

LOGGING MANUAL

LOGGING AND TIMBER HARVESTING STANDARDS FOR GHANA

**FORESTRY COMMISSION, GHANA
NOVEMBER, 2024**

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ACRONYMS

CE	-	Chief Executive
CEP	-	Compartment Entry Permit
DM	-	District Manager
ED	-	Executive Director
FC	-	Forestry Commission
FFC	-	Forest Fringe Communities
FSD	-	Forest Services Division
FWP	-	Forest and Wildlife Policy
GhLAS	-	Ghana Legality Assurance System
GSBAs	-	Globally Significant Biodiversity Areas
L.I	-	Legislative Instrument
MoPs	-	Manuals of Procedures
NTFP	-	Non-Timber Forest Products
OFR	-	Outside Forest Reserves
PLMCC	-	Plantation Log Measurement Conveyance Certificate
RIL	-	Reduced Impact Logging
RM	-	Regional Manager
RMSC	-	Resource Management Support Centre
SRA	-	Social Responsibility Agreement
TOS	-	Timber Operational Specifications
TUC	-	Timber Utilization Contract

PREFACE

The purpose of this Logging Manual is to prescribe a code of timber harvesting practice to which the Forestry Commission (FC) requires all holders of timber harvesting rights to adhere to. The Manual is to provide guidance and information on the planning and operational aspects of logging and timber harvesting in natural and planted forests in Ghana.

This manual will be used by Forest Services Division (FSD) staff in conjunction with other Forestry Commission's Manuals of Procedures (MoPs) in the execution of their field supervisory and monitoring operations.

The introduction of Competitive Bidding as part of the Timber Utilization Contract (TUC) process and the key developments in the forestry sector facilitated the review of the existing logging manual to reflect current operations. The key developments include the Ghana Legality Assurance System (GhLAS) which is central to the Voluntary Partnership Agreement with key elements such as the Wood Tracking and Decision Support System.

The increasing importance of plantation timber and provisions contained in the Timber Resource Management and Legality Licensing Regulations, 2017 (L.I 2254) as well as contemporary international best practices such as Forest Certification and Reduced Impact Logging also informed the revision of the existing logging manual.

In addition, the Board of Commissioners' of the Forestry Commission (FC) approved of a new yield regulation which has brought changes in harvesting control measures such as a review of the felling cycle amongst others, and therefore the need to revise the logging manual to reflect these changes.

SECTION ONE - PLANNING FOR LOGGING AND HARVESTING OF TIMBER WITHIN FOREST RESERVES

1.0 Introduction

1. This section considers planning for logging and harvesting of timber within forest reserves.
2. All logging and harvesting operations in forest reserves must be properly planned. Planning for timber harvesting takes place at two levels; strategic and operational. Strategic planning is the responsibility of the Forestry Commission. Some aspects of the operational planning fall under the remit of the loggers and are therefore described here in more detail.

1.1 Forest Planning

1. Strategic planning is carried out by the Forest Services Division (FSD) for the forest reserves in order to identify areas that are suitable for timber production; and to separately identify those areas that must be provided with some degree of protection or set aside for enrichment planting or forest plantation development. This is done through the production of Forest Reserve Management Plans.
2. Forest reserves will be managed to preserve environmental quality as well as sustainable production of forest produce. The FSD in collaboration with Resource Management Support Centre (RMSC) will consider the condition of the forest and the different functions it must serve before delineating those areas suitable for timber production.
3. Timber Utilisation Contract/Permit Areas are identified by the FSD within reserves comprising a compartment, parts of a reserve, a whole reserve or indeed a group of reserves, in such a way that there is an adequate volume of timber available each year within the restrictions set for yield control. However, in the case of plantations, sub-compartments could be identified for harvesting.
4. As part of the process of awarding and managing the implementation of the TUCs/Permit, a TUC application form (Appendix 1) will be secured and completed following which a series of operational plans are required at varying levels of detail, and these are:
 - i. the TUC/Permit Area Plan covering the whole TUC/Permit area,
 - ii. the Harvesting Plan or TUC five-year operational plan covering one coupe (or group) of compartments to be logged over a period of five years,
 - iii. Compartment plans covering a single compartment (the smallest area of management) or sub-compartments.
5. In order to ensure that logging operations are properly planned and monitored, the Forestry Commission has set out the following steps:
 - i. Harvesting rights specifications prepared by the Forestry Commission in collaboration with the land owners.
 - ii. The contractor will produce a TUC Area Plan as part of the pre-operation requirements but following the initial award of the TUC.
 - iii. The successful contractor will produce a five-year harvesting plan.
 - iv. The FSD/contractor to carry out a stock survey/stand assessment of compartments to be logged in the near future.
 - v. The contractor to produce compartment plans and harvesting plan for the plantation area to be harvested.
 - vi. The FSD to prepare Completion Certificates for each compartment / sub-compartment logged.

1.2 Forest Reserve Management Plans

1. Forest Reserve Management Plans outline the goals and objectives of management and the schemes of operational prescriptions required to achieve them. Most reserves will have a number of objectives including watershed protection, carbon sequestration, Non-Timber Forest Products (NTFP) production, biodiversity protection, eco-tourism, research and timber production. The areas suitable for timber production are those areas remaining after all conservation areas have been excluded together with those areas of forest regarded as being at such a low stocking that they must be allowed ample time to recover (convalescence areas) and conversion areas.
2. The forest reserve management plan will provide details of the extent and composition of the forest resource, ownership issues and local rights, management zones (working circles) and their respective prescriptions. This Logging Manual applies only to the timber production area (working circle). Most timber production areas could also serve as NTFP production areas. Maps indicating both the extent of each management zone and the layout of the compartments are an essential component of the plan. All applicants for a TUC will be provided with the essential basic information from the management plan. Timber production areas are to be managed on a 30/40-year felling cycle - this being the time required to allow sufficient regeneration and forest recovery. Harvesting within plantation stands will be guided by a rotation and thinning regimes.

1.3 Harvesting Schedules and Thinning Regime

1.3.1 Harvesting Schedules

1. The Forest Reserve Management Plan will indicate the location and numbering of all compartments. The standard size for a single compartment (coupe) being 128 ha (1 x 0.5 miles or approximately 1600 x 800 metres); however, this is not fixed and will vary with topography and as much as possible, compartment boundaries will be linked to natural features. For each TUC area, compartments will be grouped into harvesting coupes composed of one or more compartments. Each coupe will be defined by the five (5) year period in which they may be felled.
2. A harvesting schedule for the timber production area is prepared to ensure that a sustainable harvest of timber can be continuously produced from the timber production area over the 30/40 year of the standard felling cycle. The schedule lists the compartments that can be considered for harvesting in every coupe (group) of five years, for the period of the felling cycle.
3. No logging will be permitted outside the defined harvesting period for each coupe of compartment(s). **However, compartments in the coupe immediately preceding the current coupe should be permitted for harvesting. All logging will be expected to continue progressively through each coupe, all harvestable trees being felled and extracted on a compartment-by-compartment basis.**
4. Following the completion of felling in a single compartment, that area will be closed to further logging and the contractor will be expected to move into the next compartment within the coupe. It is important to note that new compartments could only be opened after the compartment due for closure has been closed. **Returning to a closed compartment will not be allowed.** A contractor who completes logging operations prematurely within a five-year coupe area **will not be allowed** to move into the next five-year coupe until the allocated time.

1.3.2 Thinning Regime

A rotation and thinning regime will guide harvesting within plantation stands. The silvicultural prescription of a species under consideration determines the thinning regime to adopt. Other factors such as the objective of the plantation, end-use, and site index should also be considered. Table 1.1 presents a summary of activities for preparing a thinning schedule, and Tables 1.2 – 1.5, which serve as a guide, provide thinning regimes for selected plantation species.

Table 1.1: Preparation of Plantation Thinning Schedule prior to the year of harvesting

Timing (Month)	Activity/Operation	Responsibility	Remarks
1	DM should notify the FSD-ED through the RM when the coupe is due for thinning	DM	Factors to consider: Species, Planting Year, Size, Thinning Purpose, Management Decision
2	Consolidate information on coupes due for thinning and general prescriptions for thinning	RMSC/FSD HQ/ICT	Uploaded onto a national database
3	Approval of Thinning Schedule for assessment of coupes	ED-FSD	An allocation letter issued to the successful applicant
4	100% Assessment of coupes	DM-FSD	No of stems, tree diameter, and height
5	20% Verification	RM-FSD	"
6	Quality control checks	RMSC	"
7	Issuance of entry permit after approval by CE	ED-FSD	Entry permit issued to selected applicants

*For FC-owned plantations

Table 1.2: Thinning regimes for plantation species (Teak)

Year	Operation	Approximate stocking/ha for removal	Approximate residual stocking/ha
0	Planting (3m x 3m spacing)		1,110
5	Thinning	360	750
10	Thinning	250	500
15	Thinning	150	350
20	Thinning	150	200
25	Final Harvest	200	0

Table 1.3: Thinning regimes for plantation species (Cedrela/Ofram/Emire)

Year	Operation	Approximate stocking/ha for removal	Approximate residual stocking/ha
0	Planting (3m x 3m spacing)		1,110
5	Thinning	510	600
10	Thinning	200	400
20	Thinning	200	200
30+	Thinning	200	0

Table 1.4: Thinning regimes for plantation species (Gmelina 4m x 4m)

Year	Operation	Approximate stocking/ha for removal	Approximate residual stocking/ha
0	Planting (4m x 4m spacing)		625
5	Thinning	175	450
10	Thinning	150	300
15	Thinning	100	200
20	Final harvest	200	0

Table 1.5: Thinning regimes for plantation species (Gmelina 3m x 3m)

Year	Operation	Approximate stocking/ha for removal	Approximate residual stocking/ha
0	Planting (3m x 3m spacing)		1,110
5	Thinning	510	600
10	Thinning	200	400
15	Thinning	150	250
20	Final harvest	250	0

1.4 Timber Operational Specifications

Site-specific Timber Operational Specifications (TOS) will be prepared by the district forest staff for each TUC area as necessary. These will include any environmental **restrictions** that need to be adhered to and will form an integral part of the TUC Area Plan. Table 1.6 presents the plans/agreements required for on-reserve.

Table 1.6: Plans / Agreements Required for On-Reserve

No.	Plan/Agreement	Duration	Revision Required	Responsibility	Approving Authority
1.	Forest Reserve Management Plan	Twenty Years	Every 10 years	FSD	ED
2.	TUC Area Plan ¹	Whole Contract	Every 5 Years	TUC Holder	Regional Manager
3.	Harvesting Plan	Five Years (Coupe)	Five Years	TUC Holder	Regional Manager
4.	Social Responsibility Agreements	Contract Period	As and When Necessary	Joint Activity by TUC Holder and Community	Supervised and Witnessed by District Manager and District Assembly Representative
5.	Compartment Logging Plan	Logging Period	Compartment by Compartment Basis	TUC Holder	Recommended by District Manager and Approved by Regional Manager
6.	Approved Reforestation Plan	Lease Period	As and When Necessary	Lessee	Executive Director - FSD

¹ Not all permits are required to submit a 5-Year Plan

1.5 TUC Area Plan

1. This plan provides an overview of the whole contract period in terms of the location of the timber production area, areas excluded, the harvesting schedule, and the main access roads and tracks to be used. The main features of the timber operational specifications are included and details of any post-logging activities including reforestation if this is appropriate to the area. More details are expected in terms of production and utilization for the first five years together with a more detailed map of the access tracks and camps.
2. The recommended formats for the plan together with notes on its completion are provided in Appendix 2. The main features of the plan are summarised in Table 1.7.

Table 1.7: Outline of Basic TUC Area Plan

No.	Item	Comments
1.	Harvesting Schedule – (Timber Rights Holder Comments on Harvesting Schedule)	
2.	Level and Rate of Logging, Species likely to be Harvested (Used)	
3.	Outline of Existing and Proposed Access Routes to the Area	A Map of Scale 1: 50000
4.	Estimated Resources Required for Logging and Employment Generation	Equipment, Staff Numbers and Qualifications
5.	Security Issues – Prevention and Control of Illegal Activities	Concession Guards
6.	Timber Operational Specifications -Interpretation <ul style="list-style-type: none"> • Protected Areas/Species • Fire Control Measures • Environmental and Social Safeguards • Health and Safety 	
7.	Social Responsibility Agreements (SRAs)	
8.	Post-Logging Activities - (Including Reforestation Where Appropriate)	

1.6 Five-year Timber Harvesting Plan

1. As a component of the TUC Area Plan, the Timber Rights Holder is required to prepare a TUC Harvesting Plan for each five-year coupe of the contract period. The purpose of the Plan is to enable the FC to ensure that operations in the felling coupe are well planned and meet general FC standards and the TOS of the area.

Much of the information will have been provided in the TUC Area Plan and the task should not require too much additional work. Details of the recommended format and the information expected to be provided by the contractor is detailed in Appendix 3 of this manual, the main headings that should be considered are also given in Table 1.8.

Table 1.8: Outline of a 5-Year Timber Harvesting Plan

No.	Outline
1.	Detailed Annual Harvesting Plan for Period
2.	Road and Logging Track Layout, Bridges, Log Yards.
3.	Protection of Ecologically/Culturally Sensitive Areas <ul style="list-style-type: none">▪ Protected Areas/Species▪ Fire Control Measures▪ Environmental and Social Safeguards▪ Health and Safety
4.	Post Logging Activities
5.	Social Responsibility Commitments

2. The TUC/Permit Holder is expected to study the FC standards in Section Three of this Manual and the TOS so that during the preparation of the 5-year plan, these are met.

1.7 Compartment Inspection

1. Once the sequence of harvesting proposed in the five-year Harvesting Plan is approved, compartment-level planning can begin. The first stage is the Pre-Stock Survey Compartment Inspection.
2. The TUC/Permit holder and the District Manager (DM) will visit and inspect the area to be harvested. The purpose of this visit is to confirm that the area is suitable for commercial logging and to allow both the DM and the TUC/Permit holder to become familiar with factors that will affect the planning of harvesting operations.
3. Before the inspection takes place, the DM will compile all available information and prepare a detailed 1:10,000 compartment map. The compartment map will become the basis for the Annual Logging Plan.
4. The information to be collected by the DM and TUC/Permit holder before and during the field inspection include the following:
 - a. compartment boundaries
 - b. fire history
 - c. roads, tracks, bridges, culverts
 - d. forest condition scores
 - e. protected areas
 - f. rivers, other water bodies, rocky areas
 - g. topography
 - h. stocking of economic species
 - i. forest canopy
 - j. forest understorey
 - k. access
 - l. suitable sites for log yards
 - m. evidence of mining activities
 - n. sacred sites
 - o. size, composition and distribution of timber resources
 - p. presence of farms
 - q. areas to be excluded for social or environmental reasons.

5. Once the inspection has been completed the DM shall determine whether the compartment will be suitable for logging and therefore proceed with a stock survey with the consent of the TUC/Permit Holder. [Further details of this process can be found in the Manual of Procedure, Section D - Stock Survey and Yield Allocation (MoP D)].
6. The plantation inspection report will be incorporated into the harvesting plan prepared by the logger for approval by the DM. This will be one of the requirements for the grant of Entry Permit.

1.8 Stock Survey and Yield Allocation

1. The stock survey identifies all commercial timber trees in a compartment and provides the information needed to select trees for harvesting. It will also identify areas that should be protected during harvesting because of environmental and biological concerns (e.g. Swampy, Riparian buffers, etc. refer to MOP A – Strategic Planning) and provide an opportunity to undertake detailed planning of skidding tracks and the location of log yards. In situations where the Forestry Commission is unable to undertake the survey, the survey may be undertaken by the TUC/Permit Holder or Private Stock Survey Contractor if they have been certified by the Forestry Commission. The DM shall be responsible for the check survey - in which case the contractor will be required to meet the cost incurred.
2. Using the information from the stock survey the DM calculates and selects the yield for the compartment. The yield is carefully selected to ensure that all fine-grained environmental protection standards [see part 3.0] are observed during the selection process. (In selecting the yield, consideration should be given to trees to be affected by skidding trails and log yard. Skidding trails and log yards should be selected in areas that will avoid where trees are aggregated).
3. The TUC/Permit Holder can only commence logging after a Compartment Entry Permit (CEP) has been issued by the DM following endorsement and approval of the yield. The CEP should have an expiry date. **It is a requirement that the TUC/Permit Holder removes at least 90% of trees indicated in the approved yield.** Removal of only a few species leads to a gradual reduction in the value of the forest as a consequence of an increasing proportion of less desirable species.

1.9 Harvesting Plan

1. The TUC/Permit Holder must prepare a Harvesting Plan as indicated in the Manual of Procedures, Section C - Sustainable Timber Production, On-Reserve (MOP C) (Instruction Sheet C4.3), the content of which is brief and is composed of a 1:10,000 scale map. The stock survey map (scale 1:1,250) if more than 1500 trees and (scale 1:2500) if less than 1500 trees should be combined with the harvesting plan. This is acceptable if the map offered indicates contours to allow road and track alignment.
2. The Harvesting Plan is prepared by the TUC/Permit Holder and approved by the District Manager based on the compartment layout, pre-stock survey inspection report, stock map and yield map information. The harvesting plan should be vetted and endorsed by RMSC.
3. The main components of the Harvesting Plan are given in Box 1.1, and relates to road and track layout. Box 1.2 defines the responsibilities of the TUC/Permit Holder On-reserve and Box 1.3 stipulates the responsibilities of the Forestry Commission for On-reserve timber harvesting.

4. The Compartment Harvesting Plan will be attached to the yield application submitted through the DM to the Regional Manager (RM) for approval. Guidance on the preparation of the Compartment Harvesting Plan is provided in Appendix 4.
5. In accordance with the detailed instructions provided in the Manual of Procedures for Stock Survey and Yield Regulation (MOP D), the DM is required to forward the following maps and documents to the RM:-
 - 1:1,250 scale stock map suitably colour-coded as detailed in the MoP D
 - 1:1,250 scale yield map, also colour-coded
 - stock summary in tabular form
 - yield summary in tabular form
 - compartment inspection form
 - check survey form
 - application to fell special permit species, if relevant
 - harvesting plan - as prepared by the TUC/Permit Holder and approved by the DM

**BOX 1.1 SUMMARY OF MAIN COMPONENTS OF
A HARVESTING PLAN**

**1. ROAD AND TRACK CONSTRUCTION CLEARLY DEFINED ON THE
CONTOURED MAP AT A SCALE OF 1:10,000 OR BETTER.**

2. BRIDGES AND MAIN CULVERTS

3. LOCATION OF PROPOSED LOG YARDS

**4. HIGH CONSERVATION VALUE (HCV) AREAS REQUIRING
SPECIAL PROTECTION (Eg. HILLY, SWAMPS, WATER COURSE)**

**5. CONSIDERATION SHOULD BE GIVEN TO PREVIOUS LOG TRAILS
AND LOG YARDS**

BOX 1.2 RESPONSIBILITIES OF TIMBER RIGHTS HOLDER ON-RESERVE

- 1. COMPLIANCE WITH ALL PRE-OPERATION REQUIREMENTS SPECIFIED BY THE TREC TO INCLUDE THE FORMULATION OF TUC AREA PLAN**
- 2. PREPARATION OF FIVE-YEAR HARVESTING PLAN**
- 3. UNDERTAKE COMPARTMENT INSPECTION WITH DISTRICT MANAGER**
- 4. PAY FOR STOCK SURVEY OPERATIONS**
- 5. PREPARE HARVESTING PLAN FOR APPROVAL BY DM**
- 6. COMPLETION OF LOG INFORMATION FORMS**
- 7. RENEW PROPERTY MARK AS REQUIRED**
- 8. ASSIST IN THE PROTECTION OF THE TUC/PERMIT AREA**
- 9. PAYMENT OF TIMBER RIGHTS FEE, STUMPAGE, GROUND RENT AND SRA**

**BOX 1.3 RESPONSIBILITIES
OF THE FORESTRY COMMISSION
FOR ON-RESERVE TIMBER HARVESTING**

- 1. PREPARATION OF MANAGEMENT PLANS FOR EACH FOREST RESERVE**
- 2. IDENTIFICATION OF TUC/PERMIT AREA AND ESTABLISHMENT OF CLEAR BOUNDARIES**
- 3. DELINEATION OF COMPARTMENTS AND PREPARATION OF HARVESTING SCHEDULE**
- 4. PREPARATION OF TIMBER OPERATION SPECIFICATIONS FOLLOWING CONSULTATIVE PROCESS**
- 5. AWARD OF CONTRACT AND ENDORSEMENT OF TUC/PERMIT AREA PLAN AND HARVEST PLANS**
- 6. PRE-STOCK SURVEY INSPECTION**
- 7. STOCK SURVEY AND YIELD REGULATION**
- 8. APPROVAL OF HARVESTING PLANS**
- 9. DATA CAPTURE FOR CHAIN OF CUSTODY**
- 10. OVERALL SUPERVISION AND MONITORING**
- 11. COLLECTION OF REVENUE AND DISBURSEMENT OF ROYALTIES**

SECTION TWO - PLANNING FOR TIMBER HARVESTING OUTSIDE FOREST RESERVES

2.0 Introduction

1. The 2012 Forest and Wildlife Policy (FWP) and legislative framework recognises that logging outside the forest reserves takes place predominantly on farmlands. Planning for timber harvesting outside the forest reserve therefore requires that, farmers and landowners play a critical role in the planning of logging operations on their lands.
2. This section describes a code of practice for the planning of timber harvesting outside forest reserves to ensure that operations are carried out in a socially responsible and environmentally sound manner.
3. Timber trees in off-reserve areas are scattered over a wide area, unlike on-reserve areas, so acquiring TUCs in off-reserve areas is no longer attractive. In view of this, the right to harvest natural forest timber in off-reserve is mostly regulated by Permits (e.g. Salvage Permits, Timber Utilization Permits).
4. Off-reserve plantation timber is mainly sourced from private small-holder and small-scale commercial timber plantations. However, there are few private medium and large-scale commercial plantations. Currently, the main plantation species include *Tectona grandis* (Teak), *Cedrela odorata* (Cedrela), *Gmelina aborea* (Gmelina), *Eucalyptus spp.*, and *Terminalia superba* (Ofram).
5. The FC provides extension services and registers off-reserve trees.

2.1 Identification of Areas for Timber Harvesting Outside Forest Reserves (OFR)

1. The steps leading to the granting of a Permit are;
 - Identification of potential trees to be felled within the OFR areas by the interested party.
 - The DM will conduct a pre-felling inspection and submit a pre-felling inspection report as captured in Form CO2 and CO3 through the RM for verification and recommendation to the Executive Director (ED) of the Forest Services Division.
 - The report which includes farmer(s) and stool land owner consent letters is forwarded to the Minister of Lands and Natural Resources for the grant of felling rights based on the recommendation of the Chief Executive of the Forestry Commission.
 - For salvage permits, approval is granted by the Chief Executive of the Forestry Commission
 - The permit holder will register or renew a Property Mark. Box 2.1 and 2.2 highlights the responsibilities of Timber Rights Holder and the Forestry Commission respectively.
 - In the case of private plantation off-reserve, trees are felled, hauled to a log yard for inspection and measured by FSD. Approval for issuance of Plantation Log Measurement Conveyance Certificate (PLMCC) is granted by Regional Manager.
2. For the Timber Utilisation Permit (TUP), the process for identification and granting of trees to applicants within a particular forest area is simplified since such permits are for developmental projects within the community.

**BOX 2.1 RESPONSIBILITIES OF
THE TIMBER RIGHTS HOLDER OFF-RESERVE**

- 1. SECURE LETTERS OF CONSENT FROM FARMERS AND OR LANDOWNERS**
- 2. INITIAL MARKING OF TREES WITH NUMBERS**
- 3. FULFILMENT OF SRA WITH LOCAL COMMUNITIES**
- 4. PAYMENT OF STUMPAGE AND GROUND RENT.**
- 5. REGISTRATION AND RENEWAL OF PROPERTY MARK AT SIX MONTHLY INTERVALS.**
- 6. PAYMENT OF COMPENSATION FOR CROP DAMAGE**
- 7. PAYMENT OF TIMBER TENDING BENEFITS**

**BOX 2.2 RESPONSIBILITIES OF THE
FORESTRY COMMISSION OFF-RESERVE**

- 1. DELINEATION OF THE PERMIT AREA**
- 2. DEVELOPMENT OF TIMBER OPERATIONAL SPECIFICATIONS WITH ALL INVOLVED PARTIES**
- 3. GRANTING OF TIMBER FELLING RIGHTS**
- 4. PRE-FELLING INSPECTION AND YIELD APPROVAL**
- 5. DATA CAPTURE FOR CHAIN OF CUSTODY**
- 6. COLLECTION OF REVENUE AND DISBURSEMENT OF ROYALTIES**
- 7. ENSURE PAYMENT BY TIMBER RIGHTS HOLDER**
- 8. MONITORING AND SUPERVISION.**

SECTION THREE - TIMBER HARVESTING STANDARDS AND SPECIFICATIONS

3.0 Introduction

1. This section of the Manual prescribes the standards that the FC requires all contractors to adhere to when planning and carrying out harvesting operations to ensure Reduced Impact Logging (RIL). Periodic audits of timber harvesting operations will be carried out by the FC to ensure strict compliance with these standards. The standards form part of the Terms and Conditions of the TUC.
2. Standards fall into four categories, as follows:
 - Logging practice standards/specifications;
 - Environmental standards;
 - Sociocultural requirements; and
 - Health and safety standards.

3.1 Logging Practice Standards / Specifications

This section sets standards for logging in on and off reserve for both natural forest and plantation forest.

Roads

1. Where the logging plan requires the construction or rehabilitation of public roads the specifications will first be agreed with the Ministry of Roads and Highways and the specification and agreement appended to the plan.
2. Before construction, all roads must be surveyed following the logging plan. It is the responsibility of the TUC holder to ensure that the construction team adheres to the agreed alignment and avoids streams as much as possible.
3. Roads shall be designed in such a way that there is minimum disturbance to the forest and farms. Where areas are being re-logged, there should be an attempt to use the old road system as much as possible. Table 3.1 presents the roading specifications.

Table 3.1: Roading specifications

Description	Unit	Main	Feeder	Spur
Cleared width	m	12	10	-
Carriage width	m	6	4.5	3.5
Min. surface depth	cm	10	10	as required
Max. gradient	%	10	12	14
Max. adverse gradient	%	6	8	8
Min. distance from small streams	m	30	30	30
Min. distance form rivers	m	60	60	60
Mini intervals for drains				
(road gradient 20%)		50	50	50
(road gradient 10% or less)		100	100	100

4. All forest roads shall be compacted to prolong road life. **Road construction may not be carried out during the wet season.** Marshy areas are to be filled with gravel, compacted, and if essential, decked with scantlings from species mentioned in point 9 below.

5. All water courses, culverts and drains must be cleared. Figure 3.1 shows the clearing of water courses during harvesting and Figure 3.2 shows the importance of adequate road drainage.

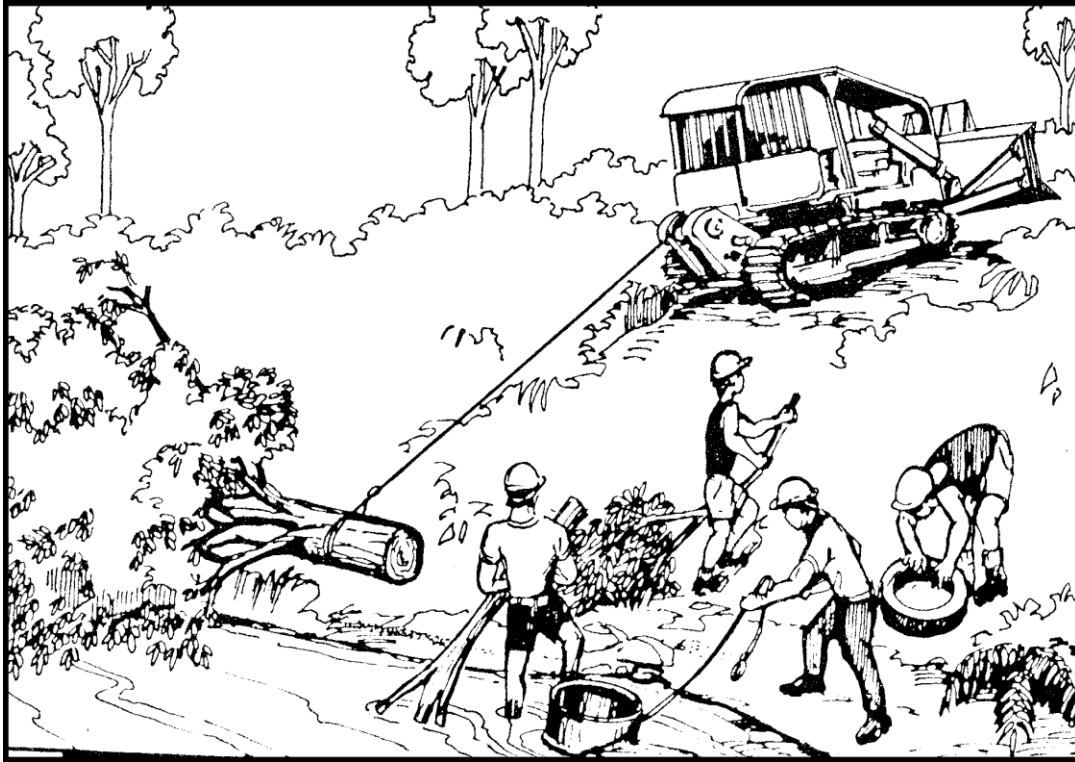


Figure 3.1: Water ways been cleared after harvesting

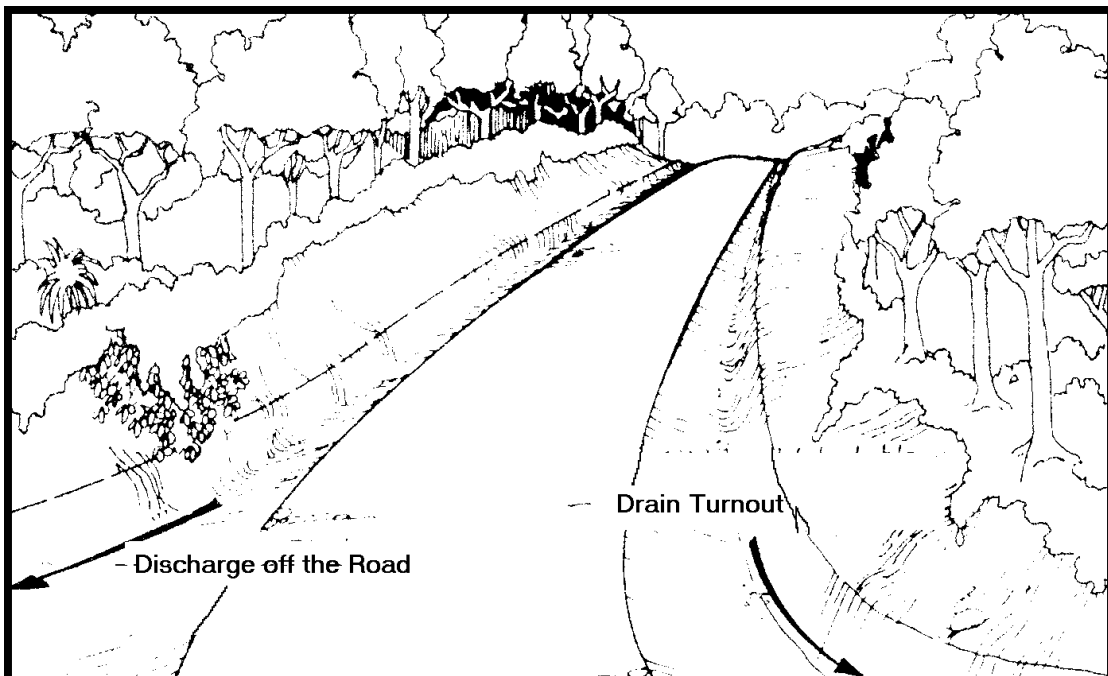


Figure 3.2: Road drainage

6. To prevent excessive soil disturbance, any tree with a diameter above 15 centimetres that is located within the road alignment, must be felled into the road corridor with a chainsaw (not pushed by a bulldozer) prior to road construction. Where these are

commercial species with a diameter above the minimum felling limit, they will be deducted from the yield and stumpage will be charged.

7. The Timber Rights Holder is responsible for constructing and maintaining all roads in accordance with the specifications described until the compartment is closed. Non-adherence will lead to suspension of harvesting activities until such a time that corrective measures have been carried out.

Bridges

8. Bridges shall be constructed perpendicularly to courses of streams and rivers. Logs, piles, beams, deck runners, etc are recommended for the construction of bridges over streams and rivers. Any tree or branch that falls into a watercourse shall be removed immediately.
9. Suitable hardwood species are recommended for bridge construction. Examples are;

Azelia africana (Papao),
Nesogordonia papaverifera (Danta)
Cylicodiscus gabonensis (Denya),
Erythrophloem species (Potrodom),
Mammea africana (Bompagya),
Nauclea diderrichii (Kusia),
Piptadinastrum africanum (Dahoma),
Strombosia glaucescens (Afena),
Cynometra ananta (Ananta),
Tectona grandis (Teak)

Felling

10. Prior to felling, escape routes around the tree must be identified and cleared. Tree to be felled should be directed towards skid tracks or canopy openings so that they cause minimum damage to surrounding trees. Trees should be felled in a manner that will cause minimal disturbance to the surrounding forest during log extraction. This is to assist efficient skidding by laying the crown or the butt towards the skid tracks.
11. To avoid human accidents, any tree hanging and or leaning on other trees after felling must be brought to the ground before operations continue.
12. Felling of trees shall be carried out only by workers competent in the use of chainsaws and all chainsaws used should be registered following regulations 67 and 68 of L.I 2254.
13. Trees are to be felled as close to ground level as possible and must be felled using a scarf and back cut so that the direction of felling is controlled. Where buttressing or fluting does not occur, and the tree is sound at the butt, stump height should not be greater than 50 cm.
14. Trees with stilt roots, buttresses and flutes should be felled not more than 20 cm above the point of convergence.

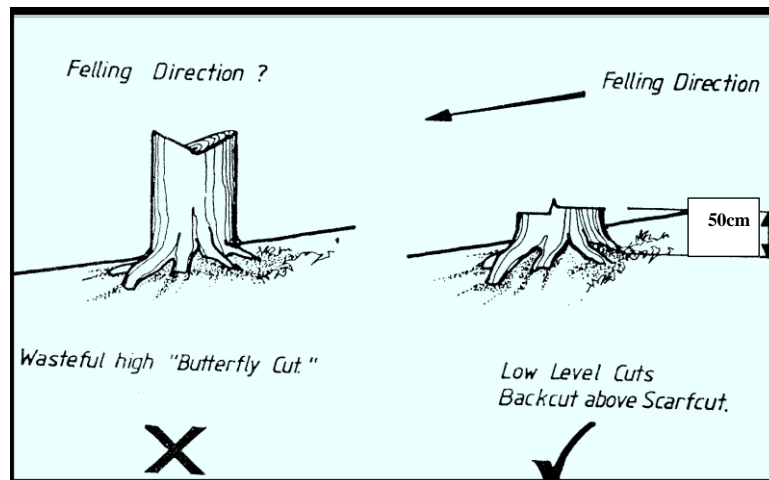


Figure 3.3: Bad and Good Felling Practices

15. For various plantation species, maximum stump heights are as indicated in the table below;

Species	Maximum stump height (cm)
<i>Tectona grandis</i> (Teak), <i>Eucalyptus grandis</i> (Eucalyptus)	20
<i>Cedrela odorata</i> (Cedrela)	30
<i>Gmelina aborea</i> (Gmelina)	30
Indigenous	50
<ul style="list-style-type: none"> • <i>Terminalia ivorensis</i> (Emire) • <i>Terminalia superba</i> (Ofram) • <i>Ceiba pentandra</i> (Ceiba) • <i>Khaya ivorensis</i> (mahogany), etc 	

16. Trees must not be felled:
- within riparian buffers (refer to section 3.2)
 - on slopes with a gradient of more than 30%
 - on slopes with a gradient from 20% to 30% without approval by the DM
 - at any other ecologically sensitive areas
17. All timber trees felled within the approved yield will attract stumpage fees including trees felled during road construction.
- However, where defects occur, it will be assessed and depending on its degree, the affected volume may be estimated and deducted from the total tree volume for calculation of stumpage.
18. Disposal of abandoned logs and offcuts should be done by Regulation 30 of L.I 2254.

Tree, Log, and Stump Markings and Measurements

19. After felling, the tree must be converted to logs as efficiently as possible and both the log and the stump must be marked by the specifications given in Box 3.1 and Appendix 6.
20. Logs are to be marked before they are extracted. All logs must be marked clearly on both ends with white waterproof paint. Letters and numbers must be at least 6 centimetres high and 1½ centimetres wide.

21. The tree stump is to be marked prior to the extraction of logs.
22. In forest plantations, tree stumps should be marked with the compartment number and contractor numbers which should be numbered serially.
23. In the case of natural forest harvesting, logs must have the following marks with indelible ink as shown in Box 3.1. The steps involved in the measurement of felled tree/logs, in natural forest and plantation forest, is shown in Box 3.2 and 3.3. respectively.

BOX 3.1 MARKING AND NUMBERING OF FELLED TREES AND LOGS

The following are the details to be marked on the tree or log;

- the species code (appendix 6a);
- the locality mark (appendix 6b);
- the TUC/Permit Holders' tree number which should be sequential within the Compartment (on reserve) and off-reserve TUC/permit areas beginning with 1.
- the log number which is the number of the log cut from the tree; log number 1 is the butt log;
- The TUC/Permit Holders' Property Mark.

Logs from within forest reserves must also be marked with:

- the reserve code (appendix 6c);
- compartment number;
- stock number

Logs from off-reserve areas must also be marked with:

- the code "OFR";
- pre-felling stock number

BOX 3.2 FIELD MEASUREMENT OF TREES IN NATURAL FOREST

A - Trees with moderate, little or without buttress

1. Measure the two diameters (Db_1 and Db_2) over-bark at the butt end perpendicular to each other using a linear tape.
2. Measure the entire utilizable bole length i.e from the point where the tree was cut to the point where the tree crown forms using a linear tape.
3. Measure the two diameters (Dt_1 and Dt_2) over-bark at the top/taper end perpendicular to each other using a linear tape.

B - Trees with large buttress

1. Measure the two diameters (Db_1 and Db_2) over-bark at the butt end perpendicular to each other at a point 30 cm beyond the point of convergence of the buttress using a linear tape.
2. Measure the entire utilizable bole length i.e from the point where the tree was cut to the point where the tree crown forms using a linear tape. Take note that where the first branch comes off the main trunk is not where the tree crown forms.
3. Measure the two diameters (Dt_1 and Dt_2) over-bark at the top/taper end perpendicular to each other using a linear tape.

C - Trees with large buttresses and long poles

1. Diameters (Db and Dt) and length are measured following the steps in trees with large buttress.
2. A third diameter (Dm) is taken at another point around the mid-point so that the tree/bole will be able to be sectioned into two (2) logs. The tree bole and this point of measurement

Refer to Forestry Commission (2011), Tree Bole / Log Volume Tables Measurement Procedure

D - Computation of tree bole/log volume

The volume is computed in cubic metres using either the ready reckoner or Smalian's Formula after obtaining the measurements for butt end diameter (Db), top/taper end diameter (Dt) and the length (L). Refer to the Fifth Schedule of the L.I 2254

BOX 3.3 FIELD MEASUREMENT IN PLANTATION FOREST

A - Logs measurement procedures

1. Measure the midpoint diameters (Dm) over-bark of the log using diameter tape
2. Measure the entire utilizable log length with tape measure (i.e from the point where the tree was cut to the point where top/tapering diameter is 10 cm and above using linear tape).

B - Computation of log volume

The volume is computed in cubic metres using either the ready Reckoner or Huber's Formula after obtaining the measurements for midpoint diameter (Dm).

$$V = \frac{\pi \times d^2 \times L}{40\,000}$$

where V = volume in cubic metres

L = length in metres

d = mid diameter in centimetres

π = 3.1415927

Skidding

24. Major skid tracks should be routed along the contours / ridges and marked out prior to operations. As much as possible, old / existing skidding trails should be used in order to cause minimal damage to the residual stand. The skid track must not cross water courses. During skidding, damage to residual trees along the trail should be minimized. Minimal skidding distance to the nearest log yard within the compartment should be targeted.

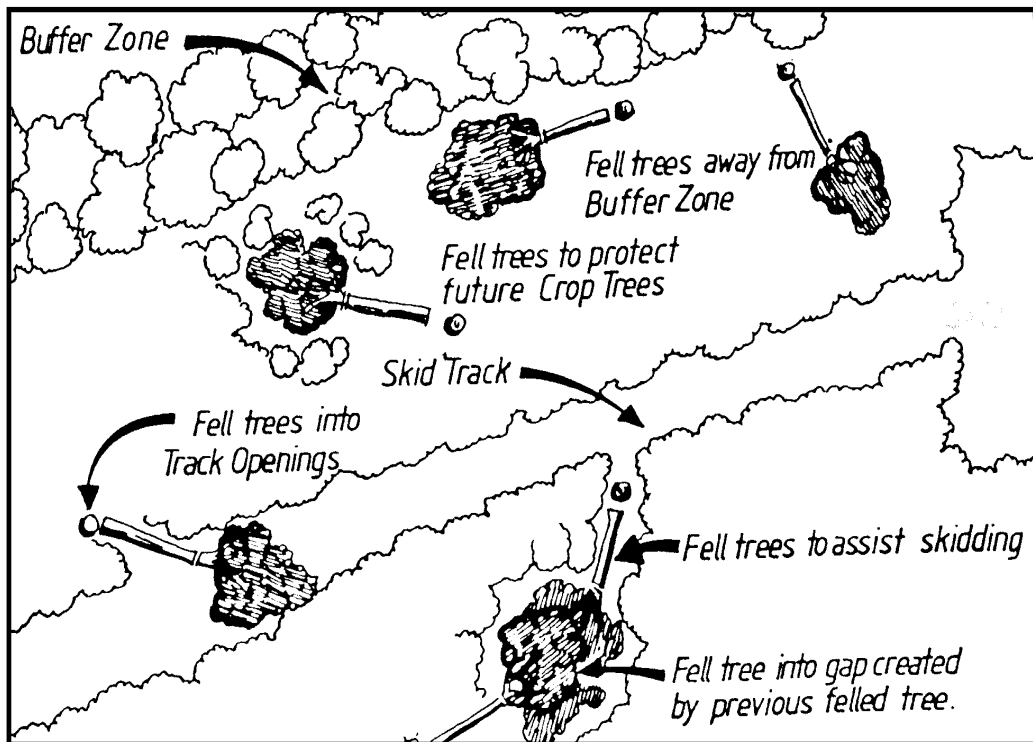


Figure 3.4: Directional Felling

25. To facilitate directional felling, a winch may be used during the breaking out or felling of trees on slopes with a gradient of more than 20 percent to minimize disturbance to the surrounding forest or farms. The log must be raised at the front end to minimize soil disturbance. Damage to standing trees and farm crops must be kept to a minimum. Operations must be halted during wet weather if poor ground traction causes excessive soil disturbance.
26. Logs must be skidded from the felling site to the log yard as soon as practicable after measurement.
27. If, in the opinion of the District Manager, skidding operations are causing excessive environmental damage or are being carried out without adequate safety precautions, the DM may suspend operations until adequate corrective measures have been undertaken or may require that operations in the area are halted.

Log yards

28. Log yards are cleared areas, where logs are temporarily deposited after skidding from the felling site. They must be constructed in open areas away from streams as specified in the Logging Plan. They normally should be at least 40m from the edge of riparian buffers.
29. Log yards must be kept as small as practicable and should not be more than one-quarter of a hectare in area. There should not be more than four (4) log yards constructed per standard compartment (128 hectares).
30. Contractors will be required to ensure that all log yards are provided with drainage structures that prevent runoff onto roads or streams. They should be scarified before use and the topsoil kept aside. After logging operations have been completed, the timber contractors will be required to deep rip the old log yards, replace the topsoil to plant desirable indigenous timber trees, and to ensure that drainage structures are maintained.
31. If, in the opinion of the District Manager, log yards have not been correctly constructed or maintained, he may suspend operations until he is satisfied that adequate corrective measures have been taken.
32. In plantation harvesting, the size of a yard will depend on the scale of operations and it should not exceed (0.15ha). For every 100 ha, the cumulative area for log yards should not exceed 0.5ha.
33. Plantation forest should have a log yard as shown in the table below;

Area (ha)	Number of log yard
Less than 10 ha	1
11 to 32 ha	2
32 to 64 ha	3
65 to 100 ha	4
Above 100 ha	5

Monitoring of Logging Operations

34. The District Manager is responsible for ensuring that all logging operations are monitored regularly. During monitoring, the DM or his representative will check compliance with the logging plan and this manual.
35. In particular, the DM will check roads, bridges, culverts and log yards construction and maintenance; the standard of felling and skidding operations; compliance with requirements for log and stump markings; and damage to the residual stand.
36. If for any reason, the DM is not satisfied with the standard of operations, he/she may take action as he/she considers necessary including suspension of operations and the imposition of penalties. If such action is taken, the reasons must be communicated in writing to the TUC/Permit Holder and copied to the Executive Director (ED) of the Forest Services Division.

37. During operations on-reserve, the TUC/Permit Holder will need to work consistently through the selected compartment to remove all approved trees within a maximum period of three years (refer to MOP D). No re-entry will be allowed after the compartment has been closed from logging activities except under exceptional circumstances.
38. A detailed inspection will be undertaken prior to the closure of the compartment by the DM and a checklist completed (Box 3.4) that standards have been maintained at an acceptable level. If these have been fully met, a Compartment Closure Certificate which is part of the logging control forms (Appendix 5) will be issued. Refer to Section 6.13 of MOP D for all rules and regulations governing compartment closure.
39. The maximum number of compartments to be opened at a time for harvesting for large, medium, and small-scale TUC Holders within a forest reserve shall be 5, 3, and 2 compartments in that order.

BOX 3.4 CHECKS REQUIRED FOR ISSUE OF COMPARTMENT CLOSURE CERTIFICATE

- 1. All streams and water courses clear of debris.**
- 2. All access and skidding tracks follow the agreed alignment and adequate drainage provided.**
- 3. Log yards have been ripped to break up compacted soil.**
- 4. Spread back the topsoil over the log yards.**
- 5. The DM must ensure that the log yards are planted with indigenous timber trees.**
- 6. At least 90% of trees in the approved yield have been extracted and all fees including stumpage and compensation paid.**
- 7. All waste removed from the site.**
- 8. The conditions of the Timber Operation Specifications have been met - including all aspects of the Social Responsibility Agreement.**

40. Note that district assembly members, traditional authorities, unit committee members and farmers may also inspect logging operations in off-reserve areas. If they consider the standard of these operations to be unsatisfactory, they may report this to the District Manager who will verify this by carrying out his own inspection.
41. For off-reserve logging, the DM must similarly be satisfied that all the requirements of the Logging Manual and the Permit area have been met and that all compensation for damage to crops and farms has been paid.

Supervision

42. A Logging Supervisor must be present at all times when operations under the Logging Plan are being carried out. The Logging Supervisor is responsible for ensuring that all

operations are carried out in accordance with the provisions of the Logging Manual and the Timber Utilisation Contract, in particular, that, damage to the environment is minimized and operations are carried out safely. The Logging Supervisor must also be familiar with the principles of first aid.

43. The Logging Supervisor is responsible for ensuring that all logs and stumps are marked as stipulated above (Box 3.1), and that a record is kept of all trees felled against those on the felling permit. This record must be available at all times for inspection by the District Manager.

3.2 Environmental Standards

This refers mostly to the fine-grained protection measures which are detailed in the MoP D - Stock Survey and Yield Allocation.

Protected Areas

1. No logging operation, including felling, skidding, road and log yard construction is permitted in Protected Areas within Forest Reserves. Such areas include sacred groves, fauna protection areas, hill sanctuaries, provenance protection areas, convalescence areas, Globally Significant Biodiversity Areas (GSBAs), High Conservation Value Areas (HCVAs), riparian buffers and swamp sanctuary.
2. The DM shall take all reasonable measures including the destruction of the timber so produced to ensure that the perpetrators will not benefit from the illegal operations based on the following;
 - This is intended to discourage deliberate wanton destruction of protected areas, and disincentivize to future illegal timber operations.
 - To prevent opening up (skidding trails, log dumps, roads etc) of the area through timber extraction process which will facilitate future illegal logging and other forest infractions in the area leading to loss of biodiversity and forest fragmentation.
3. Any staff of the Forestry Commission whose action or inaction violates or infringes on any of the provisions of this logging manual commits an intolerable offence.
4. Protected Areas within Production Compartments must be clearly marked on the TUC Operational Plan, the Annual Logging and the Compartment Logging Plans at the appropriate scales. The logger is directly responsible for ensuring that all designated protected areas that fall within or adjacent to the Contract Area are respected.

Protected Species

5. Any tree species classified as Black Star cannot be felled under any circumstances. Any tree ($\geq 50\text{cm}$ dbh) classified as a restricted Species cannot be felled, unless this is specifically authorised by the Minister or designated representative for the purpose of road or log yard construction.
6. Black Star and restricted species are listed in Appendix 6 which may be amended from time to time by the Forestry Commission.

Riparian Buffer Zone

7. Siltation of watercourses is a major cause of water pollution and environmental degradation. No logging operation will be permitted within a buffer strip, 30 metres

either side of any stream or 60 metres either side of a river. No tree felling into the buffer strip will be permitted. Any tree or debris that falls within the watercourse must be removed.

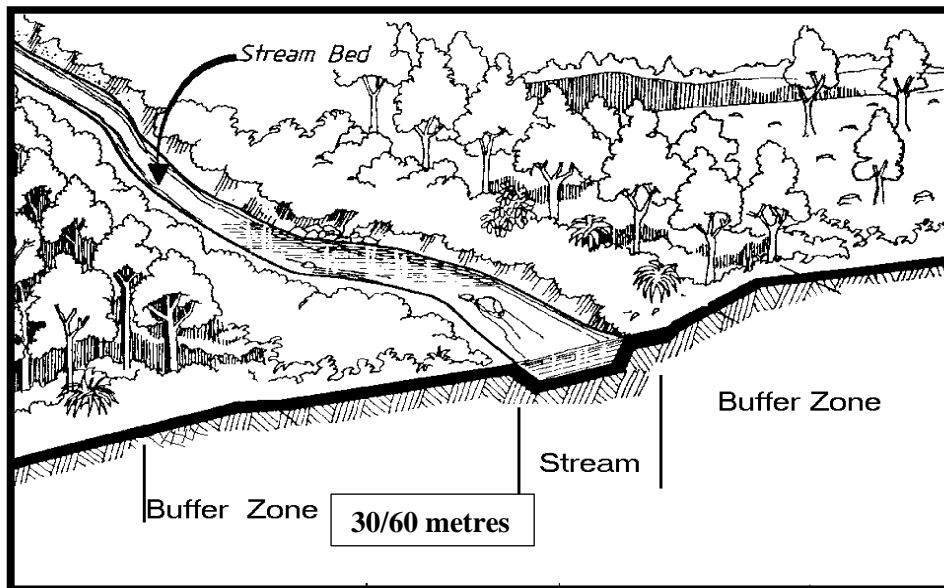


Figure 3.5: Riverine Buffer Zones (Vegetated area near a river or a stream)

Wildfire Management

8. During high-fire risk periods, the use of naked fire should be restricted to only the log yards. Any fire for cooking or other purpose (eg. smoking) must be at least 10 metres away from any inflammable material and must not be left unattended.
9. The logger or operator must ensure that all vehicles are equipped with fire extinguishers and that members of the logging team are equipped with fire swatters or beaters.
10. In the event of a fire incident, the District Manager may require the logger or operator to assist with fire-fighting, by providing manpower, equipment, vehicles, or earth-moving machinery. The logger or operator is not entitled to compensation or payment for such assistance.
11. The District Manager may prohibit the use of fire, when he determines that, the risk is high. In such a situation, there shall be no lighting of fires by the logger or operator for any purpose.

3.3 Social Responsibility Agreement

1. Regulation 26 (1) of L.I 2254 provides to the effect that 'a holder of timber right shall negotiate a social responsibility agreement with communities in and around the contract area at the value of five percent (5%) of the stumpage fee.
2. Regulation 26 (2) also states that the social responsibility agreement shall take into account the terms in the Social Responsibility Agreement Guidelines and Code of Conduct.
3. The Forestry Commission requires the logger to respect the rights of the forest fringe communities. A Social Responsibility Agreement (SRA) is required before a Timber Utilization Contract (TUC) is awarded.

4. The primary purpose of the SRA is to ensure that the TUC is executed in a manner in which the interests of the local communities are fully taken into account along with the wider national requirements relating to socio-cultural values, watershed, environment and bio-diversity protection.
5. The secondary purpose is to ensure the logger can operate without obstruction as long as the terms of the agreement are kept.
6. The SRA is entered into by the logger and the Forest Fringe Communities and it forms an integral part of the TUC and the terms and conditions become binding on both parties.
1. Social Responsibility comprises two main elements:
 - a) Code of Conduct: the logger is required to ensure that all TUC operations are conducted according to an agreed Code of Conduct. The Code of Conduct ensures that the various rights of the forest fringe communities and the rights of the logger are respected.
 - b) Social Obligations: the logger is required to meet certain agreed Social Obligations to the Forest Fringe communities.
2. The Forest Fringe Communities (FFC) will agree to respect the right of the logger to be able to operate in the TUC area without obstruction or hindrance so long as the terms of the SRA are being complied with.
3. The process for developing an SRA is initiated by the Forestry Commission during the identification of the TUC contract area. The DM will consult with forest fringe communities to ensure that, areas which the community wishes to exclude from logging are identified and respected. The DM will request the communities to specify reasonable social terms for the Timber Operational Specifications (TOS).
4. Once the TUC has been advertised, applicants may want to approach the communities to ensure that they understand all aspects of the TOS. Following the selection of the successful logger, the stool representative of the forest fringe communities and the applicant will be party to the agreement. However, all the Odikros/chief's representatives of the communities should have been consulted by the TUC holder or the stool chief in this negotiation process and they are to be witnesses to the agreement.
5. The DM shall not be a party to the Agreement, but will however facilitate the negotiation process. The SRA will become a public document once the TUC has been awarded to the successful applicant.
6. The communities concerned will monitor the operations of the logger and report any problems to the DM for investigation and further action if warranted. The sanctions for failure to comply with the terms of the SRA will be specified in the TUC. In instances where the logger fails to comply, the DM may decide to suspend their operations; the TUC may be terminated by the Minister upon recommendation by the Forestry Commission. Likewise, the logger may report the Forest Fringe communities to the DM if they are obstructing timber operations even though all elements of the SRA are being complied with.

Code of Conduct

The Code of Conduct recognises that, the following rights of the forest fringe communities be respected during TUC/Permit operations:

- respect for cultural norms such as taboo days
 - respect for right of access to forest products for domestic use
 - respect right to consultation concerning location of logging roads, etc
 - respect need to make all payments in a timely manner
 - respect for local infrastructure
1. The Code of Conduct for forest reserve TUC areas will specify how the two parties have agreed to ensure these rights are respected.
 2. The Code of Conduct will be agreed for each off-reserve TUC/Permit area in accordance with the TOS of the TUC/Permit area. In drawing up the Code of Conduct for off-reserve TUC/Permit areas, it must be recognised that the primary land use in these areas is farming. The Code of Conduct recognises that the rights of the farmers and community members are to be respected during TUC/Permit operations.
 3. These rights include respect for the following:
 - farming activities (for off-reserve areas)
 - socio-cultural norms
 - communal rights to non-timber forest products
 - right to consultation during planning of operations
 - local infrastructure
 - need to make all payments in a timely manner
 - right of farmers to receive payment for timber tree nurtured (for off-reserve areas)
 - adequate crop protection and payment of appropriate compensation for crop damage (for off reserve areas)

Social Obligations

1. The Social Obligations for each TUC/Permit area will be agreed based on the Timber Operational Specifications for that area. The Social Obligations are direct support to the community in terms of material and cash for well-defined development projects, paid in a transparent manner.
2. The TOS is prepared and submitted by the logger to the DM for approval. The Social Obligations will be negotiated based on the TOS but they may comprise the following:
 - The logger to provide a certain amount of support to local infrastructural development for example a contribution to the building of a new community structure such as a school at the value of 5% of the stumpage fee.
 - The logger to provide a certain amount of off-cuts/lumber/logs for community use.
 - The logger to agree to provide a certain amount of local employment.
3. The Social Obligations are to the forest fringe communities and not to the office of the stool chiefs.

SECTION FOUR - MONITORING OF TIMBER HARVESTING OPERATIONS

4.0 Introduction

1. The Forestry Commission is required to undertake regular monitoring of timber harvesting operations both on and off-reserve areas. Monitoring will also include the likely socio-economic and environmental effects on the fringe communities. A more detailed biannual audit is required for property mark renewal and/or extension of permit. An inspection is required immediately after the completion of logging in any compartment/series/plantation coupe as a pre-requisite for the issuance of Closure Certificate.

4.1 On and Off- Reserve

1. In on-reserve areas, the District Manager is expected to monitor timber harvesting operations to ensure that, operations conform to the set standards. The DM is responsible for maintaining accurate records of all timber extracted which should be documented in the compartment register. The DM should ensure that loggers do not re-enter closed compartments for harvesting until the next harvesting cycle. The Director of RMSC should ensure strict compliance with the harvesting schedule and not endorse re-entry into closed compartments prior to the next harvesting cycle.
2. In off-reserve areas, the quality of logging and in particular the level of damage to crops/property will be regularly monitored. The DM will ensure that prompt and adequate payment of compensation are paid to farmers whose crop/property are adversely impacted by logging and harvesting operations. An inspection should be carried out at the end of each year or permit period to ensure that the annual plan has been adhered to and whether the logger can be allowed to move into the area defined for the following year.

4.2 Logging Infractions and Penalties

1. If it is determined that, harvesting operations are not being carried out in accordance with the provisions of this Manual, the DM may require that the operations of the company be suspended and appropriate corrective measures taken. The operations will remain suspended until such a time that the DM is satisfied that the corrective measures have been effected, adequate precautions taken and/or appropriate penalties paid.
2. If, in the opinion of the District Manager there has been excessive damage to the forest stand as a result of operations not being carried out in accordance with the provisions of this Manual, the timber rights holder shall be surcharged for the damage caused in accordance with the following provisions:
 - In the case of environmental damage, there will be a valuation to determine the degree and extent of damage, and based on the valuation outcome, penalties will be surcharged.
 - in the case of each tree that has been felled but that was not part of the approved yield, a penalty of ten times the market value shall be surcharged;
 - in the case of species that require special permit as specified in Appendix 6, a penalty of ten times the market value shall be surcharged;

- in the case of high stumps being left during felling, log splits or other wastage caused by poor felling practice, a penalty of two times the current stumpage for that species.

If the affected company disputes the decision of the DM, he may petition the Regional Manager for redress. However, in case a resolution is not reached the matter may be referred to RMSC.

3. If, in the opinion of the District Manager there has been damage to crops as a result of operations not being carried out in accordance with the provisions of the Logging Manual, and compensation has not been paid by the Contractor or the holder of the felling permit; then the DM may suspend operations until he/she is satisfied that such compensation has been paid.

GLOSSARY

TERMINOLOGY	INTERPRETATION
Buffer Zone	It refers to the existence of physical areas that separate either two ecological systems or an ecological system from other land uses or that border a water body.
Chain of Custody	Chain of Custody is a system that enables the seller of the timber or timber products to provide evidence to the buyer of the goods about the status of the material being sold. This may for example be evidence that the material being sold is from legal sources or certified sources.
Compartment	It forms the basic planning unit on-reserve and has a standard dimension of 1,600 m x 800 m approx. (equivalent to 128 ha)
Forest	In Ghana, a forest is any piece of land with a minimum area of 1 hectare, with a minimum canopy cover of 15% and with trees that have the potential to reach or have reached a minimum height of 5 metres at maturity in situ.
Forest Fringe Communities	Eligible communities to benefit from Social Responsibility Agreement (SRA) within five kilometres (5km) around a forest reserve or within the timber operational area in off-reserve areas.
Forest Plantations	Forests established by deliberate seeding or planting, that possess features of uniformity, shape, and often the intensity of management. Usually, they are established on degraded lands with the same species and have the same age and regular spacing.
Forest Reserve	"Forest Reserve" means a Forest Reserve constituted under section 17 of the Forests Ordinance (Cap. 157).
Forestry	Forestry is the science and craft of creating, managing, planting, using, conserving, and repairing forests and woodlands for associated resources for human and environmental benefits.
Ground Rent	It refers to the fee levied or paid per hectare per annum to the owner or landlord for the exercise of timber rights on his piece of land as specified in the contract
Harvesting	It is the felling, cutting, converting, collecting or otherwise disposing of timber from land or a water body.
Harvesting Schedule	It sets the order in which compartments should be logged on the basis of their suitability or readiness for logging.
Hauling Roads	These are roads with very narrow clearing widths and minimal formation in a forest and are used for movement of logs amongst others.
Logging	It is the process of harvesting trees, sawing them into appropriate lengths (bucking), and transporting them (skidding) to a sawmill.
Natural Forest	A forest composed of indigenous trees not established by planting or/and seeding in the process of afforestation or reforestation.
Off-Reserve	These are areas outside the gazette forest reserve. This encompasses naturally regenerated trees-on-farms and agricultural fallow lands and patches of natural forest stands.
Property Mark	It is a mark placed on trees or timber to denote that after the purchase money due has been paid the registered holder of the property mark has or will have a right in the trees or timber.

TERMINOLOGY	INTERPRETATION
Reforestation	Re-establishment of forest through planting and/or deliberate seeding on degraded land previously classified as forest.
Social Responsibility Agreement (SRA)	It is an agreement between the timber rights/permit holder and the landowning communities (inhabitants within a 5 km radius of the contract area) which spells out the social obligation to a value of 5% of the stumpage value of timber harvested and the code of conduct
Stock Survey	A stock survey involves the enumeration of all economic tree species from 50 cm dbh and above (except Afena which is ≥ 30 cm dbh) and gathering information on environmentally sensitive areas (eg. Slopes $>30\%$, marshy areas, water bodies, etc). It provides quantitative information upon which a final decision on whether or not to harvest is made.
Stumpage	It represents royalties that provide a basic return to the landowner and contribute to the cost of forest management and timber regulation.
Timber	It includes trees when they have fallen or have been felled, and the wood, whether it has been cut up or fashioned or hollowed out for a purpose or not.
Timber Production Area	Healthy productive forest with mean basal area $\geq 15\text{m}^2 / \text{ha}$. Timber production areas within the High Forest are managed per the regulations relating to the timber utilization contracts.
Timber Rights Fee	It is a one-off payment made by a Timber Rights Holder based on the tree stocking of the contract area.
Timber Rights Holder (TRH)	A company that holds a timber right in the form of a large, medium or small-scale timber utilization contract or other source of timber.
Timber Utilization Contract	It is a written contract signed by the Minister and ratified by the Parliament granting a timber harvesting right, except in the case of land with private forest plantations or lands with timber grown or owned by an individual or group.

APPENDICES

1. TUC Application Form
2. TUC Area Plan - approved format
3. TUC Operational Plan - approved format
4. Compartment Plan (On-Reserve); Annual Plan (Off-Reserve)
5. Logging Control Forms
6. Codes
 - 6a Species Codes and Felling Limits
 - 6b Locality Marks
 - 6c Forest Reserve Codes
7. Protected Species

APPENDIX 1

TUC APPLICATION FORMS

Form FS / CV1

Application for a Timber Utilization Contract

Timber Rights Eligibility Form

information supplied will be treated as
CONFIDENTIAL

Fee:.....

Receipt No:.....

Official Use Only:.....

Authorization.....

Validity.....

To be completed and forwarded to
THE HEAD OF THE TIMBER RIGHTS AND ADMINISTRATION UNIT
FORESTRY COMMISSION
P.O.BOX MB 434
ACCRA – GHANA

2. The Applicant

2.1 Company Name

2.2 Company Address

2.3 Description of the type of organization – private limited liability, partnership, individual, co-operative society, public corporation etc.

2.4 List of particulars of all owners and directors of the Company – name, address, shareholding

2.5 Give the name and address of the Company Banker (s)

3. Company Staffing

3.1 Give the names, qualification and work experience of all professional foresters

3.2 list all other professional staff

3.3 list the number and grades of all other staff employed by the company

4.0 Logging Capacity

4.1 List all the road construction and maintenance equipment and vehicles presently in use. State the make, year of manufacture, registration/identification numbers and date of purchase by the company.

4.2 list all felling and hauling equipment and vehicle presently in use. State the make, year of manufacture, registration/identification numbers and date of purchase by the company.

5.0 Timber Conversion or Processing Plant

- 5.1 Describe timber conversion or processing plant owned by the company
- 5.2 What is the installed capacity in cubic metres of log input per annum
- 5.3 What is the total production capacity in cubic metres output by product per annum
- 5.4 What is the present utilisation of installed capacity
- 5.5 What is the planned utilisation of installed capacity
- 5.6 Describe the plant production method and processes

6.0 Experience in the Timber Industry

- 6.1 Describe the company's previous timber industry experience
- 6.2 Describe any current concession leases or timber rights held inside forest reserves. Give the lease number, period of contract, area and expiry date.
- 6.3 Describe any current concession leases or timber rights held outside forest reserves. Give the lease number, period of contract, area and expiry date.
- 6.4 What has been the production of logs by the company from all areas within the last three (3) years. State the year, number of logs and volume in cubic metres
- 6.5 What have been the export sales by the company for logs and processed timber products within the last three (3) years. Describe the market and state volume (m³) and value in US\$ for each product type.
- 6.6 What have been the domestic sales by the company for logs and processed timber products within the last three (3) years. Describe the market and state volume (m³) and value in Ghana Cedi for each product type.

7.0 Attachments

7.1 Evidence of company incorporation under the Companies Code, 1963 or the incorporated Private Partnership Act, 1962

7.2 Business Plan for the company including a description of all company activities, resources and an income and expenditure statement for each of the last three years.

7.3 Income Tax and Social Security Clearance Certificates

7.4 VAT Clearance Certificate

7.5 Audited accounts for the company for the last three (3) years

7.6 Banker’s certificate or creditworthiness and details of any loans contracted

7.7 Evidence of full payment of royalties and levies

7.8 Evidence of membership of relevant trade association

7.9 Copies of vehicle insurance and road worthiness certificates for all vehicles owned by the company

7.10 Summaries of qualification and work experience for all professional forestry staff.

8.0 Declaration

8.1 I hereby confirm that the information given on this application form and the attachments hereto are true and current and to the best of my knowledge and that any false information supplied by me render this application and subsequent issue of timber rights null and void.

Signature of Applicant:.....

Date:.....

**APPLICATION FOR
A TIMBER UTILISATION CONTRACT**

Timber Rights Pre-qualification Form

*Information supplied will be treated as
CONFIDENTIAL*

TUC Identification No:.....

Location:.....

Fees:.....

Receipt No:.....

Official Use Only

.....
.....
.....

Authorization

Validity

To be completed and forwarded to:

THE SECRETARY
TIMBER UTILIZATION CONTRAT EVALUATION COMMITTEE
FOREST COMMISSION
P. O. BOX MB 434
ACCRA – GHANA

Notes for Applicants

The purpose of this Timber Rights Pre-qualification Form is to provide the TUC Evaluation Committee with a clear indication of the professional competence of those companies that have satisfied the basic screening process provided with Form FS/CV1. The correct completion of this form and the attachments will require the applicant to prepare a TUC plan and to demonstrate that they fully understand the terms of the timber operational specifications.

It is based on this form and the associated attachments together with records of the previous operational standards set by the company that the TUC Evaluation Committee will make recommendations to the Minister for Lands and Natural Resources for the award of the contract. The evaluation will be undertaken against defined criteria of technical, environmental, social, and financial nature.

1. The applicant

1.1 Company Name

1.2 Company Address

1.3 List any significant changes to Form FS/CV1

Staff:

Timber Conversion / Processing

Equipment

2. The Forest Reserve Management Plan (s)

2.1 You should have read the relevant sections of the Management Plan(s) sent to you. Are there any aspects that you feel are unclear or need amendment.

3. Timber Operational Specification

The Timber Operational Specifications (TOS) define the local constraints and controls that will apply in the contract. In section 15 of the TUC Area Plan you will be expected to comment on how you will ensure that these specifications are adhered to. Comment below, if you think that any of the specifications are unclear or you consider them to be unrealistic in any way.

Timber Operational Specifications – Comments on clarity and suitability

4. Land Owners

You will have been informed of the relevant land owners, district assemblies and traditional councils that have a bearing on this TUC. If you have made contact with some /all of these groups, has there been any discussion points or issues that you want to register now leading to possible problems.

Comments on discussion with land owners

Attachments:

1. TUC Area Plan is to be completed in accordance with the approved format and attached guidelines. Applicants are reminded that this will form the major part of this application and care should be taken over its preparation
2. Maps – as part of the TUC Area Plan, applicants are reminded that they must submit two maps:
 - a. Copy of the Compartment Map at a scale 1:50,000 or a suitable enlargement defining the compartment boundaries and extended to indicate the main access roads to be used during the contract period and expected location of main camps. Areas under protection should be clearly identified where they adjoin the timber production area. In the case of the TUCs off-reserve, individual compartments are not identified.
 - b. Enlargement of the base map to identify details of the first five coupe – suggested scale being 1:25,000 or greater. Map to show the expected position of log yards, base camp, new roads, bridges, and those roads to be maintained by the contractor. Protected areas with the coupe should be indicated.

APPENDIX 2
Timber Utilization Contract (TUC) Area Plan
Approved Format

The following is the approved format for the TUC Area Plan. Minor changes from the indicated layout are permitted depending on particular circumstances and the information to be presented.

The TUC Area Plan is an essential part of the approval process and must accompany the application together with Form FS/CV/2 and the attachments indicated as necessary on the form.

NO.	REQUIREMENTS	NOTES	DETAILS
1.	TUC Reference No.	Quote reference number given on advertisement	
2.	Location / Reserve	Extract information from advertisement	
3.	Name of Company	Operating name of company, please also provide current property mark	
4.	Intended start date	Earliest date that you would be able to commence operations	
5.	Expected finish date	Latest date for completion of operations	
6.	Gross area within contract (ha)	Information to be provided by FC	
7.	Areas to be excluded (coarse grained protection area) (ha)	Information to be provided by FC	<ul style="list-style-type: none"> i. Hill sanctuary..... ii. Swamps..... iii. Cultural sites..... iv. GSBAs..... v. Provenance areas..... vi. Shelterbelts..... vii. Fire buffer strips... viii. Convalescence areas..... ix. Conversion areas..... x. Admitted farms.....
8.	Net loggable area (ha)	Information to be provided by FC	
9.	Harvesting Schedule	Indicate the year that you plan to enter each of the compartments within the first five-year coupe and the expected commencement year for each of the other coupes (not individual compartment). Comment if you feel that there will be differences between your	<ul style="list-style-type: none"> i. Compartment No.:..... ii. Proposed Year of Entry:..... iii. Comments.....

NO.	REQUIREMENTS	NOTES	DETAILS
		schedule and that provided by the FC	
10.	Expected volume to be extracted by years for first five-year coupe only.	For the first five-year period indicate the expected volume to be extract by each year. The basic information from the baseline inventory as provided in the Management Plan should be referred to. Your expected yields should match the number of compartments to ne logged each year but will have to be based on the average volumes provided for commercial species from the inventory.	Year:..... Compartments:..... Expected yield.....
11.	Commercial species indicated as present in inventory that would not be extracted from first coupe of five years	List those species that you would be reluctant to remove at least for the first five years which are indicated as being present in the area. You should be aware that FC is anxious to promote the use of presently lesser-used species so you are advised to keep this list to the minimum	
12.	Equipment to be used for logging	List all the logging equipment that you intend to use for the first five-year coupe. If you intend to use all the equipment as listed in Section 4 of the Form FS/CV/1 then indicate “As for Section 4 Form FS/CV/1”	
13.	Supervisory and skilled staff available for logging operations by grades / titles	List all skilled staff (including drivers) and supervisors that you intend to use. FC does not want individual names but the number of staff available by grade or job description. i.e caterpillar drivers – 2, load operator – 1 etc	
14.	Expected labour requirements for first first-year period	Please, indicate the number of workers you intend to employ and will they be locally employed	

NO.	REQUIREMENTS	NOTES	DETAILS
15.	Do you intend to carry out stock survey yourself: (Yes / No)	The Stock Survey is carried out for each compartment prior to calculation of the approved logging yield. Indicate whether your company has the profession expertise to carry out this work itself or if you intend to employ FC staff (or a third party) for this task	
16.	Protection and controls proposed against illegal felling	Opening up logging tracks has the negative effect of allowing encroachment and illegal logging. Please list any particular controls that you intend to put into place for this or if you consider they will not be needed	
17.	Timber Operational Specifications: Detail the activities and controls to be put into place to meet the requirement of the TOS covering where relevant protection areas, fire control measures, environmental controls and the social responsibility agreements.	You must study in detail the Timber Operational Specifications provided with the contract. These indicate the particular local constraints and controls that are relevant and the social responsibility agreements that have been prepared in draft. You are expected to comment on these and indicate any sections with which you are unhappy or would have difficulty in fulfilling	
18.	Post-logging Activities: Details of activities to be carried out after completion of logging	Indicate the clearing up activities that you will undertake, following the completion of logging. You will be expected to remove all waste, clear drains and river courses (refer Section 5 of the Timber Harvesting Manual). Do you intend to carry out any planting?	
19.	Attached Maps: A copy should be made of the compartment map provided by FC suitably extended to show intended main access roads. For the first five-year coupe, a separate contoured	These are very important and two maps are needed. The first should be at 1:50,000 scale and should indicate the compartments and the five-year coupes. This information is provided by the FC, but	

NO.	REQUIREMENTS	NOTES	DETAILS
	<p>map (Survey of Ghana) of minimum scale 1:50,000 and preferably enlarged to 1:25,000 to be prepared to indicate in more detail road or track construction and special areas of management concern</p>	<p>you will be expected to indicate the main access roads you intend to make use of and any link roads that you intend to build. On the more detailed map which can be at a greater scale (and you are advised to obtain an enlargement of the Ghana Survey map) you will need to provide a better indication of the access roads to be built for the first coupe and the likely position of log yards etc. Details of the skid tracks are not expected as they can only be shown on the compartment maps following stock survey</p>	

7. Proposed Utilisation

a) To be converted by TUC holders (m³)

Product	Year 1	Year 2	Year 3	Year 4	Year 5
Plywood					
Composite boards					
Mouldings					
Flooring					
Others					

b) To be sold by TUC holders (m³)

Expected Customers	Year 1	Year 2	Year 3	Year 4	Year 5
1.					
2.					
3.					
4.					
5.					
Unknown					

8. Access Roads

All roads (existing) and proposed to be shown on a 1:20,000 – 1:50,000 map

Details of main access roads to be constructed

Start Point End Point Length Construction type

- 1.
- 2.
- 3.
- 4.
- 5.

Source of stone / sand / clay (indicate on map)

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9. Protection and Environmental Issues

Detail of measures to be taken to ensure adequate protection of coarse – grained protection area as per the TUC Area Plan

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10. Planned measures for fire protection

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11. Planned measures to limit illegal felling and encroachment

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12. Planned post – logging activities

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13. Summary of main features of SRA relevant to compartments covered under this Operations Plan

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Notes to Assist in Completion - Form 3a (On-reserve)

1. Quote TUC reference provided by the FC.
2. Name of reserve or reserves covered under the present five-year plan
3. Company name plus property mark.
4. The expected start and finish years for the operational plan – this should cover a five-year period in normal circumstances.
5. Provide details of the proposed entry date for each of the compartments assigned to the five-year coupe. In many cases, this will be based on an equal area to be harvested each year, however, if it is expected that there will be a slow start up period or ground conditions or stocking suggest that an equal area can not be harvested each year, then this may be indicated here.
6. You are asked to provide a breakdown of the commercial species that will be extracted. This information will be based on the information provided by FC in the management plan of the reserve. Species can be grouped in accordance with the coloured star system of scarlet (over-exploited species, highly commercial), red (generally commercial species), promotable pinks (species considered to be commercial but currently under-exploited) and other pinks (utilisable but currently of very little interest). A full list of the species according to this colour code is provided in Appendix 6a.
7. As much as possible, indicate the proposed utilisation of the timber. Fill in Table 7a if your company will be itself be concerned with log conversion. Note that the volumes to be entered refer to the volume of log input – not the quantity of the final product. Table 7b should be used where all or a proportion of the logs are expected to be sold on to a third party. In column 1 of this Table 7b, list the companies to which agreement has been reached or is expected to be obtained for the supply of material. It is fully expected that you will have to enter a progressively larger log output to the “unknown” categories in later years.
8. Access roads that will be used for the extraction of timber should be indicated on an accompanying map. You are recommended to obtain an enlargement (1:20,000) of the 1:50,000 survey map as a base. All proposed new roads should be clearly indicated. In Section 8 of the form, list the start and finish points of each of these new roads referring to either a well-defined location on the ground or a map reference point. Give the approximate length of the new roads and indicate the width and type of construction proposed. You should indicate on the map the expected source of road making material and name the source in Section 8.
9. Extract the relevant sections from the Timber Operational Specifications (TOS) pertinent to the area covered under this five – year plan. You need to demonstrate that you are aware of these areas and that they will be excluded from the timber production working circle.
10. List any special precautions to be given to fire control – this is especially important if the management plan has indicated there to be fire susceptible area.

11. Indicate if you intend to have your own staff controlling log movements.
12. List those activities you intend to carry out after felling – refer to the TOS for any special conditions that may apply to the area. You will be expected to scuffle and make good the logging yards, remove debris from water courses etc.
13. List those aspects from the Social Responsibility Agreement (SRA) that are particularly relevant to the area covered under this five-year plan. You may have made agreements with communities directly affected by the compartments to be logged.

Appendix 3b – Timber Utilization Contract Operations Plan (Off-reserve)

1. TUC Reference No..... 2. Location.....

3. Name of Company.....

4. Period covered by Plan.....

5. Area covered under this Operations Plan (description to be supported by 1:20,000 – 1:50,000 map)

6. District Assemblies, Chiefs, and Communities affected under this operations plan

.....

7. Indicative volume to be felled

Year	Volume (m ³) by species group				
	Scarlet spp.	Red spp.	Promotable Pinks	Other pinks	Total Volume

8. Agreements already reached for sale of logs

.....

9. Access roads

All roads (existing) and proposed to be shown on a 1:20,000 – 1:50,000 map

Details of main access roads to be constructed

Start Point	End Point	Length	Construction type
--------------------	------------------	---------------	--------------------------

- 1.
- 2.
- 3.
- 4.
- 5.

Source of stone / sand / clay (indicate on map)

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.....
.....
.....

10. Protection and Environmental Issues

Detail of measures to be taken to ensure adequate protection of any areas identified for special attention under the TUC Area Plan

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11. Planned post – logging activities

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.....
.....
.....

12. Summary of main features of SRA relevant to area covered under this Operations Plan

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.....
.....
.....
.....

Notes to Assist in Completion – Form 3b (Off – reserve)

1. Quote TUC reference provided by the FC.
2. Name of reserve or reserves covered under the present five-year plan
3. Company name plus property mark.
4. The expected start and finish years for the operational plan – this should cover a five-year period in normal circumstances.
5. Demarcate on a map – suitable scale being 1:20,000 – 1:25,000 taken from an enlargement of the 1:50,000 Survey of Ghana base map, the area to be included within the five-year operations plan. Also support with a description of the boundaries.
6. List those District Assemblies, chiefs and communities that are affected by the plan.
7. Indicate as much as possible the expected volume of species to be extracted over each year of the plan. The volumes should be grouped in accordance with the star system used for commercial species (Appendix 6). Information on the expected volumes will most likely come from the results of the low intensity inventory that was carried out of the off-reserve areas and will be amended in accordance with any regional and district quotas that have been given to the DM. You may need to consult the DM for assistance in filling this section.
8. List any existing agreements that have already been reached with millers to take your logs.
9. Provide a map of all access roads to be used for log extraction differentiating between existing and tracks to be constructed by your company. For those roads to be constructed or greatly improved by your company – indicate the start and finish position either by referring to an easily locatable point or a map reference point. Give the length of road / track to be constructed and also indicate the expected source of road making material.
10. Detail any particular aspects of the Timber Operational Specifications that are relevant to the area being considered with respect to environmental and protection aspects.
11. List any activities that you intend to carry out (if any) following the completion of logging.
12. List all the principal aspects from the Social Responsibility Agreement for those communities affected under this plan.

APPENDIX 4

Compartment Harvesting Plan

Approved Format

1. TUC Reference No..... 2. Reserve.....
3. Compartment..... 4. Area..... (ha)
5. Name of Company.....
6. Proposed Start Date..... 7. Proposed Finish Date.....
8. Other compartments (if any) proposed for entry in current calendar year.....
9. Modifications to planned yield to be extracted
.....
.....
.....
10. Road / track construction
Total length of semi-permanent tracks to be constructedkm
Total length of skidding tracks neededkm
11. Number of logyards
12. Attached Map to be prepared at a scale of 1:10,000 (or greater) derived from a Survey of Ghana 1:50,000 scale contour maps. The maps to indicate;
 - i. compartment boundary
 - ii. all protected areas to be excluded from the timber production area
 - iii. all water courses
 - iv. position of existing tracks and roads
 - v. all new tracks to be constructed
 - vi. log yards
 - vii. logging camps

Notes to Assist in Completion – Form 3b (Off-reserve)

1. Quote the reference number provided by the FC.
2. Please give as detailed description of the location as possible.
3. Total area within boundaries of the annual programme area.
4. 4-6 fill as appropriate
7. Summarise the number of trees that have been agreed for felling as per the Pre-felling Inspection Form.
8. Indicate the length of roads, tracks and skidding tracks to be constructed, their position must be clearly indicated on the accompanying map. Note that all skidding tracks must stop well short of water courses. Access roads that need to cross water courses should do so at right angles. The road alignment should be such that gradient in excess of 15% are avoided. All plans for tracks construction will need the full approval of affected communities and farmers. Any future deviations from the approved alignment will be regarded as an infringement and may lead to future restriction on operations
9. The attached map is the key requirement and should be prepared with care. The scale to be used should reflect the size of the area to be covered and the distribution of those trees for felling. The scale should be at least 1:25,000 and may need to be as large as 1:5,000 for particular areas where there is the need to show track layout with greater precision. These maps should be obtained as blow-ups from the 1:50,000 standard sheets produced by the Survey of Ghana
10. The Pre-felling Inspection Form is an integral part of the Annual Plan and must be appended to this form. Quote the reference number here.
11. Any new extraction tracks that need to be made must be fully agreed with affected farmers and their endorsement given here.

APPENDIX 5
LOGGING CONTROL FORMS

A. Tree Information Form

B. Log Information Form

C. Log Conveyance Certificate

D. Compartment Closure Certificate

E. Pre-felling Inspection of Trees Off-reserve

F. Felling Permit to Fell Trees Off-reserve

APPENDIX 5A – TREE INFORMATION FORM (TIF)



Original - Contractor's Copy

Forest Services Division

F C

TREE INFORMATION FORM 0010352



Company/Applicant _____

Properly Mark _____

Location _____

Reference No. (Permit/Pre-felling inspection/Yield) _____

Forest District	Locality Mark	Stool Landowner	District Assembly

Reserve Code	Stock Survey No OR Tree Count No	Cont. Tree No.	Species		Tree Length (m)	Diameter (cm)		Volume (m ³)
			Trade Name	Code		d ₀	d ₁	
	TOTAL:							

Summary

Species Code	Species trade Name	No. of trees recorded	Volume (m ³)
TOTAL:			

Range Supervisor's Name _____

Signature _____

Date _____

Contractor's Name _____

Signature _____

Date _____

APPENDIX 5B – LOG INFORMATION FORM (LIF)



Original - Contractor's Copy

Forest Services Division

F C

LOG INFORMATION FORM

0110001

Company/Applicant _____

Properly Mark _____

Location _____

Reference No. (Permit/Pre-Felling inspection/Yield) _____

Forest District	Locality Mark	Stool Landowner	District Assembly

Reserve Code	Stock Survey No OR Log Count No	Cont. Log No.	Species		Log Length (m)	Diameter (cm)		Volume (m ³)
			Trade Name	Code		d ₀	d ₁	
	TOTAL:							

Summary

Species Code	Species trade Name	No. of trees recorded	Volume (m ³)
TOTAL:			

Range Supervisor's Name _____

Signature _____

Date _____

Contractor's Name _____

Signature _____

Date _____

APPENDIX 5D – COMPARTMENT CLOSURE CERTIFICATE

FOREST RESERVE:.....

CMPT NO:.....

TIMBER RIGHTS HOLDER:.....

As an authorized officer of the Forest Service Division (FSD), the above checks have been made by me of the condition of the above compartment:-

- | | YES / NO |
|--|----------|
| 1. All streams and water courses have been cleared | |
| 2. No litter or other waste has been left on the site | |
| 3. All trees marked for extraction, have been duly removed | |
| 4. All logs have been taken from the compartment | |
| 5. Log yards have been ripped and camps have been removed | |
| 6. Remaining roads / tracks have been properly drained | |
| 7. Bridges and culverts have been left in original (or better) condition | |

I, therefore, accept that this compartment can be regarded as closed and should not be re-entered until the next felling schedule.

Name of Officer:.....

Date:.....

Signature:.....

Designation.....

APPENDIX 5E – PRE-FELLING INSPECTION OF TREES OFF-RESERVE

FORM CO 2 "A"

SA **0047952**

Forest Services  Division

PRE -FELLING INSPECTION OF TREES OFF- RESERVE

Applicant: _____

Concessionaire lease/contract Reference No. _____ Property Mark _____

OR Chainsaw Owner registration No., _____

Location: _____ Locality Mark _____

SUMMARY OF TREES INSPECTED FOR FELLING DURING PRE-FELLING INSPECTION

Tree Numbers	Stool	District Assembly	Unit Committee
Total number of trees: _____			

Reference Number of attached Inspection Forms _____

INSPECTION CARRIED OUT BY:

FSD Representative _____

Unit Committee Representative _____

Applicant's Agent _____

Other team members _____

INSPECTION DATE: _____

•Inspection Fee _____ cedis Receipt No _____

• this is a fee to cover FSD administrative costs; applicants should provide logistic support to inspection team directly

THIS IS NOT A PERMIT TO FELL TREES OR A CONVEYANCE CERTIFICATE

APPENDIX 5F – FELLING PERMIT TO FELL TREES OFF-RESERVE

FORM

CO3

FOREST SERVICES DIVISION

Applicant..... Registration No.....

Machine Operator Machine No.

Chainsaw Operator Registration No.

Pre-felling Inspection ref. No.

Purpose of the permit

Contract No.

Location.....

Forest District.....

SUMMARY OF TREES AUTHORISED TO FELL ON PERMIT

Tree Numbers	Stool(landowner)	Community Unit Committee	District Assembly
Total number of trees			

Ref numbers of attached forms.....
(detailing each tree authorized to fell)

Royalty/deposit paid.....Cedis Receipt No.

Other fee..... Cedis Receipt No.

THE TREES DESCRIBED ON THE PERMIT HAVE BEEN INSPECTED BY THE FOREST SERVICE DIVISION AND COMMUNITY REPRESENTATIVES AND APPROVAL FOR FELLING IS HEREBY GRANTED

Issued by Reference No.

Date issued Date permit expires

Date permit collected by the Forest Service from the operator.....

APPENDIX 6 - CODES

APPENDIX 6A – LIST OF MAIN COMMERCIAL SPECIES, THEIR CODES AND STAR (EXPLOITATION) CLASS

The table below lists the main commercial species and their current minimum diameter (breast height) for felling. The star class is used to define the level of over-cutting or undercutting of species. Scarlet-coded species are being cut more than 200% of the levels believed to be sustainable, greater restrictions therefore apply in their cutting. Red Star species are being cut at a level of more than 50% of the annual allowable cut (AAC) but less than 200%. Pinks are being cut at less than 50% of the approved AAC. The remaining listed species are currently being cut only in small quantities. The mean tree volume is provided for the interest, it is no longer used for the derivation of royalty, instead, every individual tree is separately measured.

LATIN	TRADE	FELLING LIMIT	SPECIES CODE	MEAN TREE VOLUME	STAR CLASS
<i>Azelia africana</i>	PAPAO	70	AFZ	6.8	RED
<i>Albizia adianthifolia</i>	ALBIZIA	70	ALA	8.6	PINK
<i>Albizia ferruginea</i>	ALBIZIA	70	ALF	14.6	SCARLET
<i>Albizia zygia</i>	ALBIZIA	70	ALZ	10.8	PINK
<i>Alstonia boonei</i>	SINURO	90	ABO	20.1	PINK
<i>Amphimas pterocarpoides</i>	YAYA	70	AMP	13.2	PINK
<i>Aningeria spp.</i>	ASAMFENA	70	ANR	15.8	SCARLET
<i>Anopyxis klaineana</i>	KOKOTE	70	ANO	9.7	PINK
<i>Antiaris toxicaria</i>	KYEN-KYEN	90	ANT	11.4	RED
<i>Antrocaryon micraster</i>	APROKUMA	70	AMI	12.4	RED
<i>Berlinia spp.</i>	BERLINIA	70	BER	7.7	PINK
<i>Canarium schweinfurthii</i>	CANARIUM	90	CAN	17.9	RED
<i>Ceiba pentandra</i>	CEIBA	90	CP	28.2	RED
<i>Celtis mildbraedii</i>	CELTIS	70	CEM	9.8	PINK
<i>Celtis zenkeri</i>	CELTIS	70	CEZ	9.8	PINK
<i>Chrysophyllum albidum</i>	AKASAA	70	CAI	9	RED
<i>Chrysophyllum subnudum</i>	ADASEMA	70	CSU	9	RED
<i>Copaifera salikounda</i>	ENTEDUA	70	COP	15	
<i>Cordia millenii</i>	TWENEBOA	70	CMI	11	
<i>Cordia platythyrsa</i>	TWENEBOABERE	70	CPI	11	
<i>Corynanthe pachyceras</i>		50		3.4	PINK
<i>Cylicodiscus gabunensis</i>	DENYA	70	CYL	16.3	PINK
<i>Cynometra ananta</i>	ANANTA	70	CYN	7.9	PINK
<i>Daniellia spp.</i>	SOPI	70	DO	20.4	SCARLET
<i>Dialium aubrevillei</i>	DUABANKYE	70	DIA	10.5	PINK

LATIN	TRADE	FELLING LIMIT	SPECIES CODE	MEAN TREE VOLUME	STAR CLASS
<i>Diospyros sanzaminika</i>	SANZA-MULIKA	70	DSM	6.2	
<i>Distemonanthus benthamian</i>	BONSAMDUA	70	DIS	11.4	RED
<i>Entandophragma angolense</i>	EDINAM	110	EA	22.7	SCARLET*
<i>Entandophragma cylindricum</i>	SAPELE	110	EC	22.5	SCARLET*
<i>Entandophragma utile</i>	UTILE	110	EU	22.5	SCARLET*
<i>Entandophragma candollei</i>	CANDOLLEI	110	ECL	31.9	SCARLET*
<i>Erythrophleum spp.</i>	POTRODOM	70	ERI	12.4	PINK
<i>Funtumia africana</i>	FUNTUM	70	FUE	5.7	
<i>Gilbertiodendron limba</i>	TETEKON	70	GIL	7.4	
<i>Guarea cedrata</i>	GUAREA	70	GC	10.4	RED
<i>Guarea thompsonii</i>	KWADWUMA	70	GT	10.4	RED
<i>Guibortia ehie</i>	ANOKYEHYEDUA	90	GE	9.1	SCARLET
<i>Heretiera utilis</i>	NYANKOM	50	HER	9.7	SCARLET
<i>Holoptelea grandis</i>	ONAKWA	70	HOG	8.9	SCARLET
<i>Khaya anthotheca</i>	MAHOGANY	110	KA	18	PINK
<i>Khaya grandifoliola</i>	MAHOGANY	110	KG	18	PINK
<i>Khaya ivorensis</i>	MAHOGANY	110	KI	18	RED
<i>Klainedoxa gabonensis</i>	KROMA	70	KLA	15.2	RED
<i>Lannea welwitschii</i>	KUMNINI	70	LAW	7.5	PINK
<i>Lophira alata</i>	KAKU	90	LOP	20.4	RED
<i>Lovoa trichilioides</i>	WALNUT	70	LOV	11.2	RED
<i>Mammea africana</i>	BOMPAGYA	70	MAM	9.5	PINK
<i>Mansonia altissima</i>	MANSONIA	70	MAN	11.1	RED
<i>Milicia excelsa/regia</i>	ODUM	110	MIL	17.9	SCARLET
<i>Millettia</i>	MILLETIA	70	MR	6.3	
<i>Morus mesozygia</i>	WONTON	70	MO	14	PINK
<i>Nauclea diderrichii</i>	KUSIA	110	NAU	22.3	SCARLET
<i>Nesogordonia papaverifera</i>	DANTA	50	NES	8.5	PINK
<i>Ongokea gore</i>	ONGOKEA	50	ONG	4.8	PINK
<i>Parinari excelsa</i>	AFAM	70	PAR	14.6	PINK
<i>Parkia bicolor</i>	ASOMA	70	PBI	12.2	PINK
<i>Pericopsis elata</i>	AFROMOSIA	110	PER	16.2	SCARLET
<i>Petersianthus macrocarpus</i>	ESIA	70	PET	8.8	PINK
<i>Piptadeniastrum africanum</i>	DAHOMA	70	PIP	10	RED
<i>Pterygota macrocarpa</i>	KYEREYE	50	PTM	15.4	SCARLET
<i>Pycnanthus angolensis</i>	OTIE	70	PYC	7.5	PINK
<i>Rhodognaphalon brevicupse</i>	BOMBAX	70	BBR	11	RED

LATIN	TRADE	FELLING LIMIT	SPECIES CODE	MEAN TREE VOLUME	STAR CLASS
<i>Rhodognaphalon</i>		70		9.3	PINK
<i>Ricinodendron heudelotii</i>	WAMA	110	RH	17.5	PINK
<i>Scottellia klaineana</i>	TIABUTUO	70	SCO	7.7	
<i>Sterculia oblonga</i>	STERCULIA	70	STO	7.3	
<i>Sterculia rhinopetala</i>	WAWABIMA	70	STE	7.4	PINK
<i>Sterculia tragacantha</i>	SOFO	50	CHA	5.9	
<i>Strombosia glaucescens</i>	AFENA	50	STR	3.4	PINK
<i>Terminalia ivorensis</i>	EMIRE	70	TI	13.6	SCARLET
<i>Terminalia superba</i>	OFRAM	70	TS	14.3	RED
<i>Tieghemella heckelii</i>	MAKORE	110	TIE	29.4	SCARLET
<i>Trichilia tessmanni</i>	TRICHILIA	50	TRH	4.6	PINK
<i>Trilepisium madagascarien</i>		70		7.2	PINK
<i>Triplochiton scleroxylon</i>	WAWA	70	TRI	21.2	SCARLET
<i>Turraeanthus africanus</i>	AVODIRE	70	TUR	7.5	PINK
<i>Zanthoxylum spp.</i>	OYAA	70	FAZ	7.2	

Those Scarlet Star species marked with an asterisk (*) are currently regarded as Restricted Timber species and could not be included within the normal yield without special permission of the Minister/Representative (refer to Appendix 7).

APPENDIX 6B – LIST OF FOREST RESERVES, CODE NAMES AND NUMBERS

The table below provides a list of forest reserves, their code names and numbers which may be used on various management and reporting forms.

RESERVE CODE	FMU	RESERVE NO.	DISTRICT	RESERVE NAME
		30	Assin Fosu	Asin Apinamin
AJUE		14	Assin Fosu	Ajuesu
OCHW	32	143	Assin Fosu	Ochi Headwaters Block II
BAKU	31	43	Assin Fosu	Baku
SUPG	31	175	Assin Fosu	Supong
WAWH	31	192	Assin Fosu	Wawahi
KRCH	32	111	Assin Fosu	Krochua
BIMP	32	54	Assin Fosu	Bimpong
OCHW	32	142	Assin Fosu	Ochi Headwaters Block I
TOTN	28	188	Asankrangwa	Tonton
FURI	10	90	Asankrangwa	Fure River
FRHW	10	91	Asankrangwa	Fure Headwaters
MAMI	10	120	Asankrangwa	Mamiri
ANGO	12	17	Asankrangwa	Angoben Shelterbelt
BURI	12	72	Asankrangwa	Bura River
TOSB	12	189	Asankrangwa	Totua Shelterbelt
BOSU	19	67	Bechem	Bosumkese
APSB	19	26	Bechem	Aparapi Shelterbelt
WORS	44	228	Begoro	Worobong South (Akim)
SSCP	44	167	Begoro	Southern Scarp (Akim)
DEDE	45	79	Begoro	Dede
WORN	45	230	Begoro	Worobong North (Akim)
APAM	40	25	Bekwai	Apamprama
BOSR	40	68	Bekwai	Bosumtwi Range
FMHW	40	89	Bekwai	Fum Headwaters
POHW	40	156	Bekwai	Pompo Headwaters
JERI	41	97	Bekwai	Jeni River
OBCA	41	222	Bekwai	Obuasi Catchment Area
ODRI	41	144	Bekwai	Oda River
DESB	41	80	Bekwai	Denyau Shelterbelt
SBSB	41	169	Bekwai	Subin Shelterbelt
SPSB	41	176	Bekwai	Supuma Shelterbelt
DAMR	41	78	Bekwai	Dampia Range
GREB	41	216	Bekwai	Greenbelt (Proposed)
NKRB	41	131	Bekwai	Nkrabia
ANHS	16	20	Bibiani	Anhwiaso South
ANHE	16	18	Bibiani	Anhwiaso East
UWAS	16	190	Bibiani	Upper Wassaw
SUMT	16	174	Bibiani	Sumtwitwi
TSUR	16	184	Bibiani	Tano Suraw
ANHN	16	19	Bibiani	Anhwiaso North

RESERVE CODE	FMU	RESERVE NO.	DISTRICT	RESERVE NAME
AFAH	16	7	Bibiani	Afao Hills
TSURE	16	184	Bibiani	Tano Suraw Extension
PRSU	24	159	Cape Coast	Pra Suhien Block I
PRSU	24	160	Cape Coast	Pra Suhien Block II
ANKF	25	21	Cape Coast	Ankaful Fuelwood
BRIM	25	71	Cape Coast	Brimso
KOMF	25	108	Cape Coast	Komenda Fuelwood
MPAM	22	125	Dormaa	Mpameso
PAMB	22	155	Dormaa	Pamu Berekum
BOWR	26	70	Dunkwa	Bowiye Range
OPMA	26	153	Dunkwa	Opon Mansi
BENE	27	47	Dunkwa	Ben East
BNBN	27	63	Dunkwa	Bonsa Ben
MINT	27	123	Dunkwa	Minta
TANI	11	181	Enchi	Tano Nimir
TANW	11	179	Enchi	Tano Anwia
JEAS	13	96	Enchi	Jema Assamkrom
BOTA	13	59	Enchi	Boi Tano
BORI	14	60	Enchi	Boin River
DIRI	14	82	Enchi	Disue River
DADI	14	77	Enchi	Dadiaso
YORI	15	200	Enchi	Yoyo River
TEHU	5	180	Enchi	Tano Ehuro
SUBM	20	168	Goaso	Subim
AYUM	20	42	Goaso	Ayum
BOBE	20	65	Goaso	Bonsam Bepo
ABSB	20	5	Goaso	Aboniyere Shelterbelt
BISB	21	49	Goaso	Bia Shelterbelt
BIAT	21	50	Goaso	Bia Tano
BONK	21	62	Goaso	Bonkoni
GOSB	21	93	Goaso	Goa Shelterbelt
BITW	6	51	Juaboso	Bia Tawya
BODI	6	58	Juaboso	Bodi
BIAS	7	202	Juaboso	Bia Tributaries South
SUKU	7	172	Juaboso	Sukusuku
KRHI	8	112	Juaboso	Krokosua Hills
MANZ	9	122	Juaboso	Manzan
BIAN	9	52	Juaboso	Bia Tributaries North
		229	Juaboso	Trans Bia
BHIL	37	44	Juaso	Bandai Hills
NBHL	38	132	Juaso	North Bandai Hills
ONYM	39	151	Juaso	Onyimsu
BOBR	39	57	Juaso	Bobiri
DOME	39	83	Juaso	Dome River

RESERVE CODE	FMU	RESERVE NO.	DISTRICT	RESERVE NAME
MIRH	39	124	Juaso	Mirasa Hills
NFOM	39	133	Juaso	North Fomangsu
PRAK	39	161	Juaso	Prakaw
SFOM	39	166	Juaso	South Fomangsu
KWKU	50	117	Kade	Kwekaru
JABE	47	94	Kade	Jade Bepo
JBEX	47	95	Kade	Jade Bepo Extension
AURI	50	40	Kade	Auro River
MARI	50	119	Kade	Mamang River
AJEB	50	13	Kade	Ajenjua Bepo
NSUE	50	137	Kade	Nsuansa
AYOL	50	12	Kade	Aiyaola
BEDI	50	45	Kade	Bediako
KAJE	50	104	Kade	Kajeasi
KANY	50	118	Kade	Kwesi Anyinama
ATEW	43	39	Kyebi	Atewa Range Extension
BOTF	44	69	Koforidua	Duaboti Falls
BOMF	38	61	Kumawu	Bomfoum
KRWA	38	113	Kumawu	Kronwan
ASON	38	32	Kumawu	Asonari
KUWS	38	220	Kumawu	Kumawu Water Supply
ANSU	39	23	Kumawu	Anumsu North
ANSS	39	24	Kumawu	Anumsu South
ATEW	43	38	Kyebi	Atewa Range
APED	44	27	Kyebi	Apedwa
AWRA	42	41	Mampong	Awura
ABRI	42	6	Mampong	Abrimasu
ABOM	42	4	Mampong	Aboma
CHIR	42	76	Mampong	Chirimfa
OFHW	42	146	Mampong	Ofin Headwaters
ONGW	42	148	Mampong	Ongwam Blocks I, II & III
DESI	21	81	Mankranso	Desiri
TOFN	35	182	Mankranso	Tano Ofin South
TIBE	35	186	Mankranso	Tinte Bepo
NSCW	46	135	Mpraeso	Northern Scarp West
NSCE	46	134	Mpraeso	Northern Scarp East
ABIS	46	2	Mpraeso	Abisu
WORN	46	194	Mpraeso	Worobong North (Kwahu)
ESUK	47	88	Mpraeso	Esukawkaw
KABE	47	103	Mpraeso	Kade Bepo
NKAW	47	129	Mpraeso	Nkawanda
SSCP	47	67	Mpraeso	Southern Scarp (Kwahu)
WORS	48	195	Mpraeso	Worobong South (Kwahu)
AFSB	40	8	New Edubiase	Afia Shelterbelt

RESERVE CODE	FMU	RESERVE NO.	DISTRICT	RESERVE NAME
CHIB	40	75	New Edubiase	Chiremoasi Bepo
KOSB	40	107	New Edubiase	Kokotintin Shelterbelt
KSBE	40	115	New Edubiase	Kunsimoa Bepo
NUMI	40	138	New Edubiase	Numia
NYAB	40	139	New Edubiase	Nyamibe Bepo
ONBE	40	149	New Edubiase	Onuem Bepo
ONSB	40	150	New Edubiase	Onuem Nyamibe Shelterbelt
JIMR	37	219	Nkawie	Jimira Extension
TOFN	35	182	Nkawie	Tano Offin North
OFSB	35	147	Nkawie	Ofin Shelterbelt
ASEN	36	29	Nkawie	Asenanyo River
JIMI	37	98	Nkawie	Jimira
PRSB	42	223	Nkoranza	Pru Shelterbelt
PRAN	39	157	Oda	Pra Anum
BEMU	49	46	Oda	Bemu River Blocks 1, 11 & III
BIEX	49	56	Oda	Birim Extension
BIRM	49	55	Oda	Birim
ESEP	49	86	Oda	Esem Epam
ESUB	49	87	Oda	Esuboni
OBOY	49	141	Oda	Oboyow
PRBI	49	158	Oda	Pra Birim North & South
ASUB	33	33	Offinso	Asubima
MANK	33	121	Offinso	Mankrang
AFHS	34	9	Offinso	Afram Headwaters
ASSE	34	34	Offinso	Asufu Shelterbelt East
ASSW	34	35	Offinso	Asufu Shelterbelt West
KWAM	34	116	Offinso	Kwamisa
OPRI	34	154	Offinso	Opro River
GIAN	34	92	Offinso	Gianima
AFBA	33	10	Offinso.	Afrensu Brohuma
ABOH	48	3	Somanya	Aboben Hills
ACHP	48	211	Somanya	Achimota Plantation
DECS	48	214	Somanya	Dechidan Stream
FIAS	48	215	Somanya	Fiankonya Stream
SASU	48	163	Somanya	Sapawsu & Extension
VLRI	48	191	Somanya	Volta River
YOGA	48	198	Somanya	Yogaga
YONG	48	199	Somanya	Yongwa
CHAT	48	213	Somanya	Chipa Tributaries
TATT	23	178	Sunyani	Tain Tributaries II
ANSB	17	16	Sunyani	Amama Shelterbelt
ASUK	17	36	Sunyani	Asukese
BOSM	18	66	Sunyani	Bosomoa
NSEM	18	136	Sunyani	Nsemere

RESERVE CODE	FMU	RESERVE NO.	DISTRICT	RESERVE NAME
SAWS	18	164	Sunyani	Sawsaw
TATO	18	177	Sunyani	Tain Tributaries
YAYA	18	196	Sunyani	Yaya
CAPE	3	73	Takoradi	Cape Three Points
INCH	25	218	Takoradi	Inchaban
SEKW	25	165	Takoradi	Sekondi Waterworks &
SBRI	51	170	Tarkoradi	Subri River
BENW	27	48	Tarkwa	Ben West
NKOB	27	130	Tarkwa	Nkonto Ben
DRRI	1	84	Tarkwa	Draw River
ERSB	1	85	Tarkwa	Ebi River Shelterbelt
NDUM	2	127	Tarkwa	Ndumfri
BNRI	3	64	Tarkwa	Bonsa River
TSUR	16	185	Tarkwa	Tano Suraw Extension
NEUN	2	209	Tarkwa	Neung North
NEUN	2	208	Tarkwa	Neung South
MURO	4	126	Wiawso	Muro
TSUH	4	183	Wiawso	Tano Suhien
SUHM	4	171	Wiawso	Suhuma
SANT	5	162	Wiawso	Santomang
SIRI	5	173	Wiawso	Sui River
AHIH	29	11	Winneba	Ahirasu Hills I & II
AKRH	29	15	Winneba	Akrobong Hills
ABAS	29	1	Winneba	Abasuma
MUMF	29	221	Winneba	Mumford Fuelwood
OBOT	29	140	Winneba	Obotumfo Hills
OPIM	29	152	Winneba	Opimbo Blocks I & I
SENF	29	224	Winneba	Senya Fuelwood
WINF	30	226	Winneba	Winneba Fuelwood
YENK	30	197	Winneba	Yenku

APPENDIX 6C – LIST OF LOCALITY MARKS

NO.	REGION	FOREST DISTRICT	LOCALITY MARK
1	Ahafo	Goaso	AH02
		Bechem	AH01
2	Ashanti	New Edubiase	AR09
		Bekwai	AR08
		Kumawu	AR04
		Mampong	AR03
		Nkawie	AR05
		Offinso	AR02
		Juaso	AR07
3	Bono	Sunyani	BR02
		Dormaa	BR01
4	Bono East	Kintampo	BE02
		Nkoranza	BE01
		Atebubu	BE03
5	Central	Cape Coast	CR05
		Dunkwa	CR01
		Winneba	CR04
		Assin Fosu	CR02
6	Eastern	Mpraeso	ER01
		Somanya	ER06
		Kade	ER02
		Oda	ER05
		Begoro	ER04
		Donkorkrom	ER07
7	Greater Accra	Tema	GR01
		Amasaman	GR02
8	Northern	Tamale	NR01
		Yendi	NR02
9	North East	Walewale	
		Gambaga	
10	Oti	Jasikan	OR01
		Nkwanta	OR02
11	Savanna	Buipe/Damango	SR02
		Bole	SR03
12	Upper East	Bolga	
		Navrongo	
		Bawku	
13	Upper West	Laura	
		Tumu	
14	Volta	Ho	VR01
		Denu/Sogakope	VR02
15	Western	Takoradi	WR02
		Tarkwa	WR03
		Asankrangwa	WR01

NO.	REGION	FOREST DISTRICT	LOCALITY MARK
16	Western North	Bibiani	WN01
		Sefwi Wiawso	WN04
		Enchi	WN02
		Juaboso	WN03

APPENDIX 7 – PROTECTED SPECIES

In addition to the identification of protected areas within the forest reserves, where no logging is allowed, there is a complete ban or a restriction on the felling of certain species – wherever they may occur – on or off reserve. The so-called Black Star species are those known to on high international interest and now only occurring in Ghana in restricted areas. Black Star species must not be felled under any circumstances and in fact during the process of stock survey all such trees will be marked on the stock maps and a 100-metre buffer zone enforced around them.

There is a separate class of protected species – called the Restricted Timber Species. These species can only be felled after obtaining special permission from the Chief Forest Officer. All such species will be excluded from the standard yield calculations. The tables below list these two classes of species: -

Table A7.1 Restricted Timber Species

Local Name	Trade Name	Botanical Name
Edinam	Gedu-Nohor	<i>Entandophragma angolense</i>
Penkwa	Sapele	<i>E. cylindricum</i>
Efobrodedwo	Utile	<i>E. utile</i>
Penkwa-akoa	Candollei	<i>E. candollei</i>
Krumben	Mahogany	<i>Kaya anthotheca/grandifolia</i>
Dubini Odum	Mahogany	<i>K. ivorensis</i>
Kusia	Iroko	<i>Milicia excelsa/regia</i>
Kokrodua	Opepe	<i>Nauclea diderrichii</i>
Baku	Afromosia	<i>Pericopsis elata</i>
Hyedua	Makore	<i>Tieghemella heckeli</i>
Edinam	Black Hyedua	<i>Guibotea ehii</i>

Table A7.2 Black Star Species

Botanical name	Flora type
<i>Afrostryax lepidophyllus</i>	Tree
<i>Albertisia cuneata</i>	Climber
<i>Alsodeiopsis chippii</i>	shrub
<i>Asplenium schnellii</i>	Herb
<i>Aubregrinia taiensis</i>	Tree
<i>Bonamia vignei</i>	Climber
<i>Bowringia discolor</i>	Climber
<i>Ceropegia gemmifera</i>	Climber
<i>Chrysoph. azaguieanum</i>	Tree
<i>Chytranthus verecundus</i>	Shrub
<i>Coffea togoensis</i>	Tree
<i>Cola umbratilis</i>	Tree

Botanical name	Flora type
<i>Commiphora dalzielii</i>	Tree
<i>Croton aubrevillei</i>	Tree
<i>Cyphostemma ornatum</i>	Climber
<i>Dactyladenia hirsuta</i>	Tree
<i>Dalbergia setifera</i>	Tree
<i>Dasylepis assinensis</i>	Tree
<i>Deinbollia saligna</i>	Shrub
<i>Dissotis entii</i>	Tree
<i>Eugenia coronata</i>	Shrub
<i>Gibertiod bilineatum</i>	Tree
<i>Grewia megalocarpa</i>	Climber
<i>Hippocratea vignei</i>	Climber
<i>Hunteria ghanensis</i>	Tree
<i>Hymenostegia gracilipes</i>	Tree
<i>Leucaniodiscus punctatus</i>	Tree
<i>Leptoderris miegei</i>	Climber
<i>Monocyclanthus vignei</i>	Tree
<i>Neoleonieria clitana</i>	Tree
<i>Nephthytis swanei</i>	Herb
<i>Oleandra ejurana</i>	Herb
<i>Pierreodendron kerstingii</i>	Tree
<i>Placodiscus bancoensis</i>	Tree
<i>Pseudagrostistachys africana</i>	Tree
<i>Psychotria aff. Calceata</i>	Shrub
<i>Psychotria ankasensis</i>	Shrub
<i>P. brachyanthoides</i>	Shrub
<i>P. dorotheae</i>	Shrub
<i>P.longituba</i>	Shrub
<i>P. subglabra</i>	Shrub
<i>Pteleopsis habeensis</i>	Tree
<i>Sapium aubrevillei</i>	Tree
<i>Sclerosperma mannii</i>	Herb
<i>Synsepalum aubrevillei</i>	Tree
<i>Talbotiella gentii</i>	Tree

Botanical name	Flora type
<i>Tapura ivorensis</i>	Tree
<i>Trichoscypha chevalieri</i>	Tree
<i>Turraea ghanensis</i>	Shrub
<i>Vernonia andohii</i>	Climber
<i>Elytraria ivorensis</i>	Shrub
<i>Ruellia togoensis</i>	Shrub