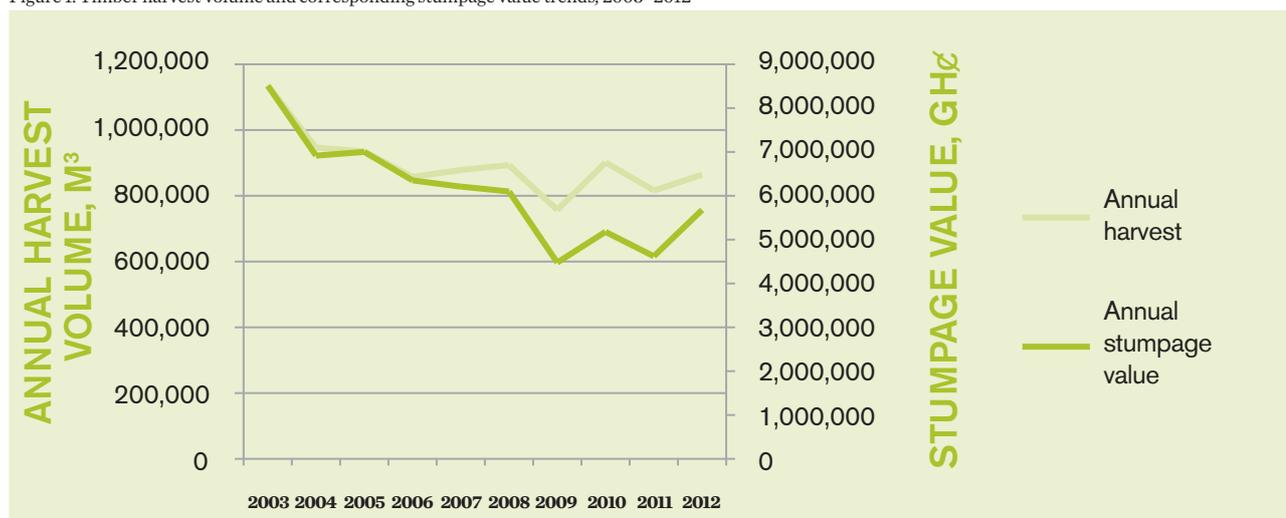
vary between 5 and 20 per cent, depending on the classifications: 'high' (20 per cent), 'moderate' (10 per cent) and 'low' (5 per cent) demand. The classification of species is based on FC's informed decision, which appears as Schedule 2(1) to LI 1649 (see Appendices 2 and 3). Depending on their market status, species could be placed under the appropriate point on the graduated scale. Similar to quarterly reviews of FOB price, but not necessarily with the same frequency of publication, FC would be required to publish changes and accordingly reflect them in the graduated scale, as a matter of policy.

When combined, the timber price of 35 per cent, FOB of ADL and stumpage rate determine the value of raw timber in a unit of ADL. Decisions on these indicators are a matter primarily for policy, and not legislation. The stumpage rate in the formula is an indicator that suggests what proportion of the value of timber after cost of production, transport and profit remains as the residual value, which should be the target of taxation. It is still the responsibility of policy to prevent a depreciation of the value of stumpage.

3.3 Timber harvest volume and structure: impacts on stumpage fee levels

Over the ten-year period studied (2003–2012), both official (legal) timber harvest and stumpage fees revealed declining trends (Figure 1). The declining trend was more drastic in the stumpage value of harvests than with legal harvest volumes. This suggests that the average Cedi value of stumpage has been on the decline. Particularly after 2005, increasingly higher proportions of

Figure 1. Timber harvest volume and corresponding stumpage value trends, 2003–2012



moderate- and low-demand species of the national total have been harvested, conforming to expectations from earlier studies (Birikorang *et al.* 2007; Mayers *et al.* 2008). This is largely due to the depletion of primary species caused by over-exploitation by industry. Thus, towards the second half of the period a stabilisation trend in the volume of timber was accompanied by a generally declining trend in stumpage revenue. In 2012, expected stumpage fees stood at Gh¢ 5.7 million, compared to Gh¢ 8.5 million in 2003 (Figure 1).

3.4 FC stumpage policy management 2003–2012

In 2003, the FC board approved stumpage fee rates to be increased progressively throughout the year to avoid any shocks to the industry. As of 1st October 2013, and according to FC's corporate division, the stumpage fee levels represented 75 per cent of the 2003 target. The 75 per cent adjustment was also achieved at the end of 2003. Thus, from 2004 to 2012, stumpage fees have remained unchanged (Appendix 2).

A comparison of FC's applied structure of stumpage rates and the schedule of stumpage rates as provided under Regulation 22 (1) indicates that there has been no change in the structured ratings for timber species (Appendix 2). Over the last two decades, the industry has introduced more than 30 species to the export market. However, at present, there are a number of species that could be counted among the species now traded on the export market and, to a lesser extent, the domestic market that have remained in their old market classifications. Thirteen species could potentially be upgraded (Table 1). This deficiency can be linked to the contrasting trend in timber harvest volumes and their corresponding values.

TIDD's periodic market intelligence should have brought a progressive shift of these moving species up through the various market categories, as the relative strengths of market demand would have suggested.

The impact of FOB pricing and its adjustment for inflation were also studied during the research period. Theoretically, trends in the Cedi equivalent of FOB prices for ADL analysed indicate, generally, a steady

Table 1. Potential species movements in market categories

LOW DEMAND SPECIES		MODERATE DEMAND SPECIES	
Current list	Potential species for categorisation under 'moderate' demand	Current list	Potential species for categorisation under 'high' demand
Essa, Danta, Otie, Potrodom, Denya, Wawabima, Wonton, Chenchen, Dahoma, Others	Danta Chenchen Dahoma (3 species)	Papao, Awiemfosamina, Aprozuma, Bediwenua/Canarium, Onyina, Akasa, Shedua Ayan/Bonsamdua, Edinam, Guarea, Nyiangon, Kaku, Mansonia, Koto/Kyere, Onyinakoben/ Bombax, Emire, Ofram, Wawa, Rosewood/Kpatro, Avodire	Papao, Awiemfosamina, Bediwenua/Canarium Akasa, Edinam, Nyiangon, Mansonia, Koto/Kyere, Wawa, Avodire (10 Species)

Table 2. Summary of period analysis of stumpage loss (GH₵ thousands)

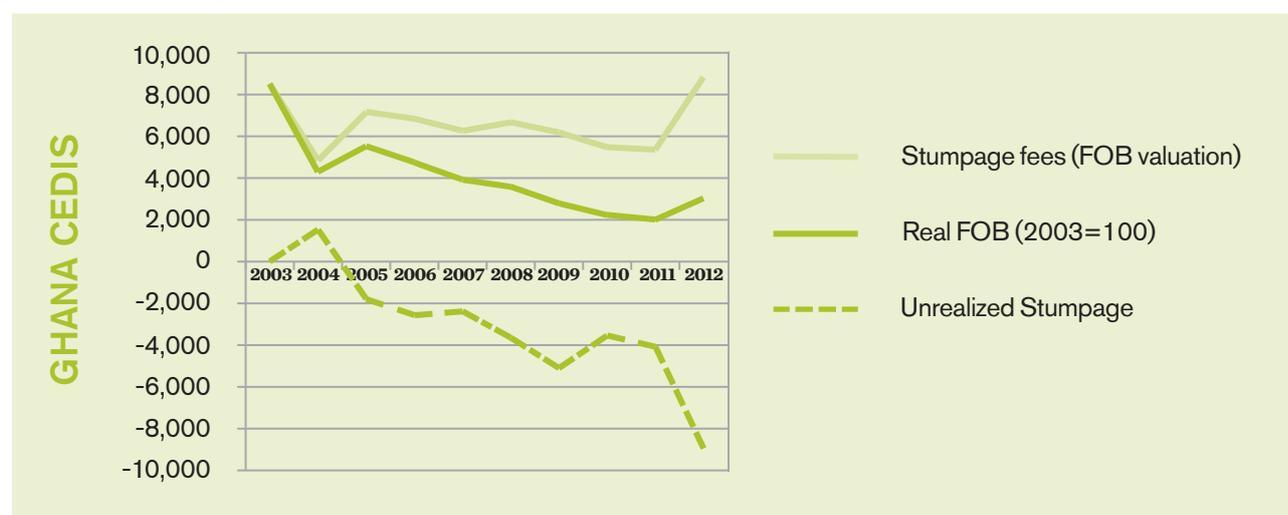
	PERIOD	ANNUAL
Nominal stumpage fees	61,044	6,104
Stumpage fees (FOB related), current	66,115	6,611
Stumpage fees (FOB related), real 2003 pricing	40,651	4,065
Loss due to non-application of FOB pricing	5071	507
Loss due to unadjusted FOB for inflation	25,464	2,546
Total loss	30,535	3,053

Source: Appendix 6

increase in value even though sometimes the FOB (Euro) price dropped (Appendix 5). This is the effect of the official exchange rate adjustment. Where inflation is not taken into account over the trend period, stumpage would lose value. In practice, over the period, none of the adjustments – FOB adjustment by legislation or inflation indexing by governance reforms – took place. In the research methodology, the history of assumed FOB-linked values of stumpage have been used as a base and the corresponding rates of annual inflation used to estimate the real value of stumpage in the particular year (Appendix 5). On the basis of this methodology, two types of drivers of stumpage loss and their financial impacts were estimated. The first driver is the failure by FC to comply with legislation on the use of FOB as a reference price. The second is the absence of a sector policy to adopt indexing of FOB-linked stumpage fees to inflation. Over the period, resource owners lost on the average about GH₵ 560,000 (US\$ 300,000) on the basis of non-legal compliance (FOB adjustment) and about GH₵ 2.8 million (US\$ 1.5 million) annually – five times the ‘current’ FOB scenario – for not pursuing simultaneously legal compliance and further governance reforms. The overall impact is an annual average stumpage loss of about GH₵ 3.4 million or close to US\$ 2 million over the period (Table 2).

Thus, over the period, forest owners have lost the opportunity to collect about GH₵ 30 million (US\$ 16 million) from the timber industry – or close to four times its potential industry contribution to social responsibility agreements (SRAs). This is because the annual potential loss was allowed to increase progressively over the period – resulting in significant losses (Figure 2).

Figure 2. Real loss in stumpage value



Source: Appendix 6

Discussion and ways forward



4.1 Policy issues

It is immediately observed from the stumpage loss analysis that FOB adjustment alone is not enough to protect the real value of stumpage. Further, it is the least effective approach to maintain stumpage value when compared to inflation indexing.

In attempting to answer why FC has not adjusted stumpage fees for close to a decade, one should look for answers outside the period of research. In as early as 2001, it had been established that the sector suffered from policy failure. Failure to adjust stumpage fees in the period 1990–99 produced results similar to those described here in the subsequent decade. Commitments of the FC board in the 2000s did not include adjusting stumpage fees to their real levels. Strong industry sentiments on the board perhaps made it easy to confuse symptoms with real underlying or root causes. There was the persistent argument that industry was not making a profit because of high costs and that it needed high volumes of timber to break even. So increasing stumpage fees was out of the question. But in the forest fiscal context that pushed for appropriate timber pricing to create incentives for sustainable forest-use practices, the industry argument rather propagated the ‘problem’ and not the ‘solution.’ While a person sick with malaria needs to take the bitter quinine to be cured, they should not take it after getting better.

Regarding stumpage rates, in general the FC has not taken advantage of its mandate to promote the industry by using its market intelligence and RMSC’s management-of-species inventory data to move species up the graduated scale of stumpage rates, in consultation with the Administrator of Stool Lands, as implied under LI 1649.

To understand the implications of non-renewal of stumpage fees – and how advocacy can address these implications – it is necessary to put the current policy of stumpage depreciation in the context of political decision making. Historically, stumpage fees have been the orthodox approach to taxing commercial forest exploitation. Leakage in stumpage fees had been observed in the early 1980s and recommendations to plug the leakage have included e.g. a shift from a unit volume-based to fixed tree volume-based calculation (World Bank, 1986). These recommendations did not work. Preparations for the forest management project proposed competitive bidding to be adopted in allocating timber resources. The follow-up legislation, the Timber Resources Management Act or Act 547 in 1997 fell short of specifying competitive ‘bidding’, by providing for competitive ‘procedures’.

Political decisions have always been influenced by the consideration that price reforms will cause unemployment in the timber industry. But there was enough evidence to suggest that the level of employment generated by the

industry was based on the unsustainable use of forest resources (Birikorang *et al.* 2001). Failure to reform timber pricing has resulted in continued over-harvesting and the creation of timber scarcity, a massive ‘crunch’ caused by unplanned industry capacity and unemployment in the mid-2000s. An important adverse economic impact of these political decisions has been the compulsion of the state to rely on its budgetary resources to create employment and provide social livelihoods, not to mention the cost of social instability among Ghanaian society. Under the option of price reform, the same unemployment would still have occurred. The difference between this option and the political decision in favour of business as usual is that the reform option would have generated opportunities to finance the cost of social adjustment from the industry’s own pocket – and not the state budget. So the option of reforming pricing policy is always a less costly one.

Stumpage fees contribute significantly to the FC’s budget. The medium-term expenditure framework (MTEF) of the Ministry of Finance and Economic Planning (MoFEP) allocates budgets to sector ministries which in turn re-allocate funds in accordance with their priorities and overall political direction. So to a large extent, the FC becomes vulnerable to circumstances of unrealised or depreciating stumpage values. Studies in the mid-1990s emphasised that sustainable forest management required varied forms of incentive systems to be effective. In addition to a forest fee system that resourced the state and adequately rewarded timber operators, it was necessary also to equitably reward and actively engage forest communities to participate in forest protection and improvement systems (Mayers, *et al.* 1994). The FAO also acknowledged in the late 1990s the strategic importance of the Forest Services Division (FSD) of the Forestry Commission that had in the mid-1990s embarked upon a number of approaches including programmes such as collaborative forestry and social responsibility systems to accomplish forest community engagement, and concluded that ‘without bringing in the rural people on whose land the forest grows, any effort to significantly improve the forest will not succeed’ (FAO 1997). This notwithstanding, FSD’s budget releases between 2005 and 2011 was less than 25 per cent of its financial plan. In 2005, FSD’s administration and services expenditure amounted to US\$ 3.1 million (Birikorang *et al.* 2007). In 2006, it planned but realised far less than a budget of US\$ 8.5million (Essiam, M., 2013). In comparison with this budget, it received a total of US\$ 2.3 million in 2010 and for the first three quarters of 2011 a total budget of US\$ 667,000 (*Ibid.*). Thus, FSD has not been adequately resourced to achieve results in line with the global appreciation of its strategic importance. While this has affected quality forest-management services and environmental protection, depreciating stumpage has led to forest communities becoming frustrated by under payment.

It is also observed that the Natural Resources and Environmental Governance Project (NREG), the Ghana government's multi-donor dialogue platform governing the performance assessment framework of the forest sector also failed to encourage policy making affecting stumpage fees. The FC relied in the 2000s on stumpage fees (and in later years on competitive bidding resources) for more than 60 per cent of its budget. But policy triggers, defining specific policy actions to be completed by targeted periods, were progressively waived annually to enable MoFEP to access budget support funds. At the same time, a lack of understanding of how FC's finances worked caused MoFEP to restrict budget releases to the FC. So while the political commitment to maintain an appropriate timber pricing structure was lacking, NREG also failed to push for forest fiscal reforms in this respect.

4.2 Potential risks for conflicting revenue and environmental objectives

In line with expectations of an assessment of the impact of VPA, the annually recorded harvest volumes of traditional species have considerably reduced (Mayers et al. 2008), thus contributing significantly to the decline in annual stumpage values. High-demand species comprising of traditional (primary) species accounted for less than 10 per cent of annual harvests, but 29 per cent of stumpage value over the research period (Figures 3 and 4). The high proportion of moderate- and low-demand species is very conspicuous.

Since September 2006, TIDD's export levies have been reduced from 3 per cent to 1.5 per cent, with one-third of the levies collected (0.5 per cent) committed to an escrow account for the financing of forest plantations. TIDD's revenue, consolidated in FC's corporate receipts,

has been reduced from about GH¢ 6000 annually to GH¢ 3000, while stumpage fees linger at around GH¢ 9000. Given the increased reliance on stumpage fees, there is the risk that FC's financial distress might translate into using forest planning to increase its revenue by allocating more high stumpage-rated traditional species to the yields of timber utilisation contract (TUC) holders than is 'allowable'. There is, therefore, the risk that a persistent loss of real stumpage value could compel FC to include more expensive and scarce timber species in the annual allowable cut (AAC), given FC's trial role of forest planner, revenue manager and forest-performance monitor.

4.3 Risk of revenue loss through timber laundering

Studies in timber regulations in the 2000s established a significant discrepancy between the species recorded at the harvest level and those captured at the export end (Hansen et al. 2007). Laundering of timber species to avoid paying the appropriate stumpage fees is a risk to securing future stumpage revenues, as well as compliance with environmental and ecological prescriptions of the FC. RMSC manages and controls forest inventory data to support forest planning at the forest management unit level and to regulate the annual harvest plans of TUC holders. The inventory-data management is largely based on analogue rather than digital (electronic) data. This is a weakness, as analogue data are tamper-prone. There is therefore a pressing need to build RMSC's capacity to develop and manage digitised forest-inventory data in order to overcome the challenges posed by potential timber laundering. This is important to the legality assurance system (LAS). Until this is achieved, both the state, FC and forest owners remain exposed to the risk of timber laundering.

Figure 3. Shares of categories of species in average of 2003–12 harvest volume

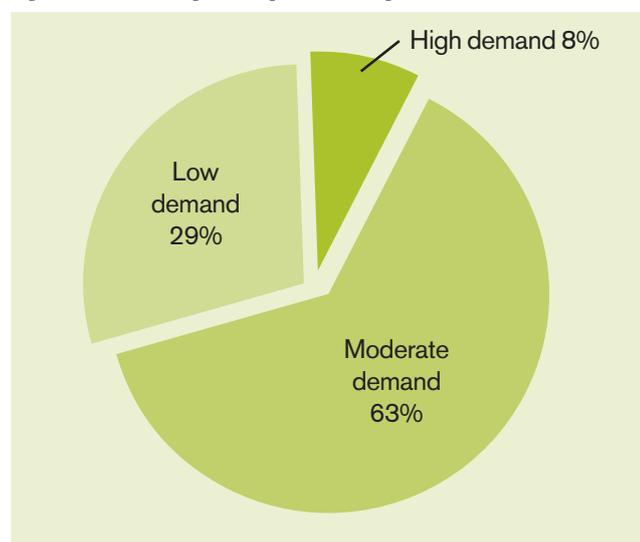
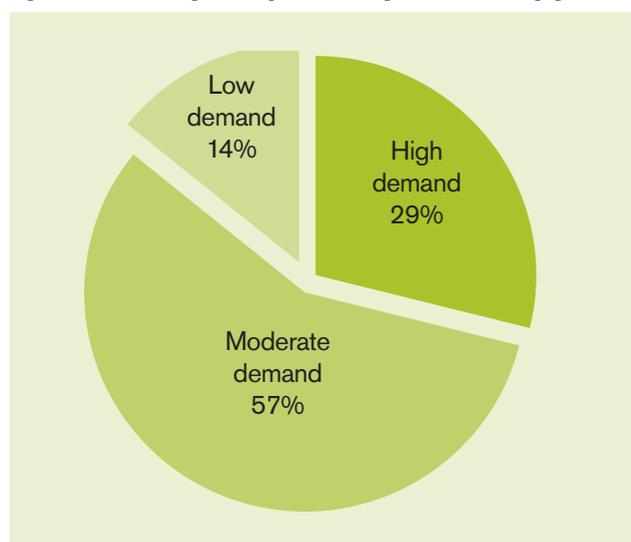


Figure 4. Shares of categories of species in average of 2003–12 stumpage value



4.4 Timber industry performance and development indicators: knowledge gaps

No comprehensive research into the financial and economic aspects of industry and their related policy diagnosis has been done since the wood industry and log export ban study in 2001 (Birikorang et al. 2001). The wood industry is observed to have undergone a greater degree of consolidation. Some structural changes are also suggested by changes in the current composition of exports, namely relatively less ADL and more plywood and other timber products. The absence of an updated technical and financial audit of the industry has created technical data and knowledge gaps on industry characteristics and behaviour, posing a challenge to TIDD that must advise on a future review of the structure of timber pricing as provided in Regulation 22 (2) (see Box 1). Presently, TIDD is a step behind, instead of being a step ahead of industry. It should be able to assume leadership in diagnosing changes in industry development and behaviour, draw technical and economic implications from them, and cause policy to direct industry development and integration, particularly in development of the domestic market. The possible exercise of executive powers to change stumpage fees

faces a potential constraint in the form of an abandoned strategic role of TIDD necessary to build alliances with inter-related public institutions and the PSCLF. Changing the rate of FOB values assigned as timber prices is the only factor that can be excluded from the use of an executive instrument by MLNR. As explained earlier, adjustments in the rate of FOB values will require parliamentary approval. In the long term, this may not be necessary, but it will largely depend on how TIDD takes control of the management of the industry's development path.

Generally, the use of an executive instrument is subject to the existence of regularly informed forest stakeholders. It is observed that not much of TIDD's market intelligence is disseminated, and none in the case of economic intelligence, to inform the executive and legislature. One of the key strategies in 1985 of establishing the Timber Export Development Board (TEDB) and Forest Products Inspection Bureau (FPIB) out of one organisation, the erstwhile Ghana Timber Marketing Board was to create a separate institution, with TEDB to provide, among its functions, economic intelligence to the MoFEP, while the FPIB was allocated the function of approving export prices. These separate institutions now comprise the TIDD. Resumption of the economic intelligence and dissemination of its current market intelligence reports could facilitate a smooth adoption of EIs in making current stumpage values responsive.

Recommendations

5

5.1 Managing a fiscal transition under VPA

On a number of occasions, policy decisions have been conducted in a rush without adequate consultation and backing from an analytical framework that best informs policy. A case in point is the institution of social responsibility agreements (SRAs), which evolved simply by the attractive convenience of industry being directed to pay an additional 5 per cent of stumpage fees. In the view of the current research SRAs have been a failure. Communities in districts with depleted forests receive insignificant sums of money while the key issue of debating transparency in the use of district assemblies' dominant share of stumpage fees remain. In addition, experiences of competitive bidding for plantation timber resources have shown that some landowners have hijacked the concept of SRAs and claimed control of them.

It is observed in this research that provisions under regulations alone are not enough to fully recover real loss in stumpage value. The reader will appreciate at this point that even a bad policy is still circumscribed by law. So any discussion of policy gaps beyond what is achievable under legislation must happen outside the VPA, unless the policy specifics are defined under the government of Ghana's commitment to governance as provided under Section 5 of Annex II of the VPA. For these reasons, recommendations made in the section on policy issues (Section 4.1) are structured to permit exploration of short- to medium-term opportunities for MLNR and the NREG to work out and implement a timber price reform outside the VPA agreement that restores the real stumpage level. In the medium to long term, MLNR will concern itself with a fiscal transition to long-term implementation of the VPA. It is expected that this approach will influence a clear definition of the government of Ghana's commitment to governance under Section 5 of Annex II of the VPA.

5.2 Specific recommendations

Specific recommendations are also made on key issues that need to be included in a consultative process for managing the fiscal transition under the VPA. In the short term:

- The FC should begin to implement quarterly reviews of stumpage fees indexed to both the FOB value of ADL and the quarterly average rate of inflation.
- MLNR and FC should together develop a short- to medium-term forest fiscal strategy. Using the dialogue platform with the technical committee of NREG, they should seek to have this strategy and its financial plan incorporated in MoFEP's medium-term expenditure

framework (MTEF). While the short-term reforms will improve forest communities' incentives to protect trees, incorporating the forest fiscal and financial plan in MoFEP's MTEF will improve dialogue concerning MoFEP providing adequate funding for FC to meet its forest environmental management goals.

- MLNR should recognise CSOs as FC's partners in policy implementation and provide support for building their capacity. This should strengthen CSO responsiveness to VPA protocols relating to the Verification of Legal Compliance (VLC) and Verification of Legal Origin (VLO) under Ghana's VPA with the EU.

In the medium term:

- FC should actively engage CSOs to participate in monitoring the supply chain of timber as this will be regulated under the Legality Assurance Scheme.
- FC should pursue a priority agenda for RMSC capacity building to ensure the credible traceability of timber volume and value.

In the long term, MLNR should take the lead in pursuing a long-term vision of reaching an MLNR/MoFEP/FC tripartite memorandum of understanding on managing a long-term forest fiscal strategy under which MLNR manages forest fiscal policy through executive rather than legislative instruments. This MoU must be endorsed by the Cabinet.

Managing the strategy will require TIDD to be adequately resourced to update knowledge on industry performance and development. It must also institutionalise industry consultation to support MLNR's application of executive instruments. The long-term challenges facing TIDD include continuing to review the 35 per cent timber price and both the current stumpage rates and the market ratings of species to support both industry growth and employment generation.

References

Essiam, M., Finance Manager, Forest Services Division. Personal communication. 2013.

Birikorang, G., Okai, R., Asenso-Okyere, K., Afrane, S. and Robinson, G. (2001). Ghana Wood Industry and Log Export Ban Study. Forestry Commission report to the Ministry of Lands and Forestry. Forestry Commission, Accra, Ghana.

Corporate Planning Unit, Forestry Commission, Current stumpage rates, 2013

Essiam, M., Finance Manager, Forest Services Division. Personal Communication, 2013.

Government of Ghana. (1998). Timber Resources Management Regulation 1998, LI 1649. <http://faolex.fao.org/docs/pdf/gha68466.pdf>

Hansen, C. P., and Treue, T., *Illegal Logging In Ghana*. Policy Brief, No. 5, December, 2008; FOREST LANDSCAPE

Mayers, J., Howard, C., Kotey, E. N. A., Prah, E., Richards, M. (1994). *Incentives for the Sustainable Management of the Tropical High Forest in Ghana*. IIED, London, UK. <http://pubs.iied.org/7510IIED>

Mayers, J., Birikorang, G., Danso, E.Y., Nketiah, K.S. and Richards, M. (2008). *Assessment of Potential Impacts in Ghana of a Voluntary Partnership Agreement with the EC on Forest Governance*. Forestry Commission, Government of Ghana and IIED, London. <http://pubs.iied.org/G02594.html>

U.N. FAO *Update On Sustainable Forest Management and Certification: Example From A Developing Country – Ghana* 38th Session of Advisory Committee On Paper And Wood Products. Rome, 23-25 April, 1997

World Bank (1986). Ghana Forest Sector Review

Appendix 1.

Terms of reference

Terms of reference to determine the financial loss to landowners and the state due to the non-review of quarterly stumpage fees since 2005.

Background

According to Schedule 3 of the Timber Resources Management Regulation LI 1649 (Government of Ghana 1998), "Timber price is 35 per cent of the free-on-board (FOB) value of air-dried lumber of the species (i.e. estimated roundwood equivalent), based on the previous quarter's average of such exports as published from time to time by the Forest Products Inspection Bureau." The FC has not, by implication of a mandatory quarterly review, complied with regulations since 2004. This implies a loss of revenue to the state.

There are widespread controversies surrounding the girth limits of felled trees for individual tree species and by implication the legitimacy of the conduct of inspection by the regulatory institution. Resource scarcity poses a risk of extraction of trees below their minimum girth. This is a challenge for timber legality under the VPA. Furthermore, civil society is interested in how the sustainability of various endemic species can be guaranteed. A long-term policy that links markets to silvicultural practices and determination of the annual allowable cut needs to be implemented alongside the VPA. The implications for future revenues and how they extend the trajectory of future stumpage levels should also be appreciated.

Civil society is interested in assessing the impacts of value loss due to the non-review of stumpage compounded with the long-term effects of resource depletion, and seeks to conduct a two-phase study to examine these impacts.

The broad objective of this first phase consultancy is to seek to protect the interest of the state and forest owners in forest tax imposition and appropriation. According to LI 1649 21(2), stumpage fees represent royalties to the landowner and charges for the cost of felled timber which provide a basic return to the landowner and contribute to the cost of forest management and timber regulation. The immediate objective of the consultancy is therefore to discover what has been lost in potential revenue to the state and resource owners from the non-review of stumpage.

Scope of work

The consultant will conduct a study to:

- Project the extent of lost revenue to the state from 2003 to 2012
- Examine the underlying reasons for the failure to review stumpage
- Examine the legal, political and policy implications of this non-review for forest resources management and the Voluntary Partnership Agreement, and
- Make recommendations for a VPA verification protocol to ensure that the law is being enforced.

Deliverables

The consultant will produce the following documents for Civic Response:

- A report detailing the loss of revenue year by year, due to the non-review of the stumpage fees policy and its implications
- A PowerPoint presentation of findings, to be made to forest stakeholders, and
- A four-page policy brief for dissemination to:
 - State institutions and agencies (Parliament, Ministry of Lands and Natural Resources, Forestry Commission), and
 - Civil society, communities and resource owners.

Appendix 2. Stumpage rates (market classifications)*

TRADE NAME	LOCAL NAME	BOTANICAL NAME	STUMPAGE RATE
High demand	Depleted species	Class 1	20%
African Walnut	Dubini-Biri	Lovoa trichilioides	
Afrormosia	Kokrodua	Pericopsis elata	
Aningeria	Asanfin	Aningeria altissima/robusta	
Black Hyedua	Hyeduanini	Guibourtia ehie	
Candollei	Penkwa-Akoa/Omu	Entandrophragma candollei	
Iroko	Odum	Milicia excelsa/regia	
Mahogany	Krumben/Odupon/Dubin	Khaya spp.	
Makore	Baku/Makore	Tieghemella heckelii	
Opepe	Kusia	Nauclea diderrichii	
Sapele	Penkwa	Entandrophragma cylindricum	
Utile	Efuobrodedwo	Entandrophragma utile	
Moderate demand	Available species	Class 2	10%
Afara	Ofram	Terminalia superba	
Afzelia	Papao	Afzelia africana/bella	
Albizia	Awiemfo Samina/Okoro	Albizia ferruginea	
Ayan	Bonsandua	Distemonanthus benthamianus	
Avodire	Apapaye	Turreanthus africanus	
Bombax	Onyina-Koben	Rhodognaphalon brevicuspe	
Canarium	Bediwonua	Canarium schweinfurthii	
Ceiba	Onyina	Ceiba pentandra	
Ekki	Kaku	Lophira alata	
Gedu-Nohor	Edinam	Entandrophragma angolense	
Idigbo	Emeri	Terminalia ivorensis	
Mansonia	Opron	Mansonia altissima	
Obeche	Wawa	Triplochiton scleroxylon	
Ogea/Daniella	Shedua	Daniella ogea/thurifera	
Pterygota	Kyere/Koto	Pterygota macrocarpa	
Antrocaryon	Aprokuma	Antrocaryon micraaster	
Guarea	Kwabohoro/Kwadwuma	Guarea spp.	
Longhi (Blanc)	Akasa	Chrysophyllum albidum	
Niangon	Nyankom	Heritiera utilis	

* Reference: Timber Resources Management Regulations, L.I., 1649, Schedule 2, Regulation 2(1) (Government of Ghana, 1998).

TRADE NAME	LOCAL NAME	BOTANICAL NAME	STUMPAGE RATE
Low demand	Abundant species	Class 3	5%
Celtis	Esa	Celtis mildbraedii/zenkeri	
Danta	Danta	Neosogordonia papaverifa	
Homba	Otie	Pycnanthus angolensis	
Missanda	Potrodum	Erythronphleum guineense	
Okan	Denya	Cylicodiscus gabunensis	
Sterculia	Wawabim	Sterculia rhinopetala	
Wonton	Wonton	Morus mesozygia	
Antiaris	Chenchen	Antiaris Africana	
Dahoma	Dahoma	Piptadeniastrum africanum	
Other species			

Appendix 3. Annual stumpage fee levels by timber species

SPECIES	CURRENT STUMPAGE RATES								
	¢/m ³ Q1/2011	¢/m ³ 2010	¢/m ³ 2009	¢/m ³ 2008	¢/m ³ 2007	¢/m ³ 2006	¢/m ³ 2005	¢/m ³ 2004	¢/m ³ 2003
High demand									
Asanfena	25.20	25.20	25.20	25.20	25.20	25.20	25.20	25.20	25.20
Utile	31.60	31.60	31.60	31.60	31.60	31.60	31.60	31.60	31.60
Candollei	21.69	21.69	21.69	21.69	21.69	21.69	21.69	21.69	21.69
Hyeduanini	33.03	33.03	33.03	33.03	33.03	33.03	33.03	33.03	33.03
Mahogany	24.28	24.28	24.28	24.28	24.28	24.28	24.28	24.28	24.28
Odum	25.17	25.17	25.17	25.17	25.17	25.17	25.17	25.17	25.17
Kusia	18.03	18.03	18.03	18.03	18.03	18.03	18.03	18.03	18.03
Makore	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72
Sapele	27.37	27.37	27.37	27.37	27.37	27.37	27.37	27.37	27.37
Walnut	22.61	22.61	22.61	22.61	22.61	22.61	22.61	22.61	22.61
Afromosia	50.87	50.87	50.87	50.87	50.87	50.87	50.87	50.87	50.87
Moderate demand									
Papao	11.96	11.96	11.96	11.96	11.96	11.96	11.96	11.96	11.96
Awiefosamina	6.38	6.38	6.38	6.38	6.38	6.38	6.38	6.38	6.38
Aprokuma	6.38	6.38	6.38	6.38	6.38	6.38	6.38	6.38	6.38
Bediwenua/Canarium	6.38	6.38	6.38	6.38	6.38	6.38	6.38	6.38	6.38
Onyina	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78
Akasa	10.36	10.36	10.36	10.36	10.36	10.36	10.36	10.36	10.36
Shedua	6.54	6.54	6.54	6.54	6.54	6.54	6.54	6.54	6.54
Ayan/Bonsamdua	10.32	10.32	10.32	10.32	10.32	10.32	10.32	10.32	10.32
Edinam	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24
Guarea	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57
Nyiangon	12.44	12.44	12.44	12.44	12.44	12.44	12.44	12.44	12.44
Kaku	8.77	8.77	8.77	8.77	8.77	8.77	8.77	8.77	8.77
Mansonia	11.96	11.96	11.96	11.96	11.96	11.96	11.96	11.96	11.96
Koto/Kyere	12.64	12.64	12.64	12.64	12.64	12.64	12.64	12.64	12.64
Onyinakoben/Bombax	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78
Emire	10.68	10.68	10.68	10.68	10.68	10.68	10.68	10.68	10.68
Ofram	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95
Wawa	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18
Rosewood/Kpatro									
Avodire	10.65	10.65	10.65	10.65	10.65	10.65	10.65	10.65	10.65

SPECIES	CURRENT STUMPAGE RATES								
	¢/m ³ Q1/2011	¢/m ³ 2010	¢/m ³ 2009	¢/m ³ 2008	¢/m ³ 2007	¢/m ³ 2006	¢/m ³ 2005	¢/m ³ 2004	¢/m ³ 2003
Low Demand									
Essa	3.19	3.19	3.19	3.19	3.19	3.19	3.19	3.19	3.19
Danta	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62
Otie	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42
Potrodom	3.59	3.59	3.59	3.59	3.59	3.59	3.59	3.59	3.59
Denya	4.39	4.39	4.39	4.39	4.39	4.39	4.39	4.39	4.39
Wawabima	3.59	3.59	3.59	3.59	3.59	3.59	3.59	3.59	3.59
Wonton	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39
Chenchen	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15
Dahoma	3.59	3.59	3.59	3.59	3.59	3.59	3.59	3.59	3.59
Others	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39

Source: Corporate Planning Unit, Forestry Commission

Appendix 4. Formula for calculating stumpage fees

Schedule 3, Regulation 22(2): Formula for calculating stumpage fee

Stumpage Fee = Tree Volume x Timber Price x Stumpage Rate

Where Tree Volume is computed in cubic metres according to the measurements taken of each tree felled, using Smalian's Formula as follows:

$$V = kL [(db1 + db2)^2 + (dt1 + dt2)^2]$$

where V = the volume of the log

K = the constant 0.098

L = the length of the log

db1,db2 = the first and second diameters at the base end, measured at right angles to each other

dt1,dt2 = the first and second diameters at the top end, measured at right angles to each other

Timber price is 35 per cent of the free-on-board (FOB) value of air-dried lumber of the species (i.e. estimated roundwood equivalent), based on the previous quarter's average of such exports as published from time to time by the Forest Products Inspection Bureau.

The stumpage rate for each timber species is the percentage specified in Schedule 3 of these Regulations.

Appendix 5.

Restricted species

Schedule 6, Regulation 40(1)

Restricted timber species

LOCAL NAME	TRADE NAME	BOTANICAL NAME
Edinam	Gedu-Nohor	Entandrophragma angolense
Penkwa	Sapele	E. cylindricum
Efuobrodedwo	Utile	E. utile
Penkwa-Akoa/Omu	Candollei	E. candollei
Krumben	Mahogany	Khaya anthotheca/grandifolia
Dubini	Mahogany	K. ivorensis
Odum	Iroko	Milicia excelsa/regia
Kusia	Opepe	Nauclea diderrichii
Baku	Makore	Tieghemella heckelii
Hyedua	Black Hyedua	Guibourtia ehie
Kokrodua	Afrormosia	Pericopsis elata

CLETUS A. AVOKA

Minister for Lands and Forestry

Date of Gazette notification: 10th November 1998.

Entry into force: 16th December 1998.

Appendix 6. Economic analysis of stumpage loss, 2003–12

A. ANALYSIS										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1 ADL, FOB Value, US\$/m ³	410	399	396	410	418	400	427	440	485	628
2 Foreign exchange rate (GH¢/US\$)	1.24	0.89	0.92	0.96	0.95	1.08	1.40	1.43	1.51	1.81
3 ADL, FOB Value, GH¢/m ³	509	356	364	392	395	432	596	630	730	1136

B. RESULTS (GH¢ THOUSANDS)										TOTAL	
A Stumpage fees nominal	8,510	6,918	7,003	6,352	6,208	6,096	4,476	5,178	4,623	5,680	61,044
B Stumpage fees analysed, FOB only	8,510	4,846	7,161	6,830	6,256	6,664	6,183	5,474	5,355	8,835	66,115
C Real FOB, in 2003 domestic prices (2003=base year)	8,510	4,298	5,519	4,744	3,925	3,590	2,792	2,231	2,007	3,034	40,651
D Loss on FOB (B-C)	0	548	1,642	2,086	2,331	3,074	3,391	3,243	3,348	5,801	25,464
E Loss on nominal stumpage (unadjusted FOB)	0	-2,072	158	478	48	568	1,707	296	732	3,156	5,071
Unrealised stumpage (D+E)	0	1,524	-1,800	-2,564	-2,380	-3,642	-5,098	-3,539	-4,079	-8,956	-30,535

SUMMARY		
	Period	Annual
Loss due to non-application of FOB pricing	5,071	563
Loss due to unadjusted FOB for inflation	25,464	2,829
Total loss	30,535	3,393

Stumpage fees due from the timber industry are a key component of forest communities' welfare and contribute to the cost of forest management and timber regulation. Yet, as the research presented in this report shows, the Forest Commission's failure to review stumpage in Ghana has led to millions of dollars of lost revenue from stumpage fees over the period 2003-2012. The report outlines the underlying reasons for this noncompliance, the implications of non-review for forest resources management and makes recommendations to address shortcomings and inform future policy actions to protect the interests of the state and forest owners in forest tax imposition.

IIED is a policy and action research organisation. We promote sustainable development to improve livelihoods and protect the environments on which these livelihoods are built. We specialise in linking local priorities to global challenges. IIED is based in London and works in Africa, Asia, Latin America, the Middle East and the Pacific, with some of the world's most vulnerable people. We work with them to strengthen their voice in the decision-making arenas that affect them — from village councils to international conventions.



International Institute for Environment and Development
80-86 Gray's Inn Road, London WC1X 8NH, UK
Tel: +44 (0)20 3463 7399
Fax: +44 (0)20 3514 9055
email: info@iied.org
www.iied.org



This research was part-funded by UK aid from the UK Government, however the views expressed do not necessarily reflect the views of the UK Government. This document has been produced with the financial assistance of the European Union. The contents of this document are the sole responsibility of IIED and can under no circumstances be regarded as reflecting the position of the European Union.



Knowledge
Products