

Assessment of Potential Impacts in Ghana of a Voluntary Partnership Agreement with the EC on Forest Governance



Final Report

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Executive summary

This report describes the context, objectives, approach and findings of an independent assessment of the possible impacts in Ghana of key options for a Voluntary Partnership Agreement between Ghana and the European Union on forest governance. The International Institute for Environment and Development steered the team carrying out this work from September 2007 to March 2008.

The team developed three main scenarios in the development of the forest sector in Ghana:

- ❑ *Baseline* scenario - current situation projected into the future
- ❑ *Legitimate timber* scenario - legality assurance for export and domestic markets
- ❑ *Sector reform* scenario – transition to improved forest governance

Assessment of the potential impacts of policy measures within these scenarios was attempted for three main points in time – taking stock of the present, and projecting to the years 2012, and 2020.

Information accessed, developed and analysed derived from four main sources:

- ❑ Some 95 key references and other recorded information sources reviewed
- ❑ About 110 resource people and stakeholders interviewed - some repeatedly engaged with
- ❑ Modelling of industry, institutional and economic data, generally from 2005 as the base year
- ❑ A survey of 164 primary stakeholders in informal enterprise, labour and forest communities

In this report the team lays out its main assumptions made in the work. However, the assessments made cannot be regarded as empirically robust and should be treated with caution.

A preliminary estimate of the possible revenue from a national Reduced Emissions from Deforestation and forest Degradation strategy was undertaken since this is an emerging field which could significantly affect sector strategy in Ghana. Importation of round wood, plantation development and logging of submerged timber from Lake Volta are other emerging trends about which significant uncertainty currently prevails and further analysis would be useful.

The following table summarises gains and losses for Ghana by 2020

	Gains	Losses
Without a legitimate timber regime attempted	<ul style="list-style-type: none"> ❑ Short term profit for some existing industry ❑ Short term benefits for some from chainsaw lumbering ❑ Short-term employment benefits in forest industry 	<ul style="list-style-type: none"> ❑ 'Hard landing' as sector dwindles fast, corruption rife ❑ Resource crash, deforestation and degraded ecosystem services: foregone carbon payments; soil erosion and water quality problems; and loss of biodiversity ❑ Marginalised communities, rampant illegality, conflict and local governance problems
With an effective legitimate timber regime	<ul style="list-style-type: none"> ❑ 'Softer landing' for a downsized sector ❑ Improved formal sector resource management ❑ Increased accountability stimulates positive engagement 	<ul style="list-style-type: none"> ❑ Lower revenues, continued social / environmental risk ❑ Some species loss and forest degradation ❑ Communities still disenfranchised and some social dislocation ❑ Substantial numbers of companies dissolved with employment losses
With sector reform	<ul style="list-style-type: none"> ❑ Stabilised productive forest sector, healthy revenues ❑ Responsible management on and off reserve with maintenance of ecosystem services resulting in carbon storage, watershed and biodiversity protection ❑ Rights, responsibilities and capacity in the best places for good management and local benefit ❑ Larger share of 'timber economic rent' to resource owners 	<ul style="list-style-type: none"> ❑ Smaller forest sector ❑ Still lower levels of forest goods and services (may regenerate / expand beyond 2020) ❑ Lower (but sustainable) employment levels ❑ Despite gains – it is too little and too late for some communities

The team concluded that pursuing a VPA will be neither an easy ride nor an easy answer to the problems of Ghana's forests:

- ❑ With a legitimate timber regime developed through a VPA process Ghana is better off than without one
- ❑ Domestic and export markets are interdependent, so measures to address both must be pursued concertedly, creatively and simultaneously - and can be phased
- ❑ A legitimate timber regime will make Ghana more able to bring about forest sector reform – it is an important stepping stone
- ❑ But even with a legitimate timber regime: the forest resource will be substantially degraded, forest industry will make a smaller contributor to the economy and communities will remain with no interest in forest management – a VPA is not enough
- ❑ A VPA process should ensure that it stimulates and supports further bold measures towards good forest governance – for improved sustainability and livelihoods

Recommendations:

Upon signing a VPA we recommend that the following policy measures are initiated, with pilot programmes developed, then workable systems rolled out:

1. Legal standard
2. Chain of custody system
3. Verification of legality system
4. Increased stumpage fees, competitive bidding and effective revenue collection
5. Penalties updated and justice system upgraded
6. Public disclosure
7. Awareness campaign
8. Facilitated stakeholder engagement
9. Capacity building (for above policy measures)

Within two years we recommend that the following policy measures are initiated, with pilot programmes developed, then workable systems rolled out:

10. Independent monitoring
11. Regularised chainsaw/mobile mill groups within districts
12. Off-reserve enumeration, allocations and spot checks
13. Collaboration with export market monitoring
14. Public procurement policy
15. Mitigation of some key negative impacts
16. Catalysed industry capacity reduction
17. Incentives for downstream processing
18. From forest benefits to forest rights - including farmer tree tenure
19. Stakeholder decision-making

Within four years we recommend that the following policy measures are initiated, with pilot programmes developed, then workable systems rolled out:

20. Domestic market monitoring
21. Enabling framework for investment in plantations
22. Facilitated investment in small enterprise
23. Regional cooperation
24. Capacity building (for above policy measures)

The VPA process represents an opportunity to move forward with reforms in the forest sector in Ghana that have been pressing for many years – and should be grasped. It is strongly recommended that the Government of Ghana and the EC reach an agreement which explicitly combines high-level political commitment, careful phasing, substantial resources and practical institutional capability to put Ghana on the road to good forest governance.

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Acronyms

AAC	Annual Allowable Cut
CEPS	Customs Excise & Preventive Services
CIF	Cost Insurance Freight
CLC	Certificate of Legal Origin
CLO	Certificate of Legal Compliance
EC	European Commission
EU	European Union
FC	Forestry Commission
FLEGT	Forest Law Enforcement Governance and Trade
FMU	Forest Management Unit
FR	Forest Reserve
FSD	Forest Services Division
GDP	Gross Domestic Product
Gt	Gigatonne
GTA	Ghana Timber Association
Ha	Hectare
IIED	International Institute for Environment and Development
LAS	Legality Assurance System
LI	Legislative Instrument
LIC	Lumber Inspection Certificate
LIF	Log Information Form
LMCC	Log Measurement and Conveyance Certificate
m ³	cubic metre
MLFM	Ministry of Lands, Forestry and Mines
NPV	Net Present Value
NTFP	Non-timber forest product
OASL	Office of the Administrator of Stool Lands
OFR	Off Forest Reserve
REDD	Reduced Emissions from Deforestation and Degradation
RMSC	Resource Management Support Centre
RMT	Recovery Mobile Teams
RWE	Round Wood Equivalent
SFM	Sustainable Forest Management
SRA	Social Responsibility Agreement
tCO ₂ e	Tonnes of carbon dioxide equivalent
TIDD	Timber Industry Development Division
TIF	Tree Information Form
ToR	Terms of Reference
TRF	Timber Rights Fees
TUC	Timber Utilisation Contract
TUP	Timber Utilisation Permit
TVE	Timber Validation Entity
UNFCCC	United Nations Framework Convention for Climate Change
US\$	United States Dollars
VAT	Value Added Tax
VPA	Voluntary Partnership Agreement
VLTP	Validation of Legal Timber Programme
VLSWG	Verification System and Licensing Scheme Working Group
WTS	Wood Tracking System

Currency conversion rate used

1 US\$ = 0.96 Ghana Cedis

1. Rationale for this work

1.1 An agreement between Ghana and the EC on forest governance

The Government of Ghana has entered into negotiations with the European Union (EU) for a Voluntary Partnership Agreement (VPA) to govern trade in timber between the two parties. Under the VPA, legally produced timber exported to the EU would be identified by means of a license issued in Ghana. Timber originating in Ghana and arriving at an EU point of import without such a permit would be denied entry under a new EU regulation.

Efforts in Ghana to secure the sustainable management of forest resources and forest-linked livelihoods are seriously compromised by high rates of resource depletion. So a credible and robust timber legality assurance system must not be an end in itself but a means to make progress towards improved forest governance. For such a system to be effective it has to deal with timber both in the domestic and export markets.

The VPA Steering Committee recognises that, depending on the options chosen and the degree to which they are pursued, there will be different winners and losers - socially and economically - and different environmental effects. It has thus commissioned an independent assessment of these potential impacts, and a small team led by the International Institute for Environment and Development (IIED) is carrying out this work.

A programme of stakeholder workshops has generated considerable engagement with the issues in developing the VPA, whilst VPA Working Groups are making progress in parallel with the impact assessment in the following areas: legal standard, wood tracking system, domestic market and industry restructuring. One problem with the parallel approach is that all Working Groups and the impact assessment team are aiming to reach their conclusions at the same time – so the prospect of coherent and synergistic recommendations across the groups is limited.

1.2 Reason for urgency - the state of the forest sector in Ghana

If forest users, industries and institutions carry on as usual, Ghana's forests are in deep trouble. Timber and some non-timber resources are being unsustainably exploited and, more worryingly in the long term, the ecosystem services provided by forests are in danger of irreversible degradation. Policy has always played a large part in shaping action in Ghana's forests. Indeed some of the deeper roots of Ghana's current forest problems lie in policy moves of the past (see baseline scenario).

Whilst this situation is depressing, it also shows how dramatic policy effects can be and gives hope that, with the right changes, the situation might be greatly improved. Yet key policy moves that might be made to ensure that some of Ghana's existing forests have a future, and that Ghanaian livelihoods benefit more from them, have been known about for 10-15 years or more. While much has been done in the past 10 years to improve forest and wildlife policies, it has proven difficult to really improve governance in practice and law enforcement has been weak.

Most wood cut in Ghana – perhaps as much as 90% - is used as fuel directly or made into charcoal. It is important to get this into perspective – wood for timber is only a small part of the story. Yet it is a critical part of the story since much timber comes from forests or forest remnants. Demand for timber - from sawmills, furniture makers, building constructors and others - is such that the quantity of logs being taken from the forest reserves is estimated to be at least three times greater than should be harvested if the forests are to be conserved for the future. Some 70% of an estimated national timber harvest of 3.3 million m³ may be illegal.

These issues are pressing for Ghana's timber export and domestic markets alike. The illegal logging and chainsaw lumber, encouraged by the over-capacity in the processing industry and high

levels of domestic demand, feed both export and domestic markets. Hence different “home and away” approaches to pursuing legality are not in Ghana’s best interests.

There is a real danger however that action in Ghana will merely displace the problems to other countries. If Ghana brings its timber production under control, the demand pull effect on weaker governance neighbours could mean increases in illegal logging and governance problems across borders. Trade changes are also likely – on the one hand, the concern of potential trade diversion e.g. to Asian markets as higher standards require higher compliance costs for EU markets; on the other hand, the potential of increasing imports to the Ghanaian market and processing facilities. These potential effects all imply that Ghanaian stakeholders will need to cooperate with those in other countries and suggests that regional or multilateral approaches will be vital to accompany unilateral legal assurance approaches.

The VPA is thus a very useful focus – the trick will be to ensure that it does not divert attention from all other key actions crucial in developing Ghana’s forest resources in more sustainable ways, and that it does substantially contribute to reform of governance in the forest sector.

2. Objectives and approach of the impact assessment

2.1 Objectives and work plan

The objectives of the impact assessment are: to assess, in consultation with stakeholders, the main social, economic and environmental impacts of potential policy options for the VPA in Ghana, and to suggest possible modifications.

Because the VPA Steering Committee felt it inappropriate to state which policy options should be assessed, and because the VPA Working Groups have run in parallel, the impact assessment team had to put concerted effort into accessing information and stakeholder opinion about actual and potential policy and governance actions in Ghana. In consultation with a wide range of stakeholders the team developed three main scenarios in the development of the forest sector in Ghana, known as:

- *Baseline* scenario - current situation projected into the future
- *Legitimate timber* scenario - legality assurance for export and domestic markets
- *Sector reform* scenario – transition to improved forest governance

The development and use of these scenarios is explained further in the next section.

A detailed work plan, with individual team member ToRs, was developed, agreed with the VPA Steering Committee, and pursued by the team (Annex 4). This aimed to be guided by good impact assessment practice and to review existing written information. It involved substantial engagement with a targeted range of stakeholders to garner written and oral information and to seek their opinion on the current and potential future situation under the identified policy measures. Team work enabled assessments and recommendations to be made.

2.2 Scenarios developed for assessing potential impacts of a VPA in Ghana

Each of the three scenarios described below consists of a range of policy measures and the team has attempted to assess social, economic and environmental impact for each of these measures for each of the three scenarios as a whole. These policy measures were identified by the impact assessment team and debated with the VPA Steering Committee (the other way round would have been preferable - see discussion in section A above) which on 22 November 2007 gave its approval for the impact assessment team to proceed on the basis of the scenarios.

Assessment of the potential impacts under these scenarios was attempted for three main points in time – taking stock of the present, and projecting to the years 2012, and 2020. In addition to assumptions in each of these scenarios about changes within the forest sector, the study has made some assumptions about extra-sectoral influences across all three scenarios (see section 3.1).

The three scenarios are as follows:

2.2.1 Baseline scenario - current situation projected into the future

This is the ‘do nothing’ scenario with respect to the VPA, i.e. it assumes that a VPA between Ghana and the EC is not developed, and that no additional moves are made towards a legality assurance scheme (such a scheme is developed in the ‘legitimate timber’ scenario below). But some other policy developments already underway, and trends already evident, will be assumed to further develop – this ‘evolution’ from the present day will be based on assessment of recent trajectories of change in the sector, the resource and policy. For some main bodies of economic, institutional and resource data the scenario will be based on the year 2005, because of time lags in obtaining reliable data in these areas. Policy measures¹ in this scenario include:

- 1.1. **Parallel systems of timber rights allocation.** Administrative allocation of timber rights continues alongside competitive timber rights allocation, through conversion of leases and new allocation to Timber Utilisation Contracts (TUCs). The significance of competitive bidding, and the likelihood of Timber Rights Fees (TRFs) being paid, decreases up to 2012 by which time only administrative allocation continues. Slight increases in stumpage fees (to ‘compensate’ for lack of TRFs) are made.
- 1.2. **Log export ban and chainsaw logging ban.** The ban on export of round logs and the ban on chainsaw lumber stay in place (no clear moves from government to lift them)
- 1.3. **High capacity and low value-addition in the wood industry.** The wood processing industry processes much more wood than can be sustained by the forests and at low levels of value addition to the Ghanaian economy – with continued high environmental and social costs
- 1.4. **Low economic rent capture.** Along with administrative allocation of timber rights (concessions and logging permits) and the log export ban, the falling real value of royalties continue to keep log prices low – keeping forest resources undervalued, mill efficiency low, and credibility of the public administration of forestry weak. Furthermore economic rents from the sector are not well captured - neither by forest owners nor by the state in revenue. A little improvement in the latter is expected.
- 1.5. **Rural communities disenfranchised.** Lack of effective tenure and local control over trees, including lack of royalty rights and inadequate compensation for logging damage to cocoa farms, continues to mean that rural communities are effectively disenfranchised from both forest management and the distribution of forest benefits. Forest loss also continues to result from the lack of alternative livelihood options for communities living in forest areas. Programmes linked to Ghana’s poverty reduction strategy may have some positive effect here.
- 1.6. **Modest plantation growth.** Plantations play a negligible role in wood export markets and a small role in domestic markets. The state continues to slowly establish and manage plantations (from the current area of about 50,000ha) such that by 2020 there is a significant plantation harvest
- 1.7. **Institutional stasis.** The state monopoly in forestry roles continues with no substantial re-arrangements and developments in its institutions.

As well as putting forward the consequences of doing no more than continuing with “business as usual”, this scenario presents a baseline against which the other options can be considered (and in

¹ ‘Policy measures’ in these scenarios are policy, legal and government institutional moves made IN PRACTICE, i.e. actually implemented

due course, with further development, could provide a baseline against which the implementation of VPA and other measures can be assessed).

2.2.2 Legitimate timber scenario - legality assurance for export and domestic markets

This is the scenario in which credible legal and administrative structures and technical systems to verify that timber is produced in accordance with national laws are installed, i.e. the essential elements of a VPA between Ghana and the EC. These structures and systems are designed ultimately to eliminate illegally-produced timber from Ghana's international and domestic trade. Policy measures in this scenario, which differentiate it from the 'baseline' scenario, include:

- 2.1. **Legal standard.** A clear statement of the laws and regulations in Ghana that will, when enforced, constitute 'legal timber'.
- 2.2. **Chain of custody system**, otherwise known as a log or wood tracking system. Improvements on the current system anticipated in the new one include: introduction of improved tagging system for standing trees, logs in transport and bundles of processed wood; introduction of electronic field data capture; introduction of a central database system; timely and systematic reconciliation of data; implementation of post harvest audit; and external verification of data for the purpose of issuing certificates (see below)
- 2.3. **Verification of legality system** – a licensing system and the associated institutional arrangement that issues certificate of legality (likely to consist of certificates of legal compliance and certificates of legal origin). A new Timber Validation Entity (TVE) is proposed to be set up to perform system based verification and issue licenses. It will have field teams to perform field and harbour checks. A committee or council to oversee the functioning of the licensing system is also foreseen in the longer term, and an adjudication process is anticipated to review actions of the TVE that are contested. The TVE will be separated from the traditional role of regulation and management and will be institutionally placed in the Ministry of Lands Forestry and Mines initially.
- 2.4. **Piloting the above legal assurance system.** The above chain of custody, verification and licensing system will be introduced on a pilot basis for a period of 2 years with monitored roll-out of system thereafter. The institutional placing of the TVE in the longer term will be decided in this pilot phase.
- 2.5. **Independent monitoring.** An independent monitor will periodically check/monitor the functioning of the entire system and report accordingly.

Further to the above, the Ghana VPA Steering Committee has made it clear that it would be both inappropriate and unfeasible to implement these basic ingredients in Ghana without taking some additional measures to address key features of the domestic market. The export market both affects and is affected by the domestic market. A domestic market that derives most of its wood requirements from illegal sources while an export market draws on pockets of legality is not a credible basis for a long-term agreement between Ghana and the EU. More importantly, it would do little for Ghana's forests as the high demand for wood from the informal sector is seriously affecting the forest resource base. The 'legitimate timber' scenario in Ghana thus goes beyond the 'essential elements', listed above, for a VPA to include several further policy measures acting in combination. The phasing in over time of these further measures, as with the measures 2.1 to 2.5, would be critical:

- 2.6. **Recognised chainsaw/mobile mill groups within districts.** Small numbers of chainsaw gangs assisted to invest in improved equipment such as mobile mills and to register and operate in a legal manner in each district (while illegal operators are brought to book under the above measures). This would start on a pilot basis, linked to Community Forestry Committees - to supply domestic and household timber demand within and across districts
- 2.7. **Off-reserve enumeration, allocations and spot checks.** Off-reserve trees enumerated using GPS, new system of district allocations trialed, and TVE doing spot checks based on satellite imagery

- 2.8. **Domestic market monitoring.** Monitoring of domestic market wholesale and retail outlets by TVE
- 2.9. **Collaboration with export market monitoring.** Contribution of information to and collaboration with others checking destination of Ghanaian timber (e.g. Ghana-Asia Europe)
- 2.10. **Public procurement policy.** Government in its various forms in Ghana – a major user of timber – required to buy only legally sourced and compliant timber
- 2.11. **Public disclosure** of timber rights holdings and performance, other forestry permits and other information on forest resources
- 2.12. **Awareness campaign.** Widespread information dissemination and public engagement campaign on rights and responsibilities under the above changes
- 2.13. **Facilitated stakeholder engagement.** The stakeholder engagement involved in development of the VPA continued and astutely institutionalised
- 2.14. **Mitigation of some key negative impacts.** Relatively short-term policy measures to mitigate the social, institutional and economic consequences of restructuring around a legal timber supply in line with sustainable practices (but stopping short of the substantial longer term measures foreseen in ‘sector reform’ scenario), e.g. retraining and possible safety-net measures
- 2.15. **Capacity building for the above measures.** Stakeholders in new or revised roles will need support for a range of different capacity building activities to make the above measures effective. Essential capacity building activities are also likely to include: improved programmes of workshops for magistrates, police and customs staff for effective sanction; and capacity for developing the sustainable use of currently lesser used species

The ‘legitimate timber’ scenario assumes substantial governance progress, but sustainable forest management objectives would still be constrained by important policy failures like a highly protected processing industry.

2.2.3 Sector reform scenario – transition to improved forest governance and sustainability

This is the scenario in which a more complete package of reforms in the forest sector is concertedly pursued to achieve the shift to better forest governance long desired by a wide range of stakeholders. Wider fiscal, regulatory, trade and tenure improvements have been identified as constituting important policy or governance priorities for sustainable forest management in various analyses of the sector dating from the early 1990s. Policy measures in this scenario, which also incorporates the measures in the ‘legitimate timber’ scenario, include:

- 3.1. **Increased stumpage fees, competitive bidding and effective revenue collection.** Increased stumpage fees for timber and appropriate pricing of timber and other forestry based products installed in order to increase revenue and address the problem of under pricing of forestry resources. Revenue collection systems will be improved.
- 3.2. **Catalysed industry capacity reduction.** Stimulation through policy of a voluntary programme of industry capacity reduction to tackle overcapacity directly. Funded in part by the remaining industry and offering financial packages to company owners and their employees so they can exit the industry.
- 3.3. **Incentives for downstream processing.** Fiscal as well as market based incentives to improve the efficiency of the timber industry and encourage downstream processing of wood products. Measures might include those for small scale enterprise such as improved grading rules and help for small furniture carpenters to partner with sawmills in schemes to ensure appropriate domestic timber supplies
- 3.4. **Enabling framework for investment in plantations.** Enabling actions for development of the forest plantations to cover the wood deficit in the timber industry and improve environmental quality.
- 3.5. **Facilitated investment in small enterprise.** Development of information provision, capacity building, finance and partnership brokering, and investment facilitation support functions for forest-linked small enterprises in rural communities (including former

employees, chainsaw operators and households negatively impacted by new effective restrictions)

- 3.6. **Regularised chainsaw/mobile mill lumber trade.** Roll out nationally the programme of enabling improved chainsaw and mobile mill lumber produced by registered groups to be produced for the domestic market. This would involve a range of practically tested systems and include amendment to LI 1649
- 3.7. **Penalties updated and justice system upgraded.** Work to further rationalise the structure of fines and penalties that affect the forest sector
- 3.8. **From forest benefits to forest rights - including farmer tree tenure.** Concerted efforts to ensure equitable distribution of benefits to communities, resources owners and farmers. More fundamentally - revision and clarification of land and tree tenure for collective and farmer tree rights. This would include amendment of 1962 Concessions Act so that farmers can utilise timber trees. A mosaic of management arrangements in forest reserves would then be possible: with timber utilization contracts and community-managed forests (production and dedicated forests); co-management of forest blocks with private sector (natural forest and plantation forest); and convalescence areas could similarly be contracted out for silvicultural treatment. Outside the reserves, farmer tree ownership rights and community agreements with local lumber producers help in regularising chainsaw lumber production. The assumption will be towards ceding management of all off-reserve forest resources to communities.
- 3.9. **Stakeholder decision-making.** Transparent and participatory approaches to policy making and decision taking will enable the above bold policies to be implemented and sustained and institutional capacities to be built. Community Forestry Committees will be given strong support and a programme of partnership forums at district, regional and national continued. The stakeholder policy advisory committee to the MLFM will be further developed and supported.
- 3.10. **Regional cooperation.** Cross-border impacts and 'leakage' from the improved control of Ghanaian timber are likely – potentially exacerbating illegal logging in other countries. Ghana will need to step up active collaboration with countries in the region to reduce this potential.
- 3.11. **Capacity building for above policy measures.** Stakeholders in new or revised roles will need support for a range of different capacity building activities to develop the knowledge and skills to fulfill them

In section 3.11 we discuss the implications of the findings for working out which of the above potential policy measures are 'dependent' on each other for their effects and which are relatively 'independent'. This is vital in thinking about potentially appropriate and effective policy packages.

3. Findings

3.1 Quality of evidence base, caveats and assumptions underlying findings

Evidence base. The information accessed, developed, modelled and analysed in this work has a number of strengths and weaknesses. The evidence base derives from four main elements:

- Some 95 key references and other recorded information sources reviewed (Annex 1)
- About 110 resource people and stakeholders interviewed and, in some cases, repeatedly engaged with (Annex 2)
- Modelling of industry, institutional and economic data, generally from 2005 as the base year, under the above-described scenarios (see results below and detailed tables in Annex 6)
- A sample of 164 primary stakeholders in informal enterprise, labour and forest communities were surveyed for their views (Table 1)

Table 1. Primary stakeholders in informal enterprise, labour and forest communities surveyed

Stakeholders surveyed	Location	Sample size
Chainsaw operators	Goaso, Kade	2
Lumber brokers	Ofankor, Kumasi, Kasoa, Ashaiman	12
Furniture makers	Kumasi	3
Woodworkers	Kumasi	6
Re-saw millers	Kasoa, Ofankor, Kumasi	3
Charcoal producers and retailers	Kumasi	3
Artisans	Kumasi	2
Formal sector employees	Accra, Abofour, Kumasi	11
Bamboo and rattan user groups	Accra	2
Farmers and community members	Fosu, Oda, Kade	120
TOTAL		164

The impact assessment team considers the evidence base to be adequate to make some indicative assessments. However, the estimates and assessments are not empirically robust and should be treated with caution. Some of the reasons why are explained below.

Caveats. There are major uncertainties surrounding the true levels of stocks and flows from the Forest Reserve and Off-Reserve resources in particular. The last major forest inventories were undertaken in 2001-2002 and 1996-1997 for the Forest Reserves and Off-Reserve resource respectively. Official data via the Tree Information Forms (TIF) are an unreliable guide to the harvest levels due to unknown levels of illegal logging by both the formal and informal sector (Birikorang *et al*, 2007). This study has therefore relied on earlier studies on the Ghana forest industry and a wide stakeholder consultation to estimate levels of illegal logging by both the formal and informal sector (Birikorang *et al*, 2001; Birikorang *et al*, 2007).

For example, an unpublished study on resource flows commissioned under the Validation of Legal Timber Programme (VLTP), estimates total current harvest at 3.4-3.7 million m³, three to four times the official harvest, with an illegal cut of some 2.1-2.7 million m³ (Hansen *et al*, 2007). The share of the illegal cut between forest reserves and off-reserve forests is unknown and cannot be reliably estimated, but it is thought that an increasing proportion of illegal felling takes place in the Forest Reserves.

In view of the uncertainties surrounding the underlying stocks and flows, a significant research study is needed to provide a more robust basis for estimating the likely stakeholder impacts of a VPA agreement. This will require forest inventories, surveys of illegal logging levels and careful analysis of future forest flows under a range of policy/governance scenarios, ideally with econometric analysis of how the various policy and governance reforms would impact on stakeholder behaviour.

The analysis below draws on comparative data which suggests various economic, social and political implications of exercising various options defined by the study. However, it should also be pointed out that, given that many of these findings stem from the above-qualified current and future flow estimates, the actual experience of impact of these individual options may differ significantly from that predicted here.

Assumptions. Some of the main assumptions made in the work – in particular the modeling work – are described below.

Assumptions about the Baseline Scenario. The assumptions behind the Baseline Scenario estimates in general follow the analysis of stocks and flows carried out for the VLTP (Birikorang *et al*, 2007; Hansen, 2007; Hansen *et al*, 2007). These include an estimated two-thirds of total harvest from forest reserves, although the same studies point out that the Forest Reserve/Off-Reserve proportion is unknown due to the high incidence of illegal logging. The species mix in the total harvest was derived from a combination of official harvest data (TIF), and the estimated

roundwood equivalent of exports and estimated domestic consumption (Birikorang *et al*, 2007). This revealed that about 10% of total harvest is composed of high demand species and 70% moderate demand species.

The 2005 baseline harvest is estimated at 3.3 million m³ roundwood equivalent (RWE) divided approximately equally between the 'formal' and 'informal sector'. The formal sector refers to registered companies, including small-scale loggers such as the Ghana Timber Association (GTA) group. The informal sector refers mainly to chainsaw operators operating outside the (current) law. It should be noted however that these terms are not synonymous with legal and illegal logging: the formal sector cut includes an estimated 60% illegal cut above the recorded or official harvest of 935,000 m³. These estimates are conservative; one estimate of total harvest is 3.4-3.7 million m³ (Hansen, 2007).

It is (perhaps optimistically) assumed that the 2012 baseline harvest will be the same as 2005, except for a reduction in high demand species, which are assumed to fall by 50% from the Off-Reserve resource (the low demand species' harvest is increased correspondingly). This is conservative since high demand species are reported to be already scarce outside the Forest Reserves (Hansen *et al*, 2007). The Off-Reserve TIF data reveal that the average annual cut of high demand species for 2004-2006 was 7,448 m³ compared to 67,540 m³ for 1998-2000, a fall of 90%.

For the 2020 Baseline situation, the harvest level is based on the assumption that the remainder of the high and moderate demand species in 2020 will be no more than half of the Resource Management Resource Centre (RMSC) estimate of the sustainable VLTP cut (Birikorang *et al*, 2007). Given the importance of the RMSC estimate for all the Scenarios, especially the Legitimate Timber and Sector Reform Scenario estimated, it is presented in Table 2.

Table 2. RMSC Optimistic and Pessimistic Estimates of the VLTP Allowable Annual Cut for the Formal Sector (thousands of cubic metres roundwood)

Species category	Forest Reserves			Off-Reserve Forest			Total average 000 m ³
	Optimistic 000 m ³	Pessim. 000 m ³	Average 000 m ³	Optimistic 000 m ³	Pessim. 000 m ³	Average 000 m ³	
High demand	10	0	5	5	0	3	8
Moderate demand	200	150	175	215	130	173	348
Low demand	250	200	225	20	15	18	243
Other species	125	100	113	10	5	8	120
Total	585	450	518	250	150	200	718

Source: RMSC for this study.

The sharp reduction in high and moderate demand species estimated for 2020 is supported by a comparison of the 1989 and 2001 Forest Reserve inventories (Davies, 2003). This found that the above felling limit standing volumes of high and moderate demand species fell by 68% and 40% respectively over this 12 year period. By 2020, it will be over 30 years since from the 1989 inventory. Hansen (2007) also notes that the high demand species are being harvested at about four times their 'indicative felling limits'.

For the 2020 Baseline harvest, it is assumed that the informal sector will continue to compete aggressively for moderate demand species, and would harvest the same total cut as 2005 and 2012 (1.7 million m³) by substituting the lesser used species (low demand and other species) for the increasingly scarce high and moderate demand species. This builds on the observation that the domestic market has an elastic demand as regards individual species – a large share of the domestic market seems prepared to substitute lesser used or known species at current prices (Birikorang *et al*, 2007).

Assumptions about the Legitimate Timber Scenario. The basis for the estimated 2012 Legitimate Timber Scenario estimate for the formal sector is the average of the optimistic and pessimistic RMSC estimates presented in Table 2. It was felt that the optimistic estimate would be too high considering the VLTP reference period - by 2012 the stock will have been further eroded. For the informal sector, it is assumed the Legitimate Timber Scenario package reduces the cut of high and moderate demand species by about 20% compared to the 2012 Baseline Scenario.

The 2020 Legitimate Timber Scenario harvest also assumes further erosion of the resource due to the continuation of significant policy and governance failures, for example, non-competitive pricing, a log export ban and weak governance in some areas. Therefore the pessimistic RMSC estimate of the VLTP sustainable cut is used for the formal sector harvest estimate. For the informal sector, it is assumed that the Legitimate Timber Scenario package reduces the informal cut to half of the 2020 Baseline Scenario cut.

Assumptions about the Sector Reform Scenario. For the Sector Reform Scenario, the optimistic VLTP estimate of RMSC is used for the total formal sector harvest, with the informal sector cut reduced to 170,000 m³, 10% of the baseline sector cut, as a result of a comprehensive approach to the formalisation and legalisation of the sector in the form of community enterprises as well as stronger legal compliance (it is unrealistic to expect to eliminate illegal chainsaw operators completely by 2020). Since in this scenario the main policy and governance failures are tackled, this harvest level should be maintained in 2020 and beyond.

Assumptions about prices, imports, processing efficiency and plantation timber. As regards pricing and imports, this is a complex dynamic. From the supply side, increasing scarcity, partly resulting from better governance and control of illegal logging, should drive up domestic prices. On the other hand, the log export ban will continue to depress domestic prices; a domestic market supply gap may be partially met by illegal overland imports from neighbouring countries; another factor is the switch from higher to lower value species as high and moderate demand timbers dwindle. It is observed that domestic consumers seem willing to switch from known and popular to lesser used species without a significant drop in prices. This is because timber demand is probably quite inelastic overall.

As domestic timber supplies dwindle, there will be increasing recourse to imports. Assuming these are legal (a major assumption implying substantial international cooperation), this should increase domestic prices, especially in the Sector Reform Scenario. Thus in the Sector Reform Scenario, import and domestic log prices converge, but domestic lumber prices stay the same as in the other scenarios (see Annex 6). There is an expectation that the processing sector can switch to using imported wood as domestic supply dwindles. This means paying full CIF import prices to the port plus a transport cost to the mill. Conversion rates would have to increase sharply for this to be profitable, in fact to international efficiency levels². In the Sector Reform Scenario, it is assumed that the required technical improvements will happen so that the timber recovery factor is increased from 34% to 45%. However, the impact of sector improvements is not generalized across primary product segments. Another response may be for entrepreneurs to shift their capital to other sectors, or even to other countries, as profit margins are squeezed. A wider concern of Ghana increasing its timber imports is the effect of its 'ecological footprint' on forest governance objectives in neighbouring or more distant forest-rich countries.

Plantation timber will gradually add to the supply of timber available to the industry. Much of this is currently exported in the form of teak logs, although such teak log exports are likely to be banned in the near future. In 2020 it is estimated that 40,000 m³ of private sector plantation timber would be supplied, but that Forestry Commission plantations would not yet be mature. This amount of timber will have only a marginal effect on the findings.

² It is unlikely that sawmills and rotary mills will find it viable to use imported logs or lumber, unless it is illegal and therefore cheap.

Assumptions about the forest industry. The technical assumptions used for the forest industry economic models are numerous. Some are presented in tabular form in Annex 6, but most are discussed in the findings narrative. A key assumption is that the industry will adapt to using an increasing proportion of lower value species. These could be supplied partly to the export market and partly to the domestic market. It is observed that domestic consumers seem willing to accept lesser used species for construction and other uses, and are prepared to pay similar prices to the higher value species. This increases the prospects of the industry being able to viably supply the domestic market with products based on these species – as is the case with the Legitimate Timber and especially the Sector Reform Scenario. It is to be expected that prices of high and moderate demand species will increase with scarcity and as imports increase, and that this will result in a smaller more efficient export industry.

Processing conversion ratios or wood recovery factors in the Baseline and Legitimate Timber Scenarios are based on the technical survey undertaken as part of the 2001 Ghana Wood Industry Study (Birikorang *et al*, 2001). In the case of the Sector Reform Scenario it is assumed that the recovery factor improves as a result of technical improvements made partly in response to higher roundwood values.

The impact assessment team recognizes that the assumptions used in this study are myriad, and some are simplistic. This is largely due to an incomplete modeling process for reasons already stated. It is complex to fully incorporate demand, scarcity, pricing and import effects into the economic models. Much more time and data would be needed to develop a sophisticated economic model of the type needed for robust estimates³.

3.2 Stakeholder numbers and scale of forest use – current situation

Beyond characterising the state of the forest sector in Ghana and spelling out the current prevailing policy context in the ‘baseline scenario’ – this report does not go into detail about the current dynamics, practices and scales of usage of, and dependence on, forest resources in Ghana (Annex 1 lists various key sources which do this). However, a basic characterisation and indicative estimation of the numbers and scale of forest use or livelihood linkage of each of the main stakeholder groups that are the focus of this work is given in Table 3. It should be noted that not all ‘categories’ of ‘forest stakeholder’ are covered since this focus is primarily on timber and the ‘primary’ stakeholders in timber resources (those with rights and major interests in timber). Thus, important forest stakeholders such as non-timber forest product user groups/producers, charcoal and fuelwood enterprises and urban consumers are not highlighted here. Nevertheless, some indicative assessments of impacts affecting these stakeholders are given in sections 3 and 5 of this study.

Table 3. Indicative estimates of the numbers of primary stakeholders and their turnover or other key value derived from forests

Stakeholders	Numbers of organisations/people and annual turnover or other key value derived from forests
Large-medium scale tertiary. Furniture, window and door manufacture, flooring, mouldings, turnery, handicrafts etc	<input type="checkbox"/> 40 companies supplying the domestic market <input type="checkbox"/> 6 companies exporting
Rotary veneer/plywood mills. Rotary peeling of logs and drying of veneer in preparation for plywood manufacture	<input type="checkbox"/> 9 integrated and 14 non-integrated rotary veneer mills, with a turnover of US\$ 13 and 4 million respectively <input type="checkbox"/> 5 integrated and 10 non-integrated plywood mills with a turnover of US\$ 21 and 4 million respectively
Sliced veneer mills. Secondary processing of fitches into sliced veneer in preparation for	<input type="checkbox"/> 9 integrated mills with a turnover of US\$ 36 million <input type="checkbox"/> 5 non-integrated mills with a turnover of US\$ 2

³ One member of the team has been involved in developing a general equilibrium model for Canada’s forest sector - a five-year effort so far.

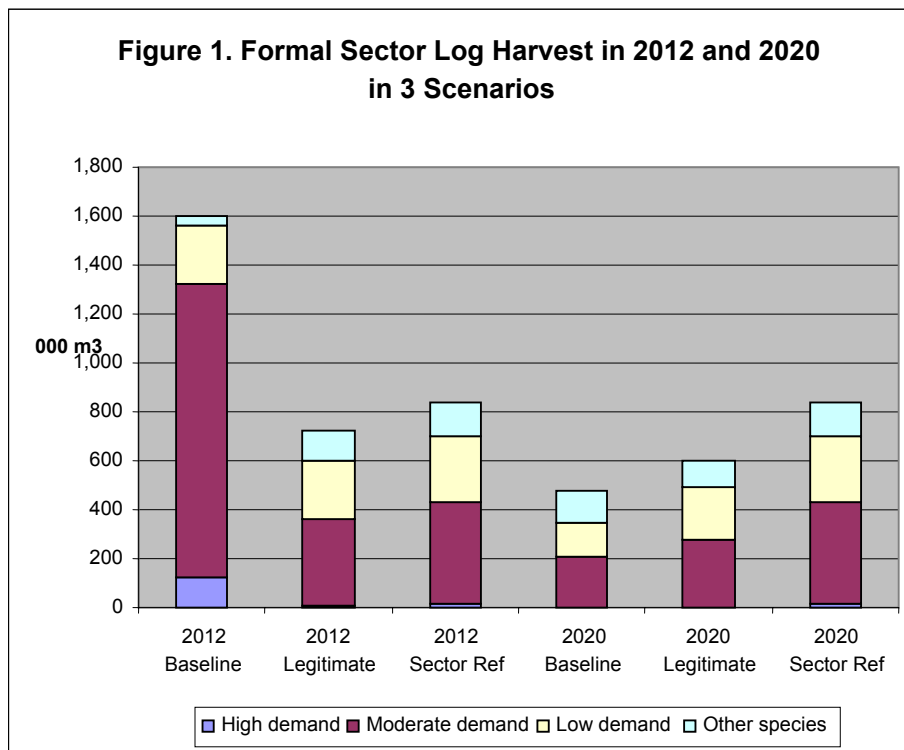
plywood manufacture	million
Saw mills. Sawing of logs into lumber or preparation for further processing such as boules, boards for kiln-drying and flitches for veneer slicing	<input type="checkbox"/> 8 integrated mills with a turnover of US\$ 92 million <input type="checkbox"/> 182 non-integrated mills with a turnover of US\$ 23 million
Integrated loggers. Logging integrated with a log processing plant	<input type="checkbox"/> 8 companies with a turnover of US\$ 24 million
Independent (un-integrated) loggers. Smaller scale loggers without saw mills	<input type="checkbox"/> About 503 companies in the Ghana Timber Association with a turnover of US\$ 32 million
Employees of timber companies. Employees not including those in the large-medium scale tertiary	<input type="checkbox"/> About 10,115 employees in the above timber companies
Chainsaw operators. Machine operators with several assistants - gangs. (The owners of the chainsaws are often lumber brokers, wholesalers and retailers - see below)	<input type="checkbox"/> About 17,000 chainsaw milling crews, each with an average of 4 persons
Trade hands and porters. Porters who carry chainsaw lumber, truck loaders, truck owners and drivers and assistants	<input type="checkbox"/> About 264,000 people involved in the chainsaw-milled lumber haulage sector
Informal sector timber wholesalers and retailers. Chainsaw lumber sellers/brokers, often also chainsaw owners – example: 6 or 7 ‘tycoons’ in a district each providing chainsaws to 15 or 20 chainsaw gangs	<input type="checkbox"/> About 21,000 people involved in re-sawing chainsaw-milled lumber <input type="checkbox"/> About 1300 chainsaw lumber brokers each engaging about 3 people (total employment in the chainsaw lumber production and selling process about 350,000) with a total turnover of about US\$ 58 million
Small scale tertiary and artisans. Furniture, windows and doors, carpenters, wood carvers and canoe carvers, handicrafts	<input type="checkbox"/> About 30,000 small scale carpenter firms (41,000 members in the Woodworkers Association of Ghana) employing some 200,000 people <input type="checkbox"/> About 5000 woodcarvers and 1500 canoe carvers
Civil society organizations. Non-governmental organizations (NGOs) and community based organizations active on forest policy or field issues	<input type="checkbox"/> About 150 NGOs and CBOs in the forest sector
Farmers/Forest Fringe Communities. Forest edge farmers and communities obtain limited economic benefits and user rights to trees (because chiefs own timber trees) – yet derive significant values from forest products	<input type="checkbox"/> About 14% or 3 million of Ghana’s people are in forest fringe communities, and about 35% of their livelihood is derived from forest resources. With a GDP per capita of US\$ 430, the annual income of fringe communities from forest resources could be in the order of US\$ 450 million
Traditional authorities. As landowners, Chiefs are recognized by the state as the legitimate recipients of timber revenues	<input type="checkbox"/> There are at least 150 traditional councils <input type="checkbox"/> Stool chiefs are currently getting about US\$ 1 million in annual revenue, traditional authorities about US\$ 700,000
Central and local government agencies. Lead Ministry is Lands Forestry and Mines; others include Ministries of Finance, Trade and Industry, Local Government and Rural Development. Timber royalties can be a significant source of revenue for District Assemblies.	<input type="checkbox"/> Ministry of Finance and Economic Planning receives about US\$ 7 million in annual forest sector revenue. The Office of the Administrator of Stool Lands receives US\$ 400,000 <input type="checkbox"/> Some of the 138 District Assemblies collectively receive about US\$ 2 million in annual forest sector revenue, but there is little link evident spending on forest edge communities
Forestry Commission. Comprises Forest Services Division, Wildlife Division, Timber Industry Development Division, Wood Industries Training College and Resource Management Support Centre. It is committed to a service charter	<input type="checkbox"/> Some 266 forest and wildlife reserves managed by the Forestry Commission (FC) <input type="checkbox"/> About 3200 permanent employees in the FC <input type="checkbox"/> About US\$ 17 million annual forest sector revenue received by the FC

Sources: Adam *et al* (2006), Amanor (2000) and this study

3.3 What will happen to the timber resource?

Annex 6 presents the full set of estimates for the three scenarios. Figure 1 compares the situation for the formal sector in 2012 and 2020 in the three scenarios. Comparison of the 2012 and 2020 Baseline columns shows the ‘hard landing’ scenario. It is predicted that the harvest available to the formal sector may fall to about 500,000 m³ with no high demand species and only about 200,000 m³ moderate demand species. This compares to a slightly softer landing as regards the other two scenarios in 2020, although the 2012 comparison shows the sharp correction needed to current harvest levels. As already mentioned, the deterioration of the Legitimate Timber Scenario in 2020 compared to 2012 is due to continuing governance and policy failures – while the Sector Reform Scenario should result in a higher and sustainable supply of wood to the formal sector, possibly 835,000 m³ according to the VLTP sustainable cut estimate, half of which could be moderate demand species.

Figure 2 presents the situation for the informal sector composed of illegal chainsaw operators. This reveals how in the Baseline Scenario, the 2020 harvest may be similar to 2012 but with lower demand and other species replacing high and moderate demand species. Under the Legitimate Timber Scenario the informal cut could be halved by 2020 with the domestic market measures envisaged in the VPA strategy, but will still be significant. In the Sector Reform Scenario, the informal sector should become insignificant (estimated here at 10% of the Baseline harvest).



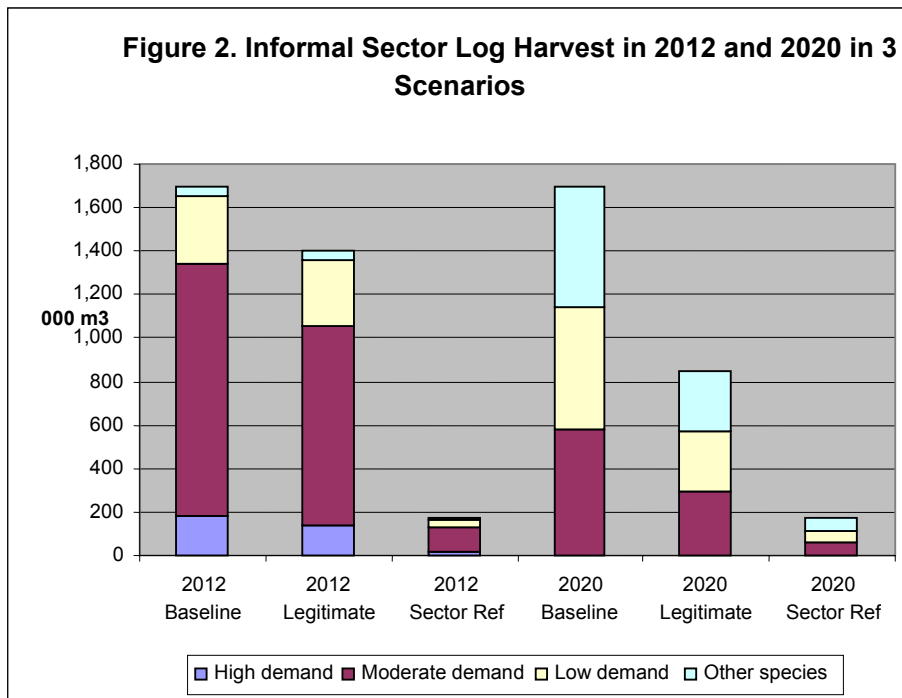
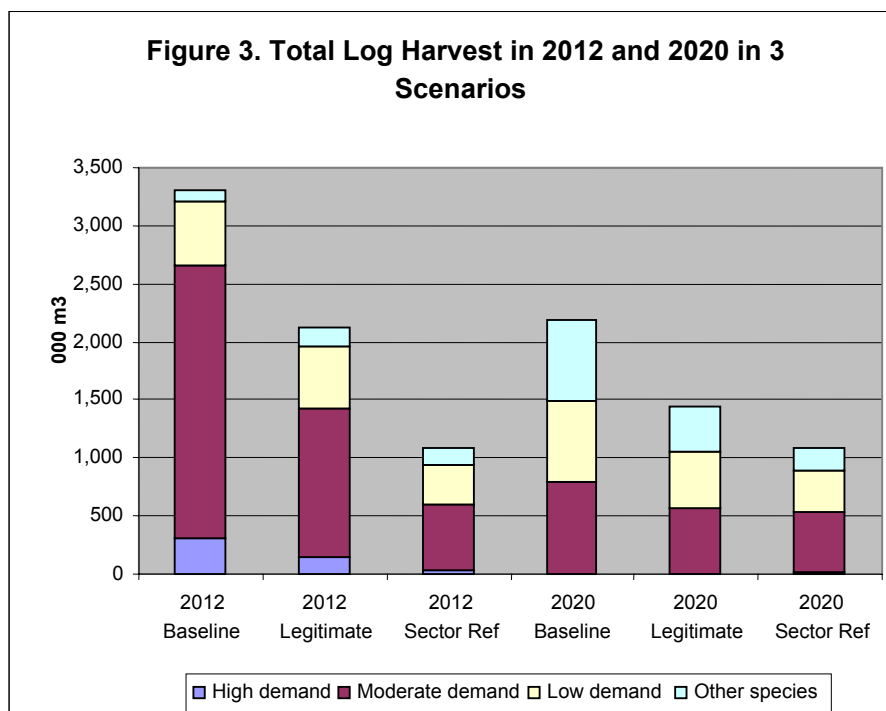
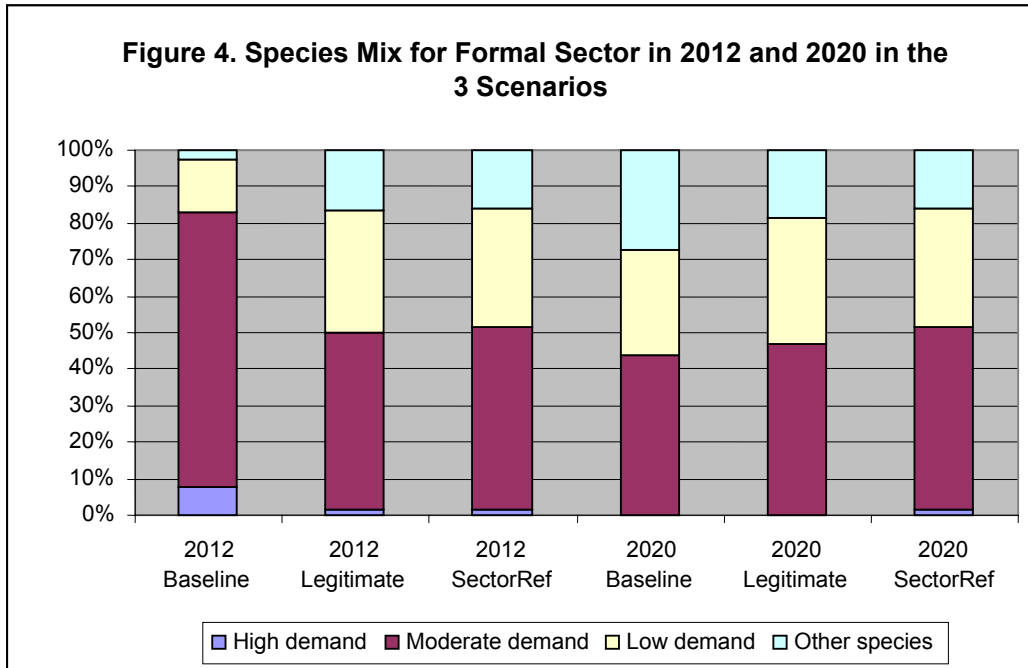


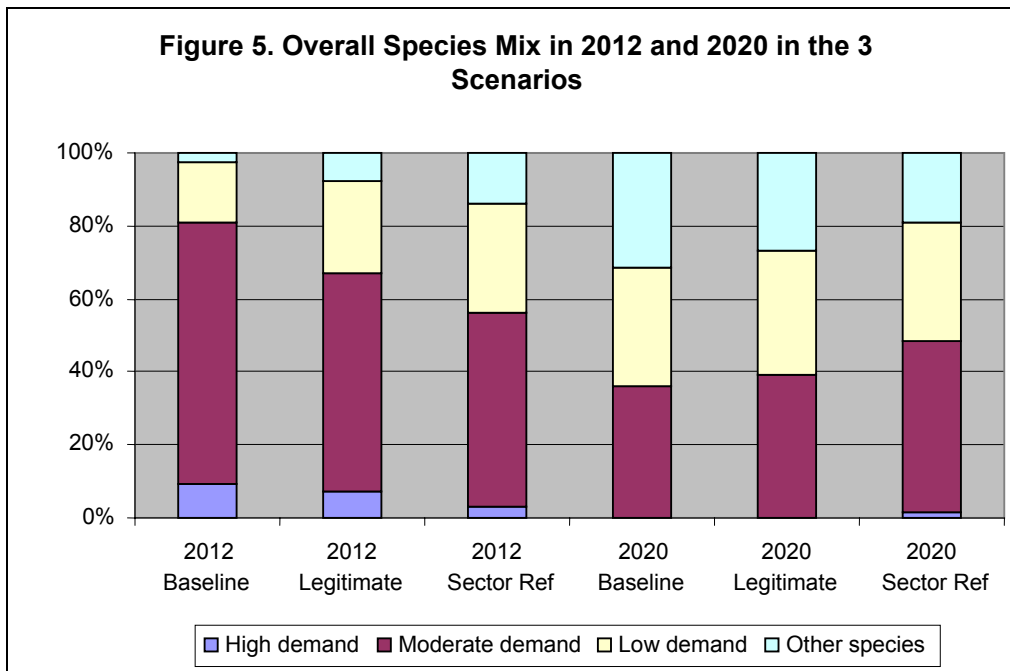
Figure 3 shows the total harvest estimate. According to the assumptions made, the 2020 Baseline harvest could be a little above 2 million m³, about two-thirds of the 2012 harvest but with a very different species mix. Continuation of the unsustainable harvest by the informal sector means that the 2020 Baseline harvest is still considerably higher than the 2020 Legitimate Timber and Sector Reform Scenarios of about 1.5 million m³ and 1.1 million m³ respectively. However by 2030 or even 2025 the graph would look very different with many of the moderate demand species likely to be exhausted. At some point the Legitimate Timber Scenario harvest would fall below the sustainable Sector Reform Scenario harvest.



Species mix in the three Scenarios

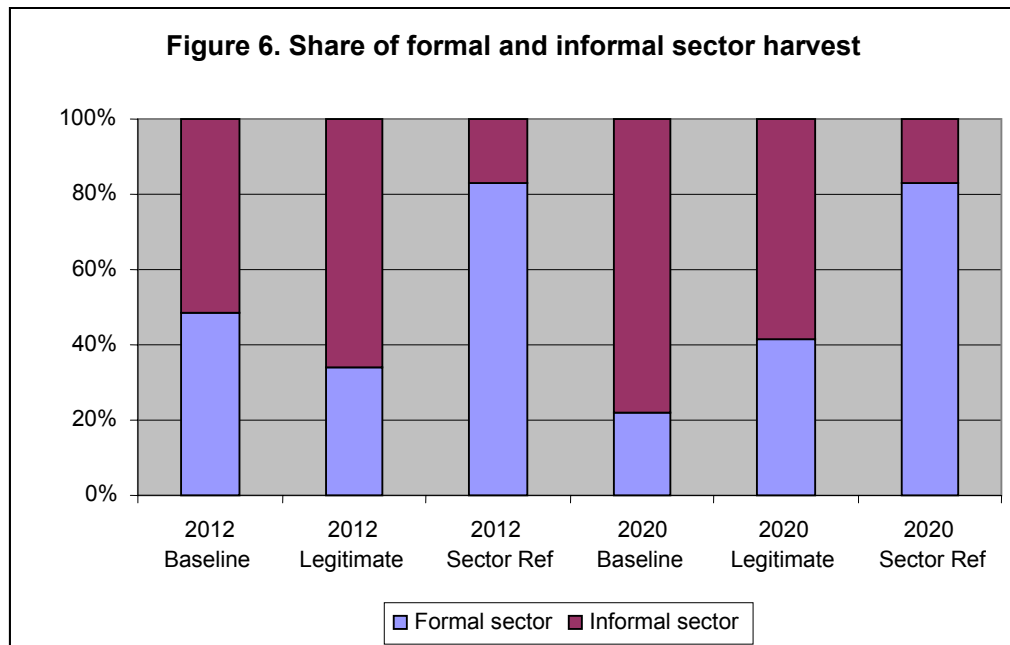
Figure 4 shows the estimated species mix for the formal sector. In the Baseline Scenario, by 2020 the formal sector would only have about two-fifths of available harvest as moderate demand species, compared to over 80% in high and moderate demand species in 2012. This implies significant industry investment and adaptation to process lesser used species. For the informal sector, the increase in the proportion of lesser used species is less of an issue due to the elastic demand to individual species already noted. In the Legitimate Timber and Sector Reform Scenarios, about half the harvest may be in moderate demand species; thus whatever the scenario the industry will need to adapt, unless it is able to improve its recovery rates sufficiently to use imported wood. Figure 5 presents the species mix for the combined formal and informal harvest. This again shows how the Sector Reform Scenario would have a higher proportion of moderate demand species – perhaps almost a half of total harvest.





Proportion of harvest between the formal and informal sectors

Figure 6 presents the estimated share of the formal and informal harvest in the three scenarios. This shows how the formal sector share could decline to a fifth of total harvest in the Baseline 2020 situation compared to about half currently; while it could be four-fifths of total harvest in the Sector Reform Scenario and two-fifths in the Legitimate Timber Scenario.



3.4 What will happen to the industry?

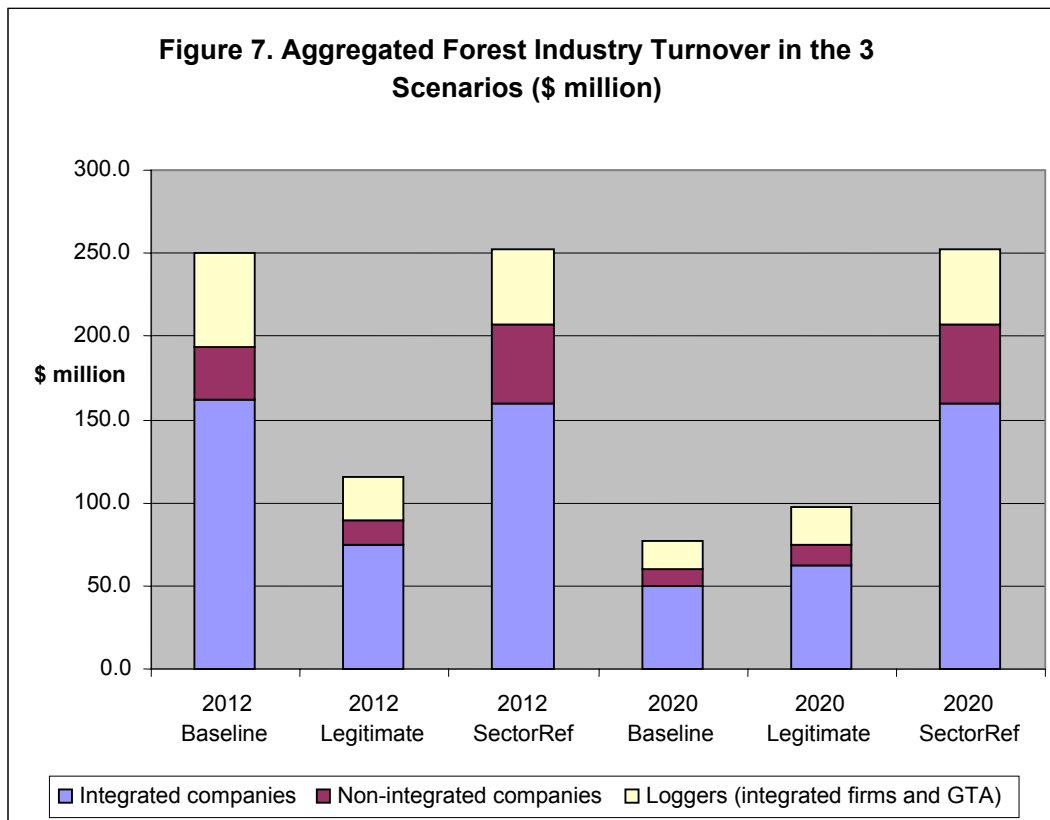
Overall turnover (gross value of production)

It is assumed that 80% of the primary processing sector is composed of about ten leading integrated companies which are thought to account for 80% of wood exports (Birikorang *et al*,

2001). Figure 7 shows an apparent choice for the primary processing industry between a 'hard landing' in the Baseline Scenario, a slightly softer landing if the Legitimate Timber Scenario is adopted, and maintenance of a similar turnover in the Sector Reform strategy is adopted. Industrial turnover (or gross revenue) of the primary processing and logging sectors is set to fall in the Baseline Scenario from an estimated \$250 million in 2012 to about \$80 million in 2020 – the 'hard landing'. In the case of Legitimate Timber Scenario a slightly softer landing would take place in 2012 with an approximate halving of turnover. The Sector Reform strategy achieves a similar turnover level to the Baseline Scenario in 2012 due to:

- ❑ A more efficient conversion ratio or recovery factor resulting from technical investments;
- ❑ Substantial supply of the domestic market by the industry, as opposed to the informal sector;
- ❑ Use of imported logs and lumber;
- ❑ Large increases in sliced veneer and plywood production
- ❑ Domestic log prices which are closer to international prices.

After 2012, turnover would be maintained under the Sector Reform Scenario, but would continue to fall in the Legitimate Timber Scenario, although not as low as in the Baseline Scenario.



It should be noted that this is before taking account of a major potential increase in the tertiary sector in the Sector Reform Scenario. Further analysis shows tertiary export and domestic (formal sector) production could have a turnover value of about \$140 million. There was insufficient time to estimate tertiary processing turnover for the Baseline and Legitimate Timber Scenarios, but it would be much lower. Tertiary exports are estimated to be currently 5% of wood product export earnings compared to an estimated 20% of export earnings in the Sector Reform Scenario.

Loggers

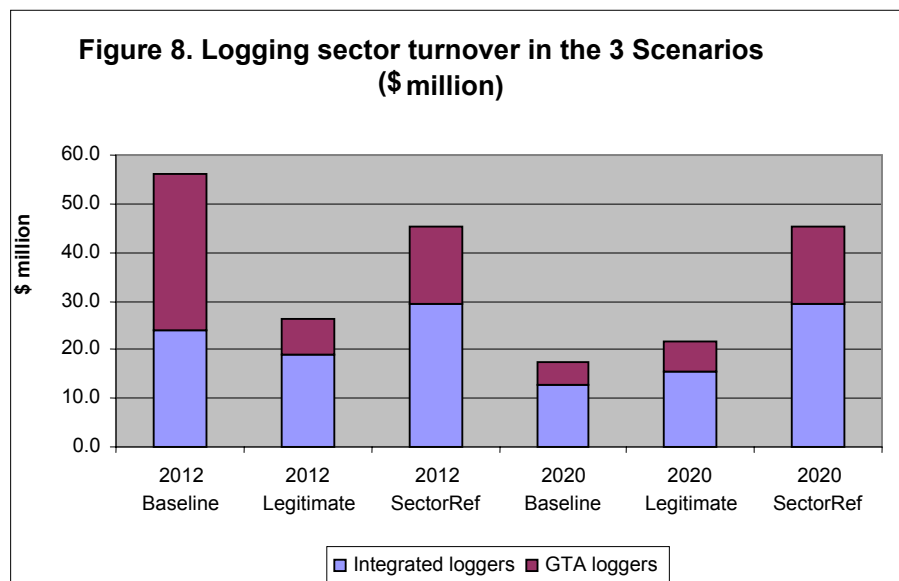
Table 4 presents gross revenue or turnover and profitability (gross margin as a percentage of total cost) for the logging sector in the three scenarios. The gross margin is the gross revenue less the

cost of production, taxes and sales (marketing, transport, etc.). For integrated companies, the negative logging profitability reflects the depressed domestic log price (due to the log export ban) and a cheap input for processing. With their lower fixed costs, the small or GTA loggers are more profitable

Table 4. Size and profitability of the Logging Sector under the 3 Scenarios

		2012 Baseline	2012 Legitim. Timber	2012 Sector Reform	2020 Baseline	2020 Legitim. Timber	2020 Sector Reform
Gross revenue							
Integrated loggers	\$ million	24.1	18.8	29.3	12.7	15.3	29.3
GTA loggers	\$ million	32.1	7.3	16.2	4.6	6.5	16.2
Gross margin as % of cost							
Integrated loggers	%	-65%	-26%	-20%	-33%	-50%	-20%
GTA loggers	%	46%	10%	18%	-14%	-1%	18%

Figure 8 shows the logging sector turnover for integrated and small or GTA loggers. This shows that the fall in gross revenue from the Baseline 2012 Scenario to the Sector Reform Scenario would be modest compared to a hard landing in the other two scenarios.



Integrated processing companies

Table 5 presents gross revenue or turnover and profitability for integrated processing companies, and Figure 9 shows the share of turnover between the four main processing lines.

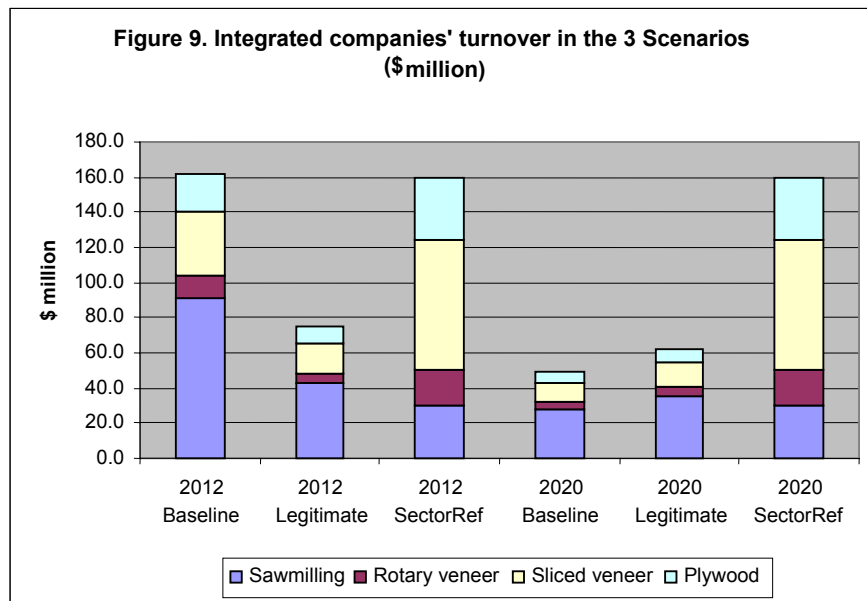
Table 5. Size and Profitability of the Industry: Integrated Processors

		2012 Baseline	2012 Legitim. Timber	2012 Sector Reform	2020 Baseline	2020 Legitim. Timber	2020 Sector Reform
Gross revenue							
Sawmilling	\$ million	91.6	42.4	30.0	28.2	35.5	30.0
Rotary veneer	\$ million	12.6	5.8	20.2	3.9	4.9	20.2
Sliced veneer	\$ million	36.2	16.7	74.2	11.1	14.0	74.2
Plywood	\$ million	21.0	9.7	35.5	6.4	8.1	35.5

Gross margin as % of cost

Sawmilling	14%	-10%	-135%	-33%	-19%	-135%
Rotary veneer	-79%	-129%	-66%	-178%	-148%	-66%
Sliced veneer	44%	28%	58%	12%	22%	58%
Plywood	40%	23%	-23%	7%	17%	-23%

This again shows the likely hard landing for the industry in 2020, with turnover of all production lines falling by over two-thirds. Sawmilling appears to be unprofitable in all situations except the 2005/2012 Baseline Scenario. Rotary veneer is unprofitable in all situations, while sliced veneer is most profitable of the four production lines in all situations. Figure 9 also shows that the Sector Reform Scenario should obtain a similar turnover as for the 2012 Baseline but mainly through sliced veneer and plywood rather than sawmilling.



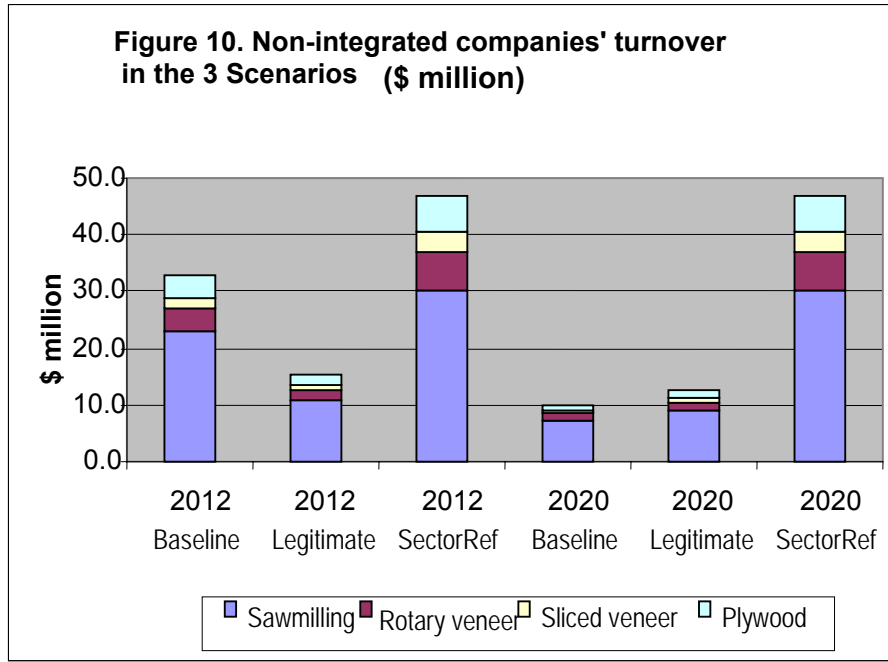
Non-integrated processing companies

Table 6 presents the same parameters for the non-integrated companies. This shows a similar picture with the hard landing in the 2020 Baseline situation, and a much higher turnover for all production lines in the Sector Reform Scenario. Sliced veneer is consistently profitable, while rotary veneer is unprofitable. Sawmilling becomes profitable in the Sector Reform Scenario, assuming its conversion efficiency is improved.

Table 6. Size and Profitability of the Industry: Non-integrated Processors

		2012 Baseline	2012 Legitim. Timber	2012 Sector Reform	2020 Baseline	2020 Legitim. Timber	2020 Sector Reform
Gross revenue							
Sawmilling	\$ million	22.9	10.6	30.0	7.1	8.9	30.0
Rotary veneer	\$ million	4.2	1.9	6.7	1.3	1.6	6.7
Sliced veneer	\$ million	1.9	0.9	3.9	0.6	0.7	3.9
Plywood	\$ million	3.7	1.7	6.3	1.1	1.4	6.3
Gross margin as % of cost							
Sawmilling		14%	-5%	40%	-19%	-10%	40%
Rotary veneer		-79%	-119%	-63%	-149%	-131%	-63%
Sliced veneer		44%	20%	38%	11%	17%	38%
Plywood		40%	21%	-2%	11%	17%	-2%

Figure 10 shows that in this case the total turnover of non-integrated companies in the Sector Reform Scenario is superior to the Baseline Scenario, and over double the 2020 Baseline and Legitimate Timber Scenarios. Most of this turnover is contributed by sawmilling with its higher profitability than the other production lines. This assumes a better conversion efficiency than the other production lines.



3.5 What will happen to chainsaw operators?

Figure 2 above reveals what is likely to happen to the 'informal sector' or illegally operating chainsaw operators. While the total Baseline cut might be maintained in 2020, the species mix will be very different. Domestic demand for cheap wood will continue due to the acceptance by the domestic market of lower quality in place of higher quality timber. Under the Legitimate Timber Scenario there may be some downsizing in 2012 and probably more markedly in 2020, but illegal chainsaw operations will continue to operate on a significant scale due to their high profitability – they gain a gross margin of 57% according to the data collated in this study. Table 7 presents the Baseline aggregated (459,000 m³ output) and unit revenue and costs. This basic economic model did not change across the scenarios except for annual production. Under the Sector Reform Scenario the sector should be much smaller as most operators become legalised, and due to the capacity building, technical assistance and other support for community enterprises.

Table 7. Economic Model of Chainsaw Production

	Unit cost \$/m ³	Baseline revenue/cost \$000
Gross revenue	126.11	57,886
Costs:		
Labour	9.44	4,335
Informal payments	9.75	4,474
Fixed costs	6.42	2,948
Transport	46.14	21,180
Total Cost	34.17	15,684

Gross Margin

71.62

32,874

Since the Timber Resources Management Act (Act 547) of 1997 effectively prohibited the use of chainsaws to convert timber into products for sale, and the sale and purchase of chainsawn lumber, the domestic market has almost entirely been served by illegal chainsawn products. Because the system of resource allocation and benefit sharing does not recognise the role of farmers in nurturing trees on their farms, farmers find it more beneficial to collude with chainsaw operators to fell trees from their farms. Chainsaw lumber production also offers jobs to many community members as porters of the lumber produced. Attempts to enforce the ban have led to severe conflict situations, resulting in loss of property, limbs and lives.

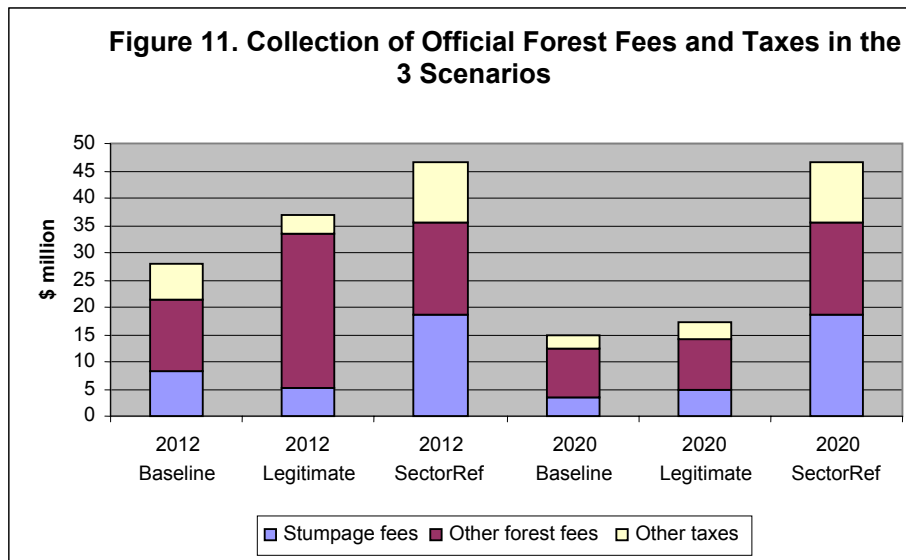
Proposals emerging from the VPA Domestic Market Regularisation Working Group, predicted and supported by this study, include the piloting and phasing in of the following measures:

- ❑ Register and control of all lumber brokers and sellers
- ❑ Timber markets (depots) should be established at regional, district and area levels to which lumber from legal sources can be supplied
- ❑ Associations of chainsaw operators and their lumber broker financiers helped to invest in mobile mills and to constitute themselves into teams initially linked to TUC holders and given access to un-harvested yield allocation and logging residues
- ❑ In subsequent phases, well-performing teams given access to enumerated off-reserve resources.

Alongside a phased approach to awareness, training and facilitation of information and business models for forest-linked sustainable small enterprise development for former chainsaw operators and associated workers, such a programme could be highly effective. These issues are further explored in the review of potential impacts in the informal sector - Annex 7.

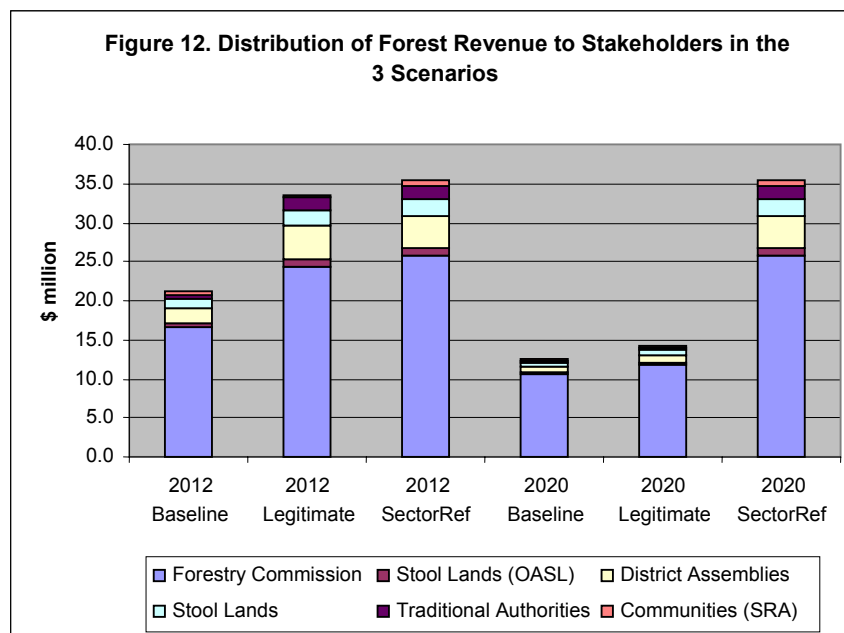
3.6 How much revenue will be collected and distributed?

Figure 11 shows how much forest revenue and other taxes would be collected in the three scenarios. This again shows how the Sector Reform Scenario, which includes fiscal reforms, would be far preferable to the other scenarios especially in 2020. Mainly due to the higher stumpage fees, the 2020 Sector Reform revenue is three times the Baseline Scenario and over twice the Legitimate Timber Scenario. In the 2005/2012 Baseline Scenario, stumpage fees averaged about \$7-8 per cubic metre of all (formal sector) harvested timber including the illegal cut. The weak fiscal policy component of the Legitimate Timber Scenario can be observed in the small contribution of stumpage fees to revenue in both 2012 and 2020. In the Sector Reform Scenario the stumpage fee per cubic metre doubles, due both to the reduction of illegal logging and an increase in stumpage fees to \$15 per cubic metre (weighted average). It is also assumed that in the Sector Reform Scenario there is a 3% TIIDD export levy compared to 2% in the other Scenarios.



It should be noted that the low level of 'other taxes' in the Baseline and Legitimate Timber Scenarios is due to the location of integrated companies in free trade areas. Very little corporate tax is paid. This situation is also assumed for the Sector Reform Scenario, but the much higher level of 'other taxes' in this Scenario is mainly due to the sale of tertiary products on the domestic market and the subsequent value-added tax. This adds about 12 million dollars to government revenue.

Figure 12 shows the distribution of forest revenue to the beneficiary stakeholders. The Forestry Commission is easily the main recipient, receiving 60% of Forest Reserve stumpage fees and 40% of Off-Reserve Stumpage fees, as well as the FC Export Levy, plantation revenue and other minor fees. The striking thing about this table is that revenue receiving stakeholders would be clear 'winners' under the Sector Reform Scenario.



In the case of forest communities, it is assumed they receive the statutory minimum 'Social Responsibility Agreement' (SRA) payment of 5% of stumpage fees. This is a minute fraction of

total revenue; even in the Sector Reform situation it comes to less than a million dollars, less than 0.02% of revenue distributed. Thus communities remain pecuniary losers in the Sector Reform Scenario, although for them the real benefits would be from retention or improvement of ecosystem services, NTFPs, coping strategies, spiritual and cultural values (including Sacred Groves), etc.

3.7 How will the ‘timber economic rent’ be distributed?

Table 8 present the distribution of the ‘timber economic rent’ from the formal sector harvest in the various scenarios. The ‘timber economic rent’ is the full economic timber value of the standing trees and forests; it is not the full economic rent of the forests since it does not include the NTFP, socio-spiritual, carbon or other ecosystem values of trees and forests. It is estimated on the basis of the market derived opportunity cost value of the timber – here it is assumed that 30% of the log volume could be sold on international markets and 70% on the domestic market. It is calculated net of forest management, harvest and transport costs and a normal profit margin (15%). This is the theoretical maximum price that an efficient processor would be prepared to pay for the standing trees.

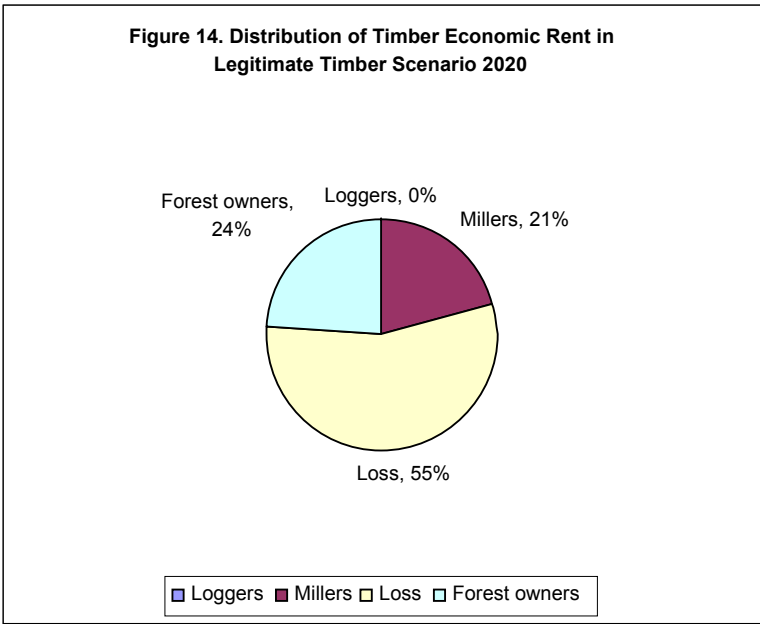
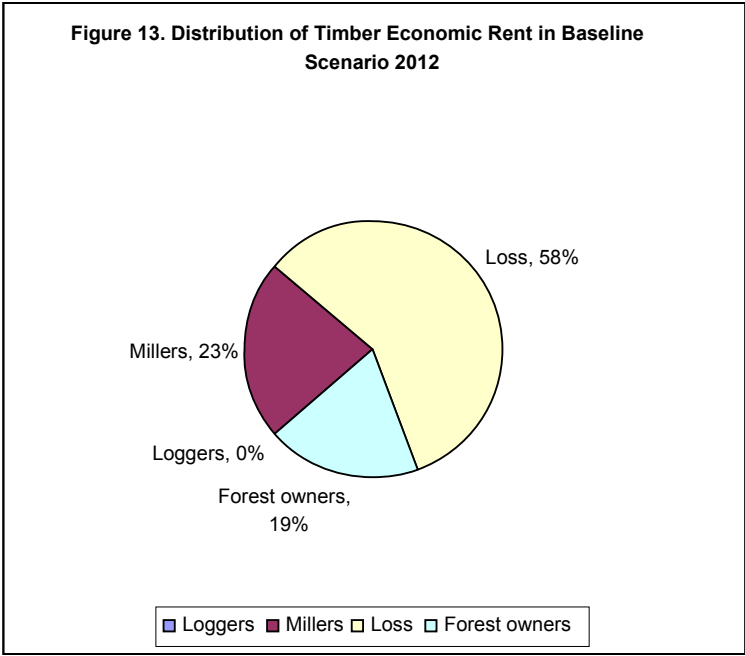
It can also be interpreted as the economic surplus or ‘windfall profit’ over normal profits. This surplus is available to be captured by a range of stakeholders. The timber rent can be divided between the resource owners (according to how much of it is collected and returned to them), loggers and millers in the form of excess profits, as well as losses or wastage, representing harvesting and processing inefficiency. The share of the rent going to millers and loggers represents a wealth transfer from the resource owners to the private sector.

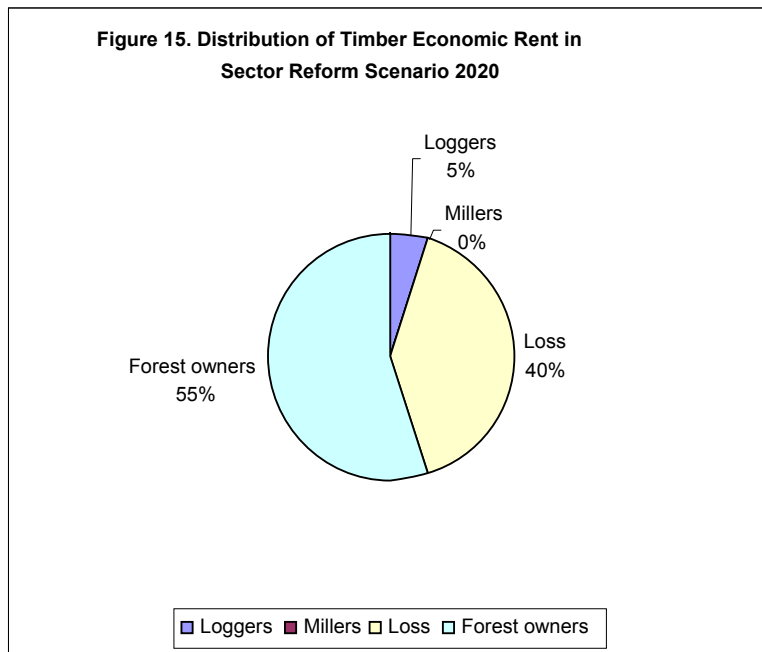
Table 8. ‘Timber Economic Rent’ and its Distribution

	2012	2012	2012	2020	2020	2020
Timber economic rent:	Baseline	Legit. Timber	Sector Reform	Baseline	Legit. Timber	Sector Reform
Total \$ million	70	30	40	18	21	40
\$ per m ³ RWE	45	42	47	37	35	47
% distribution:						
Loggers %	0%	2%	5%	0%	0%	5%
Millers %	23%	21%	0%	22%	21%	0%
Loss %	58%	55%	40%	55%	55%	40%
Forest owners %	19%	22%	55%	23%	24%	55%

Table 8 shows a sharp fall in the rent from the 2012 Baseline situation to the 2020 Baseline or Legitimate Timber Scenario, and to a lesser extent in the Sector Reform Strategy. In the Sector Reform Scenario, loggers receive some surplus rent due to an increase in domestic prices in line with import prices. Small-scale loggers get relatively more of the rent than larger integrated companies due to their lower fixed costs. This positive rent to loggers also indicates that there is further scope to increase stumpage fees. In this Scenario, millers are assumed to pay the full ‘willingness to pay’ value of the roundwood. This means they do not receive economic rent in contrast to the Baseline and Legitimate Timber Scenarios in which they are subsidised by the log export ban.

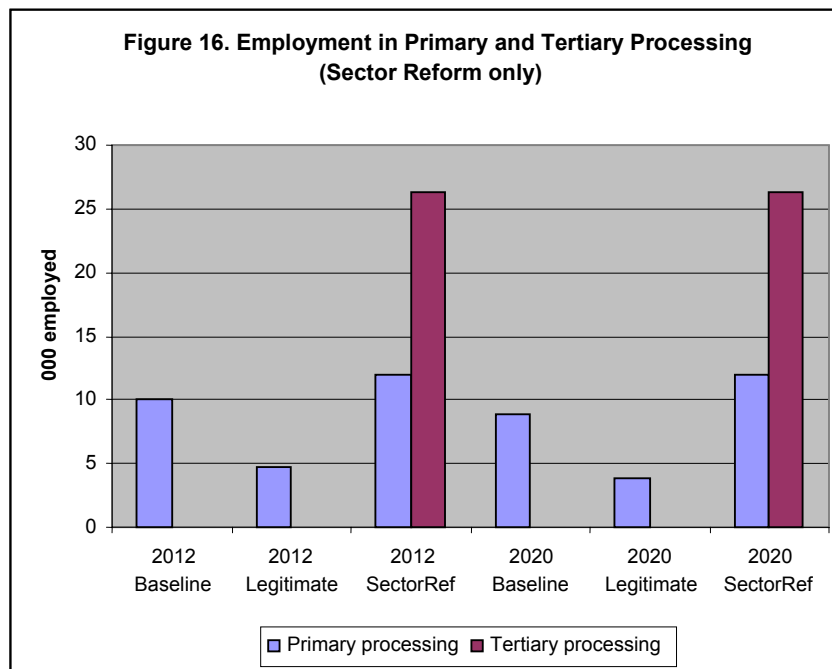
Figures 13, 14 and 15 show the distribution of the rent in the 2012 Baseline, the 2020 Legitimate Timber Scenario and the Sector Reform Scenario respectively. These show that the main winners in the Sector Reform Scenario are the forest owners. Instead of getting less than a quarter of the rent in the Baseline and Legitimate Timber Scenarios, they could get over half. This is a significant redistribution of wealth. It can also be seen that loss/wastage is very high - 55% in all situations except the Sector Reform Scenario – and even then it is 40%. This is because even in the Sector Reform Scenario ‘willingness to pay’ values have not improved significantly by 2020.



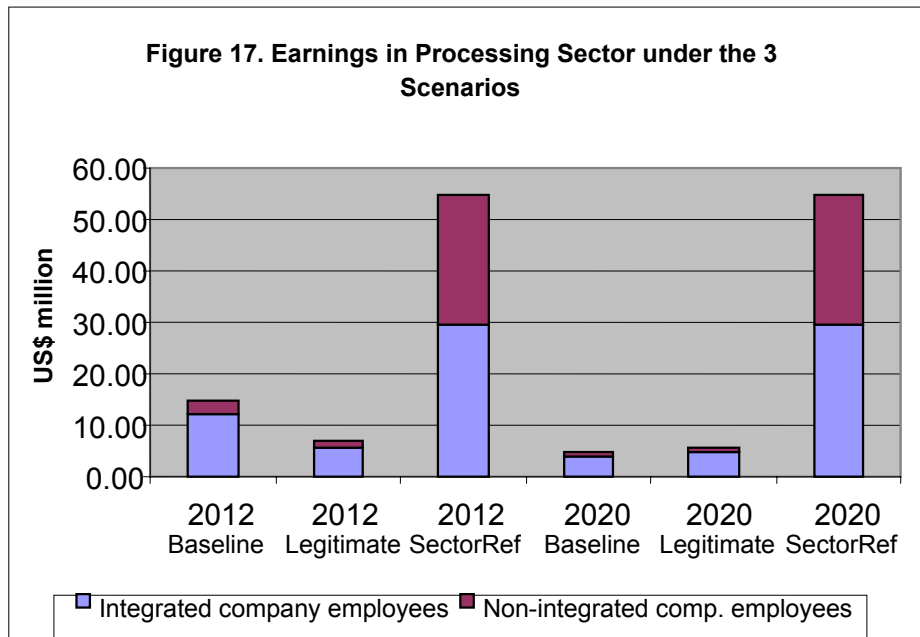


3.8 What will happen to employment?

Figure 16 shows the number of people employed in the primary processing sector, and for the Sector Reform Scenario only, the tertiary processing sector. Since tertiary sector employment is not shown for the Baseline and Legitimate Timber Scenarios (it would be much lower), it is not possible to make a complete comparison across the Scenarios. However the tertiary processing employment estimate indicates that again the Sector Reform Scenario is a clear winner for industrial sector employees, while the Legitimate Timber Scenario would be quite a hard landing in terms of redundancies.



Analysis of employee earnings (salaries and wages) in Figure 17 indicates that earnings in the Sector Reform Scenario could be over 10 times the 2020 Baseline level and over 9 times the 2020 Legitimate Timber Scenario. Were tertiary export sector earnings to be added, the comparison would be even more stark since this sector's salaries are 50-100% higher than the other market segments.



3.9 How will the timber industry contribute to the national economy?

Figure 18 shows the economic value-added of the primary processing and logging sectors to the economy. This Gross Domestic Product (GDP) contribution is the gross value of outputs less the real (or opportunity cost) value of the roundwood, other material inputs and non-factor costs. It can be observed that while the logging sector makes a positive value-added contribution to the national economy since it is not protected, the primary processing sector subtracts from GDP (negative value-added) due to the protected price regime (due to the log export ban) and inefficient conversion ratios. An effect of the Sector Reform strategy is to convert the primary processing industry from being a net drain on the national economy to making a positive contribution. This is due both to the improved conversion ratios and higher roundwood prices.

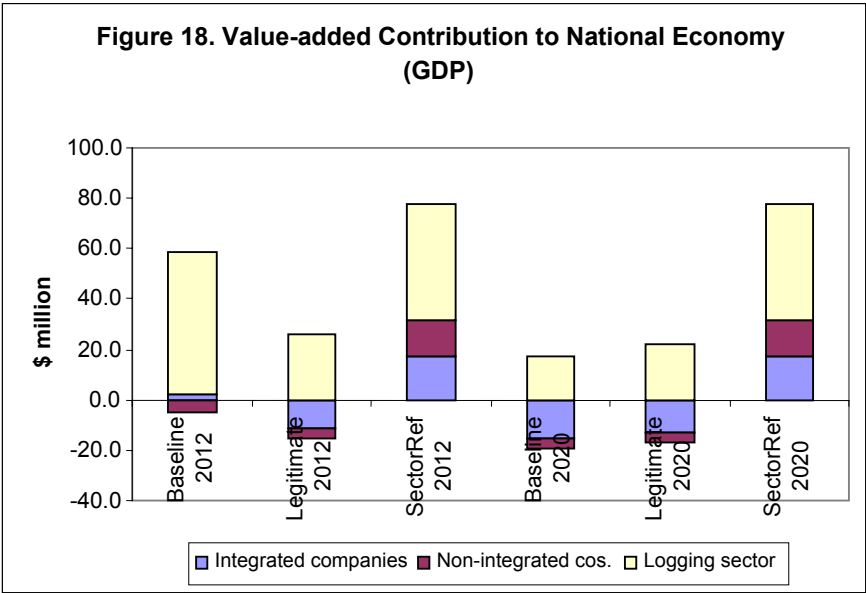
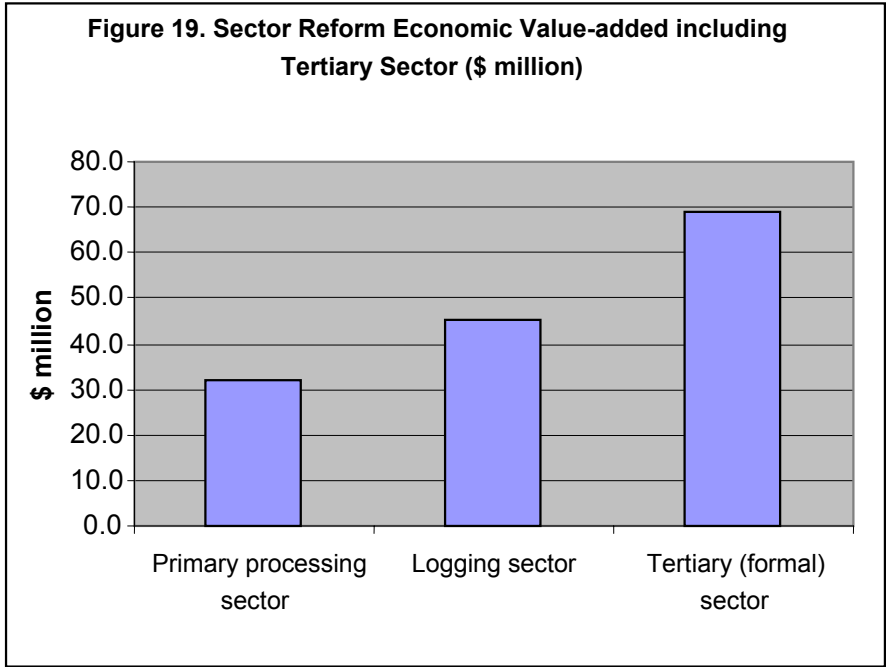


Figure 19 presents for the Sector Reform Scenario only the contribution of the tertiary sector to GDP in comparison with the primary processing and logging sectors. Were it possible to show tertiary sector value-addition for the other two scenarios, it would show the comparative superiority of the Sector Reform Scenario in terms of the contribution to GDP..



3.10 What will be the institutional cost?

It can be observed that the Forest Sector Master Plan includes most of the activities included in the Legitimate Timber Scenario. The total annual cost of the Sector Plan divided between the various forest sector institutions has been computed at about US \$34 million (MLF 1996). Table 9 summarises this cost in dollars.

Table 9. Forest Sector Plan Budget 2003-2008 (millions of dollars)

	2003 \$ million	2004 \$ million	2005 \$ million	2006 \$ million	2007 \$ million	2008 \$ million
Payroll	4.29	6.15	7.43	8.77	10.35	12.21
Administration	3.38	3.89	4.35	4.89	5.50	6.21
Services	2.71	3.12	3.59	4.12	4.74	5.45
Plantation development	0.69	0.81	0.95	1.13	1.33	1.57
Bad debt provision	0.71	1.20	1.32	1.44	1.56	1.68
Rehabilitation costs	0.14	0.72	0.68	0.67	0.67	0.67
Plantation development	0.00	0.00	5.56	5.56	5.56	5.56
Currently donor financed	0.00	0.00	0.56	0.56	0.56	0.56
Severance	0.00	0.00	11.11	0.00	0.00	0.00
Log Tracking	0.00	0.50	0.40	0.40	0.00	0.00
Total expenditure	11.91	16.38	35.94	27.53	30.26	33.90

To this must be added the cost of the Timber Validation Authority, computed at \$11.8 million spread over five years, as shown in Table 10. Detailed costs are presented in Annex 6.

Table 10. Costs of the Timber Validation Authority (US\$ million)

	2009 \$ million	2010 \$ million	2011 \$ million	2012 \$ million	2013 \$ million
Fixed costs	2.37	0.83	0.59	0.14	0.32
Recurrent costs	0.80	1.29	1.32	1.19	0.70
Technical Assistance costs	0.40	0.40	0.40	0.30	0.20
Sub-total	3.58	2.52	2.31	1.64	1.21
Contingency (5%)	0.18	0.13	0.12	0.08	0.06
Total TVA cost	3.76	2.64	2.42	1.72	1.27

From these figures, it is possible to construct a crude estimate of the possible total cost of the Legitimate Timber Scenario. This is attempted below in Table 11 for 2010, 2013 and 2020. For 2010, the 2005/2012 Baseline Scenario has been used for the estimates of the Forestry Commission share of forest fees and other taxes. Even if it were possible to persuade the Government to allow corporate and VAT to be returned to the forest sector, the deficit could be in the area of about \$20 million in 2020. This deficit would rise as the Legitimate Timber Scenario annual harvest declines as explained above.

Table 11. Indicative Estimate of Legitimate Timber Scenario Cost and Revenue Deficit (US\$ million)

	2010 \$ million	2013 \$ million	2020 \$ million
Legitimate Timber Scenario cost:			
TVA Recurrent cost	1.29	0.70	0.70
TVA Other costs	1.35	0.57	0
Forest Sector Plan cost	34.00	34.00	34.00
Total cost	36.64	35.27	34.70
Legitimate Timber Scenario revenue:			
FC share of Forest Fees	16.71	24.36	11.83
Other taxes	6.73	3.46	3.00
Total revenue	16.72	27.82	14.83

Legitimate Timber Scenario deficit -19.00 -6.88 -19.87

3.11 What will be the main impacts of each policy measure by 2020?

In Table 12 an attempt is made by the impact assessment team to draw on all the information reviewed and assess the potential impacts by 2020 of each of the policy measures proposed for introduction. These are the policy measures contained in the Legitimate Timber Scenario and the Sector Reform Scenario. An indication of the strength of the impact is given for each measure – from high to low positive or negative impact on the economy, industry, informal sector and rural communities, and the forest. A summary description of this impact is also given. An attempt is also made to identify which policy measures are ‘independent’, i.e. those that do not rely critically on other measures to have some effect (although most rely on other measures to have full effect). Such measures could be moved from the Legitimate Timber Scenario to the Sector Reform Scenario, or from Sector Reform Scenario to Legitimate Timber Scenario. In other words they can be added and taken away from a policy package. All other policy measures are ‘dependent’ – they need to be implemented as part of a package (in this case, with the other dependent measures in the scenario in which they appear)

Table 12. Summary assessment of potential impacts of each policy measure for the economy, stakeholders and the forest

Key to table:

- ▲ Low positive impact, ▲▲ Medium positive impact, ▲▲▲ High positive impact
- ▼ Low negative impact, ▼▼ Medium negative impact, ▼▼▼ High negative impact
- ♣ Independent policy measure – a measure that does not rely critically on other measures to have some effect (although most rely on other measures to have full effect). (See above discussion).

Policy measure	Main impacts on the economy	Main impacts on stakeholders		Main impacts on forest resources
		Industry	Informal sector & rural communities	
Baseline scenario - current situation projected into the future				
Parallel systems of timber rights allocation	▼▼▼ Under-priced timber. Low revenue to state	▲▲▲ Easy access to timber. Low pressure for legal compliance	▼▼ Systems subject to abuse. Low compliance with local rights	▼▼ Timber allocated in inappropriate sites and conditions - forest degradation
Log export ban and chainsaw logging ban	▼▼ Low domestic timber price. High costs of illegality and conflict with chainsaw operations	▲▲▲ Large industry protected. Proliferation of enterprises for domestic market	▼ Export ban increases timber in local market. Criminalised communities and resource conflicts	▼▼ Export ban increases pressure on the forest. Much illicit forest exploitation
High capacity and low value-addition in the wood industry	▼▼▼ Value subtraction. Low contributions to national wealth	▼▼▼ Competition for timber. Forest timber supply set to crash	▼▼▼ Short term, unsafe work in the industry. Low level of local benefit	▼▼▼ Elimination of high demand species. Wastage because value is low
Low economic rent capture	▼▼▼ Low levels of finance available for investment. Rent seeking	▲▲▲ High profitability. Low transaction costs	▼▼ Resource owners not receiving their dues. Low cooperation	▼▼ Few incentives for local management. State management under-resourced

	strategies by stakeholders		with industry and state	
Rural communities disenfranchised	▼▼▼ Low opportunities for local economic growth. Rural discontent growing	▲▼ Few local commitments. Some local conflicts	▼▼▼ Intra-local, industry-local and state-local conflicts. Declining forest-linked livelihoods	▼▼▼ Lack of interest in management. Perverse incentives for forest degradation
Modest plantation growth	▲▼ Small increase in revenues by 2020. High transaction costs	▲ Some new investors. Opportunities to align for future plantation-based industry	▲▼ Small increase in returns locally Disincentives for local involvement and some land use conflicts	▲▼ Some reduction in ecological values. Some pressure off the natural resource
Institutional stasis	▼▼ High transaction costs and poorly directed finance. High costs of corruption	▲▲ Comfortable low-cost arrangements to access the resource. Low levels of state scrutiny	▼▼▼ Local stakeholders treated with disdain. Cheaper to bribe than comply	▼▼ Weak management and regulation. Connivance of some staff in over-exploitation

Policy measure	Main impacts on the economy	Main impacts on stakeholders		Main impacts on forest resources
		Industry	Informal sector & rural communities	
Legitimate timber scenario – legality assurance for export and domestic markets				
Legal standard	▲ Increased confidence for economic decisions in the sector	▲▼ Challenge to industry reliant on illegal supply. Boost to industry sourcing legally	▲ Clarity of rights and responsibilities. Improved credibility and safeguards in forest use	▲ Basis for controlled timber extraction and protection of ecosystem services
Chain of custody system	▲▼ High institutional costs of installing the system. Sector credibility strengthened	▼▼ Higher transaction costs for industry. Illegal industry begins to decline – legal operators begin to benefit	▲▼ New stakeholder roles. Risk of pushing chainsaw operators further into criminality	▲▲ Proof of legal origin reduces pressure on the forest resource
Verification of legality system	▲ Secure, transparent but lower revenues	▼▼ Industry begins to restructure as those previously reliant on illegal supply adapt	▲▲ Increased accountability and institutional clarity.	▲▲ Improved procedures and management – benefiting all forest values
Piloting the above legal assurance system	▲▼ Cost of pilots. Way forward clarified for planning	▲▼ Compliance costs. Industry involved in pilots gain advantage	▲▲ Stakeholders engaged and capability built	▲▲ Forests in pilots better managed
Independent monitoring ♣	▲ Transparency and confidence in the sector	▼ Transaction costs. Further marginalizes illegal operators	▲▲ Improved credibility. Further marginalizes rent-seekers	▲▲ Enhances legitimate forest management
Recognised chainsaw/mobile	▲ Increased timber	▼▼ Removal of illegal	▲▲ Improved	▲ Perhaps 20%

mill groups within districts	scarcity in local market increases prices. Improved pilot district revenues	supplies to industry from involved districts	transparency and collaboration. Possible conflicts between groups in and out of pilots	reduction in informal cut
Off-reserve enumeration, allocations and spot checks	▲ Institutional costs of the system. Improved information base	▼ Further pressure on illegal supplies from off-reserve areas	▲ Improved equity in revenue distribution. Illegal operators under pressure	▲ Improved knowledge of off-reserve resource. Some resource management
Domestic market monitoring ♣	▲ Improved transparency and information for planning	▲▼ Better intelligence and further scrutiny of domestic market	▲ Improved accountability. Further pressure on illegal operators	▲ Supports improved management
Collaboration with export market monitoring ♣	▲ Improved economic intelligence. Improved trade collaboration prospects	▲▼ Improved knowledge about markets for exporters. Improved scrutiny of trade flows	▲ Identifies niche export markets. Reduces opportunities for cross-border smuggling	▲ Reinforces improved management
Public procurement policy ♣	▲▲ Improved allocation of financial resources. Complex price and incentive impacts	▲ Major incentive for legal operations, to supply the 50% of the market that government provides. Perverse incentives for illegality in non-government market	▲ Possible parallel market – non-government buyers all buying illegal. Opportunities for corruption of officials	▲▲ Further stimulus to improved management
Public disclosure	▲▼ Confidence of economic decisions. Institutional costs of disclosure	▼ Transaction costs and increased civil society scrutiny	▲▲ Accountability Transparency breeds capacity in the sector	▲ Local accountability – with direct positive effect on management
Awareness campaign	▲ Institutional costs. Improved public support in sector	▲ Better public relations	▲▲ Confidence and capability to act on rights and responsibilities	▲ Reinforces improved management
Facilitated stakeholder engagement ♣	▲ Improved mechanisms for economic planning	▲ Improved understanding with stakeholders	▲▲ Engagement in policy (previously marginalized)	▲ Reinforces improved management
Mitigation of some key negative impacts ♣	▲ Safety net measures installed in poverty reduction strategy	▲ Re-tooling and re-training stimulated. Information and guidance provision for affected industry	▲▲ Retraining and alternatives to reduced livelihoods identified	▲ Reduces pressure on resource from those previously employed in illegal operations
Capacity building (for above policy measures)	▲ Institutional costs. State capacity	▲ Improved understanding and capability to take	▲▲ Preparedness to take up new opportunities, collaborate with new	▲▲ Provides drive for improved management

	gains to run new systems	new opportunities	systems and meet responsibilities	
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Policy measure	Main impacts on the economy	Main impacts on stakeholders		Main impacts on forest resources
		Industry	Informal sector & rural communities	
Sector reform scenario – transition to improved forest governance				
Increased stumpage fees, competitive bidding, effective revenue collection ♣	▲▲▲ Increased revenue despite decreased resource. Improved pricing of resources	▲ Efficient industry gains through competitive bidding and (potentially) log export quotas	▲▲ Improved accountability and revenue flows to stakeholders	▲▲▲ More control over the timber permits
Catalysed industry capacity reduction ♣	▲▲ Sector more in balance with the resource	▲▼ Costs for the remaining industry. Benefits to those exiting the industry	▲ Fewer companies disregarding local rights and agreements	▲▲▲ Reduction in over-exploitation
Incentives for downstream processing	▲▲ Transaction costs setting up incentives. More economic value in the sector	▲▲▲ Increased value addition in remaining industry	▲▲ More employment opportunities in some locations	▲ More value addition supporting more responsible forest use
Enabling framework for investment in plantations ♣	▲▲▲ New plantation investors attracted. Improved resource base for the sector	▲▲▲ Industry geared more to plantation resource. New investors in the industry	▲▲ Livelihood opportunities with out-grower and joint venture schemes. Some livelihoods displaced	▲▲ New plantation resources, and reduced pressure on remaining natural forest. Possible ecological losses
Facilitated investment in small enterprise ♣	▲▲ Costs of facilitation. Creation of a vibrant, viable and responsible forest sector	▲▲ Re-oriented sector towards responsible small enterprises (and well-focused large ones)	▲▲▲ Small scale timber and non-timber enterprise benefits locally controlled. Local economy multiplier benefits	▲▲ Better management where enterprise linked to strong community institutions
Regularised chainsaw/mobile mill lumber trade	▲▲▲ Chainsaw sub-sector under greater control	▲▲ End of industry reliant on illegal timber	▲▲▲ About 20% of former chainsaw operators organized and accountable. Local institutions driving responsibility	▲▲▲ Accountable off-reserve management
Penalties updated and justice system upgraded	▲▲▲ Greater legal compliance in the sector	▲ Legitimate rights holders supported	▲▲ Local rights backed up with effective sanctions	▲▲▲ Reinforces responsible management
From forest benefits to forest rights - including farmer tree tenure	▲▲ Reduced costs as ultimate resource owners finally gain	▲ Phase out of permits off reserve. Partnerships with communities/local	▲▲▲ Resource owners gain control of forest benefits (and costs).	▲▲▲ Management in the hands of the owners

	control	enterprises	Community control of off-reserve resource.	
Stakeholder decision-making	▲▲ Mutual accountability in the sector	▲▲ Partnerships and understanding	▲▲▲ Joint decision-making with other stakeholders	▲▲▲ Increased accountability of management
Regional cooperation ♣	▲▲▲ Improvement in trade terms. Legitimate timber regime secured	▲▲ Improved legitimate import and export prospects.	▲ Some employment from improved investment. Reduced cross-border illegality	▲▲ Reduced cross-border resource crime
Capacity building (for above policy measures)	▲▲▲ Re-shaped sector fit for purpose	▲ Lower transaction costs and resource wastage	▲▲▲ Improved forest management capabilities	▲▲▲ Management in more capable, less wasteful, hands

The above table helps understanding of what is likely to happen if business continues as usual - a few big winners in industry and government institutions keeping the many losers in their place, while contributions to the national economic dwindle to very low levels and the forest resource crashes. It also indicates that the policy measures suggested in the Legitimate Timber Scenario are generally modest in their power to soften this hard landing – they would create a generally positive but fragile improvement. It is only with the addition of measures in the Sector Reform Scenario that the bigger wins for the economy, the majority of stakeholders and the forests are likely to be seen.

This suggests that certain measures from the Sector Reform Scenario will need to be brought in to an effective package in a VPA such that substantial positive change is actually brought about. The assessment of independent and dependent policy measures also assists in identifying which policy measures should be implemented together and which immediately as opposed to being phased in later – see section 5.

In a questionnaire survey in this study which solicited some 50 responses from industry workers, local NGOs, international NGOs, farmers, and resource user groups, the following policy measures were ranked the most desirable for immediate implementation:

1. Increased stumpage fees, competitive bidding, effective revenue collection
2. Legal standard
3. Verification of legality system
4. Recognised chainsaw/mobile mill groups within districts
5. Awareness campaign
6. From forest benefits to forest rights - including farmer tree tenure
7. Public disclosure
8. Independent monitoring

This ‘top 8’ list of measures from the perspective of some ‘social’ stakeholders is helpful in suggesting a VPA package which is likely to find favour locally – see section 5. These stakeholder views are explored in more depth in the review of local and rural stakeholder issues and perspectives – Annex 8.

4. Currently uncertain developments which could greatly modify the findings

4.1 Shifts in wood sources

Several trends emerging which are likely to have substantial effect in the forest sector in Ghana, but are very difficult as yet to predict and model, include:

- ❑ **Importation of round wood.** Importation of logs implies introduction of international competition into the domestic market. Importation of round logs could offset some of the adverse impacts of policy measures in the Legitimate Timber and Sector Reform scenarios. In the models informing this report the impact assessment team has considered assumptions including: importation of round logs at an estimated volume; higher domestic log prices to reflect the import price equivalent; existence of tertiary sector capacity and conditions for competitively purchasing domestic inputs; and improved “re-tooling” in primary and secondary processing through positive adjustments in technical efficiency coefficients.
- ❑ **Plantation development.** To explore plantation development the impact assessment team in this report has considered assumptions including: an estimated level of plantation revenue; that the production chain of plantation timber will come under the VPA and that the cost of achieving legality will be incorporated in overall Forestry Commission institutional costs.
- ❑ **Logging submerged timber.** A proposal is under negotiation for a \$50 million investment to harvest significant resources of submerged timber from some 350,000 ha of Lake Volta over 15-20 years (CSRD, 2007). Although recognizing that this potential development may lead to a substantial change in the timber export situation – the impact assessment team has not factored this in to calculations because of the major uncertainties and challenges inherent in this proposal.

Thus the impact assessment team has taken a view and made some assumptions on each of these emerging trends. It should be recognized that alternative assumptions would substantially affect the findings in this study.

4.2 Finance for Reduced Emissions from Deforestation and forest Degradation

Given the revenue deficit identified under the Legitimate Timber Scenario it was considered worth undertaking a preliminary estimate of the possible revenue from a national Reduced Emissions from Deforestation and forest Degradation (REDD) strategy. This is based on the following observations:

- ❑ Ghana has applied to the World Bank Forest Carbon Partnership Facility for financial support for the development of a national REDD ‘Readiness’ Programme
- ❑ Improved forest governance and policies would be central to any government REDD policy – most of the policies required for the Legitimate Timber Scenario, and especially for the Sector Reform Scenario, would also be key to the success of a REDD programme
- ❑ Although a post-Kyoto REDD mechanism is yet to be decided, there is strong political will behind it in view of the seriousness of carbon emissions from deforestation, giving rise to the possibility of REDD carbon payments over the 2013-2017 period
- ❑ Ghana has one of the highest rates of deforestation in Africa (1.9% over the 2000-2005 period) so that it is also a potentially important REDD beneficiary
- ❑ As far as the team is aware there has been no previous attempt to work out the potential gross and net payments from a national REDD programme

An important caveat is that at this stage it is not clear if an SFM regime in Ghana would qualify for REDD payments. For example, it would need to be proven that SFM is not economically viable without REDD payments. Otherwise there would be no “additionality” for buyers of REDD credits. It is also important to note that there are still major hurdles to overcome in the design of an

international REDD mechanism, and it is still not very clear what it will look like. Depending on decisions to be made in the United Nations Framework Convention for Climate Change (UNFCCC) during the next few years, the financial benefits of REDD to Ghana could look very different to those provisionally estimated here.

Notwithstanding these caveats, an indicative estimate has been made of possible gross and net REDD payments from reducing deforestation by 20% or 50%. A 20% reduction in the deforestation rate may be achievable through the Legitimate Timber Scenario, but a 50% reduction would certainly require the more comprehensive Sector Reform Scenario. Annex 6 presents the main assumptions and steps needed to make the calculation, and a more detailed calculation.

Table 13 summarises the estimated Net REDD payments at two points of time – 2017 and 2030. 2017 is the end of the next Kyoto accounting period and so would be the earliest Ghana would receive carbon payments; 2030 is arbitrarily selected as a convenient future point in time. The estimates are presented firstly as an undiscounted cumulative figure at the two time points, and secondly as a discounted net present value (NPV) using a 10% discount rate. There are many variables in a REDD calculation – these estimates allow for variability in the net carbon dioxide retention (or avoided deforestation) of Ghana’s forests against alternative land uses, in the price of carbon and in the costs of a REDD programme, as follows:

- A lower and upper estimate of net avoided deforestation carbon emissions of 300 and 420 tonnes of carbon dioxide equivalent (tCO₂e) per hectare
- A lower (\$10 per tCO₂e) and more optimistic (\$20 per tCO₂e) price of carbon
- A lower and upper estimate of the costs of a REDD programme, which comprise the start-up or ‘Readiness’ costs, annual carbon monitoring costs, the opportunity cost of land use payment to landholders or forest managers and transaction or administrative costs of making these payments
- Gross REDD payments reduced or ‘discounted’ by 20% to allow for ‘leakage’ (10%) and risk or impermanence (10%) in line with international good practice (VCS AFOLU Advisory Group, 2007; Jacob Olander, personal communication).

Table 13. Estimated Net REDD Payments (millions of US dollars)

	\$10 per tCO ₂ e		\$20 per tCO ₂ e	
	300 t/ha	420 t/ha	300 t/ha	420 t/ha
A. UNDISCOUNTED				
20% lower deforestation rate	\$ million	\$ million	\$ million	\$ million
2017 (cumulative)				
Upper bound cost estimate	123	220	365	558
Lower bound cost estimate	152	249	394	587
2030 (cumulative)				
Upper bound cost estimate	33	277	644	1,133
Lower bound cost estimate	259	504	870	1,359
50% lower deforestation rate				
2017				
Upper bound cost estimate	406	651	1,018	1,508
Lower bound cost estimate	479	724	1,092	1,581
2030				
Upper bound cost estimate	314	958	1,924	3,213
Lower bound cost estimate	900	1,544	2,511	3,799
B. NET PRESENT VALUE (10% Discount Rate)				
FROM 2009				
20% lower deforestation rate				
2017 (cumulative)				
Upper bound cost estimate	62	116	195	302
Lower bound cost estimate	77	130	210	316

2030 (cumulative)				
Upper bound cost estimate	53	142	276	455
Lower bound cost estimate	110	199	333	511
50% lower deforestation rate				
2017 (cumulative)				
Upper bound cost estimate	222	356	558	828
Lower bound cost estimate	259	393	595	865
2030 (cumulative)				
Upper bound cost estimate	230	461	807	1,269
Lower bound cost estimate	375	606	953	1,415

According to these estimates, assuming a 20% reduction in deforestation, the government could receive an NPV (base year 2009 and 10% discount rate) of some 60-300 million dollars to the point of the first REDD payment in 2017 and 50-500 million dollars to 2030. With a 50% reduction in deforestation, the NPV over 2009-2017 could be 200-800 million dollars, and over 2009 - 2030 between 200 million and 1.4 billion dollars. For comparison, the Present Value (10% discount rate) of the cost of the Legitimate Timber Scenario 2009-2017 is estimated at 217 million dollars, and from 2009-2030 at 330 million dollars.

The cumulative undiscounted net revenue can also be expressed as an annual average. For 2017, annual average net REDD revenue works out at \$14-65 million assuming a 20% reduction in deforestation and \$45-176 million assuming a 50% reduction in deforestation. For 2030, the annual average is \$17-65 million for a 20% reduction in deforestation and \$35-422 for a 50% reduction in deforestation. Therefore, even if the reduction in the deforestation rate is 'only' 20% this should generate sufficient REDD revenue to cover the deficit. However, there are many uncertainties in these estimates!

5. Conclusions and recommendations

Conclusions. Protagonists in the forest sector Ghana should be under no illusions that pursuing a VPA will be either an easy ride or an easy answer to the problems of Ghana's forests. It will not be. It will be both expensive and relatively marginal in terms of the benefits that it brings and the forest resource that it saves. We conclude that:

1. With a legitimate timber regime developed through a VPA process Ghana is better off than without one
2. Domestic and export markets are interdependent, so measures to address both must be pursued concertedly, creatively and simultaneously - and can be phased through a VPA process
3. A legitimate timber regime will make Ghana more able to bring about forest sector reform – it is an important stepping stone
4. But even with a legitimate timber regime: the forest resource will be substantially degraded, forest industry will make a smaller contributor to the economy and communities will remain with no interest in forest management – a VPA is not enough
5. A VPA process should ensure that it stimulates and supports further bold measures for a sector re-shaped to achieve the vision of good forest governance – for improved sustainability and livelihoods

Tables 14 and 15 below summarise conclusions about the potential impacts in Ghana of a VPA for stakeholders and the forest.

Table 14. What will be the main impacts on stakeholder groups by 2020?

Stakeholders	Baseline	Legitimate timber	Sector reform
Large-medium scale tertiary enterprises	Decline in enterprises and GDP contribution with reduced wood supply	Reduction in enterprises with lower but stable wood supply	Improved value added, jobs and contributions to GDP
Rotary veneer mills	Steep decline. Turnover: integrated US\$ 13 million down to US\$ 4 million; non-integrated US\$ 4 million down to US\$ 1 million	Decline. Turnover: integrated down to US\$ 5 million; non-integrated down to US\$ 2 million	Improved. Turnover: integrated up to US\$ 20 million; non-integrated up to US\$ 7 million
Plywood mills	Steep decline. Turnover: integrated US\$ 21 million down to US\$ 6 million; non-integrated US\$ 4 million down to US\$ 1 million	Steep decline. Turnover: integrated down to US\$ 8 million; non-integrated down to US\$ 1 million	Improved: integrated up to US\$ 36 million; non-integrated up to US\$ 6 million
Sliced veneer mills	Steep decline. Turnover: integrated US\$ 36 million down to 11 million; non-integrated US\$ 2 million down to 1 million	Decline. Turnover: integrated down to US\$ 14 million; non-integrated down to US\$ 1 million	Improved. Turnover: integrated up to US\$ 74 million; non-integrated up to US\$ 4 million
Saw mills	Steep decline. Turnover: integrated US\$ 92 million down to US\$ 28 million; non-integrated US\$ 23 million down to US\$ 7 million	Steep decline. Turnover: integrated down to US\$ 36 million; non-integrated down to US\$ 9 million	Decline in integrated – turnover down to US\$ 30 million. Improved non-integrated – turnover up to US\$ 30 million
Integrated logger-processors	Steep decline. Turnover from current US\$ 24 million down to US\$ 13 million	Decline. Turnover down to US\$ 15 million	Stable. Turnover up to US\$ 29 million
Independent (un-integrated) loggers	Drastic decline. Turnover from current US\$ 32 million down to US\$ 5 million	Steep decline. Turnover down to US\$ 7 million	Reduced but stable. Turnover down to US\$ 16 million
Employees of timber companies	Loss of jobs and livelihood	Safety net measures and retraining equips some redundant staff	Better value-added jobs and small enterprise investments for former employees
Chainsaw operators	High level conflict; unsafe working situations; insecurity	Loss of livelihoods for more than half of those currently involved in the chainsaw lumber business. Re-skilling, re-orientation and regularisation of others	Stable, smaller chainsaw and mobile mill lumber sector, with growing small forest-linked value added enterprise sector
Trade hands and porters	Some employment with no long term job security	Some livelihoods lost or shifted, others re-aligned in regularized chainsaw/mobile mill groups	Redeployment in mobile mill lumber sector and growing small enterprises
Timber wholesalers and retailers	Wood supply through informal sources; promoting informal harvesting; promoting corruption	More restricted supply; some shift into other products; investment in mobile mills	Lower but stable wood supply from legal traders
Small scale tertiary and artisans	Wood supply through informal sources; no guarantee of future supply	Restricted but stable wood supply. Some squeezed out; fewer producers	Fewer enterprises producing legally, from sustainable sources
Civil society organizations	Engagement in advocacy and protest	Engagement in collaboration and guidance	Engagement and partnership in facilitating

			forest management
Farmers/Forest Fringe Communities	Disenfranchised from forest resources and dealing with illegal operators	More respect from timber exploiters and reduced deals with illegal operators	Improved benefits and involvement in off-reserve tree management
Traditional authorities	Declining revenue from forest resources	Stabilised revenues from forest resources	Increased involvement in resource management and decision making; stabilised revenues from forest resources
Central and local government agencies	Reduced revenue to agencies	Stabilized revenues from forest resources	Increased involvement in forest management
Forestry Commission	Capacity and credibility for forest resource management reduced	Increased legitimacy and effectiveness of operations with reduced revenue	Accountable and effective oversight of forest management with stable revenue

Table 15. What will be the main impacts on forest resources - under the three scenarios?

Forest resources	Baseline	Legitimate timber	Sector reform
Timber	<ul style="list-style-type: none"> ❑ Drop in overall harvest from 3.3 million m³ today (and in 2012) to 2.2 million m³ by 2020 ❑ Elimination of high demand species, sharp drop in moderate demand species and big increase in low demand species by 2020 	<ul style="list-style-type: none"> ❑ From 2.1 million m³ in 2012 to 1.5 million m³ in 2020. ❑ Elimination of high demand species, sharp drop in moderate demand species and some increase in low demand species by 2020 	<ul style="list-style-type: none"> ❑ Attaining 0.8 million m³, the estimated sustainable cut, in 2012, and retaining it to 2020 ❑ Sharp drop in all species types to 2012 and stabilizes by 2020 with slightly higher proportion of moderate demand species
NTFPs	<ul style="list-style-type: none"> ❑ High collateral damage to some NTFPs ❑ Increasing pressure on NTFPs, especially woody ones (especially fuelwood and charcoal) 	<ul style="list-style-type: none"> ❑ Less collateral damage to NTFPs ❑ Demand for woody NTFPs especially continues to grow 	<ul style="list-style-type: none"> ❑ Improved on and off-reserve management including NTFPs ❑ Improved local institutional control and responsible NTFP businesses
Ecosystem services	<ul style="list-style-type: none"> ❑ Some watershed degradation, biodiversity loss (e.g. harvesting in protected areas), and abuse of cultural values of forests (sacred groves) with continuing 2% p.a. deforestation ❑ Carbon emissions reportedly 5700 GtCO₂e from deforestation constituting 40% of total emissions in Ghana (1994) 	<ul style="list-style-type: none"> ❑ Ecosystem service degradation reduced ❑ Legitimate timber governance improvements prove sound basis for national strategy for reduced emissions from deforestation and degradation (REDD) 	<ul style="list-style-type: none"> ❑ With increased community control, management emphasis on watershed, cultural and biodiversity improved ❑ Ability of national and local institutions to collaborate on biodiversity protection and carbon storage improved

Table 16 summarises the overall gains and losses for Ghana – in economic, environmental and social terms - of continuing as usual, of installing a legitimate timber regime and of pursuing full sector reform.

Table 16. Summary gains and losses for Ghana by 2020

	Gains	Losses
Without a legitimate timber regime attempted	<ul style="list-style-type: none"> ❑ Short term profit for some existing industry ❑ Short term benefits for some from chainsaw lumbering ❑ Short-term employment benefits in forest industry 	<ul style="list-style-type: none"> ❑ 'Hard landing' as sector dwindles fast, corruption rife ❑ Resource crash, deforestation and degraded ecosystem services: foregone carbon payments; soil erosion and water quality problems; and loss of biodiversity ❑ Marginalised communities, rampant illegality, conflict and local governance problems
With an effective legitimate timber regime	<ul style="list-style-type: none"> ❑ 'Softer landing' for a downsized sector ❑ Improved formal sector resource management ❑ Increased accountability stimulates positive engagement 	<ul style="list-style-type: none"> ❑ Lower revenues, continued social / environmental risk ❑ Some species loss and forest degradation ❑ Communities still disenfranchised and some social dislocation ❑ Substantial numbers of companies dissolved with employment losses
With sector reform	<ul style="list-style-type: none"> ❑ Stabilised productive forest sector, healthy revenues ❑ Responsible management on and off reserve with maintenance of ecosystem services resulting in carbon storage, watershed and biodiversity protection ❑ Rights, responsibilities and capacity in the best places for good management and local benefit ❑ Larger share of 'timber economic rent' to resource owners 	<ul style="list-style-type: none"> ❑ Smaller forest sector ❑ Still lower levels of forest goods and services (may regenerate / expand beyond 2020) ❑ Lower (but sustainable) employment levels ❑ Despite gains – it is too little and too late for some communities

Recommendations. The Government of Ghana should press ahead with negotiating a VPA and should ensure that the agreement triggers an effective process capable of achieving major and lasting gains in forest governance. In the light of the assessment of potential impacts above it is possible to make suggestions about the most prudent packages of policy measures to pursue. Some of these policy measures will themselves mitigate the negative impacts of others. All of these policy measures are discussed earlier in this report:

- ❑ **Upon signing a VPA** we recommend that the following policy measures are initiated, with pilot programmes developed, then workable systems rolled out:
 10. Legal standard
 11. Chain of custody system
 12. Verification of legality system
 13. Increased stumpage fees, competitive bidding and effective revenue collection
 14. Penalties updated and justice system upgraded
 15. Public disclosure
 16. Awareness campaign
 17. Facilitated stakeholder engagement
 18. Capacity building (for above policy measures)
- ❑ **Within two years** we recommend that the following policy measures are initiated, with pilot programmes developed, then workable systems rolled out:
 25. Independent monitoring
 26. Regularised chainsaw/mobile mill groups within districts
 27. Off-reserve enumeration, allocations and spot checks
 28. Collaboration with export market monitoring
 29. Public procurement policy

30. Mitigation of some key negative impacts
 31. Catalysed industry capacity reduction
 32. Incentives for downstream processing
 33. From forest benefits to forest rights - including farmer tree tenure
 34. Stakeholder decision-making
- **Within four years** we recommend that the following policy measures are initiated, with pilot programmes developed, then workable systems rolled out:
35. Domestic market monitoring
 36. Enabling framework for investment in plantations
 37. Facilitated investment in small enterprise
 38. Regional cooperation
 39. Capacity building (for above policy measures)

Suggested next steps. The VPA process represents an opportunity to move forward with reforms in the forest sector in Ghana that have been pressing for many years – and should be grasped. Using the above analysis of potential impacts of broad approaches and specific policy measures, and the above indications of priority and phasing, it is recommended that the Government of Ghana develop its plan for discussion with the EC. The detailed proposals expected from the VPA Working Groups and the means to continue and deepen the stakeholder engagement developed in the VPA process to date should be installed in this plan, as should extension of this impact assessment work to provide a detailed baseline and ongoing progress tracking for the VPA process. It is strongly recommended that the Government of Ghana and the EC then reach an agreement which explicitly combines high-level political commitment, careful phasing, substantial resources and practical institutional capability to put Ghana on the road to good forest governance.