

# **Code of Practice for Forest Operations**

**For**

## **State Forest Authorizations:**

**Timber Sales Agreements, Wood Cutting License Holders, State Forest Exploratory Permits, State Forest Permissions, Community Forestry Management Agreements (SFA-TSAs, WCLs, SFEPs, SFP, CFMAs).**



**Guyana Forestry Commission 2018**

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# 1. INTRODUCTION

“Its overall purpose is to promote harvesting practices that will improve standards of utilization, reduce environmental impacts, help ensure that forests are sustained for future generations, and improve the economic and social contributions of forestry as a component of sustainable development.” (FAO Model Code of Forest Harvesting Practice, 1996).

## 1.1. Forests and their multiple functions

Forestry no longer focuses exclusively on the production of commercial timber. The importance of forests for biological diversity, non-timber products, cultural values and environmental services is now recognized worldwide; as a result forestry has become a more complex, more demanding discipline. One consequence of this increased complexity is that it requires more skills to plan and carry out forest harvesting operations, as these must be designed and implemented in ways that accommodate and, if possible, enhance the multi-resource character of the forest. To accomplish this, foresters, planners and logging operators require guidance on the practices that society is willing to accept and on the outcomes that are required in connection with forest harvesting operations.

Forests perform a number of functions that are important to our planet and to the survival of human communities and of many other organisms whose continued existence is in our interest. These functions are essentially ecological, socio-economic, and socio-cultural.

### Ecological functions

The forest environment has multiple attributes by virtue of its biodiversity:

- living environment for humans and the complex of animal and plant species;
- reservoir of genetic information;
- producer of biomass, fuel and minerals;
- regulator and stabilizer of the biosphere.

The need to conserve biodiversity and its attributes means that forest harvesting should not significantly change the different ecosystems encountered. Measures need to be taken to conserve and protect threatened species. Hunting and the extraction of forest products need to comply with relevant legislation and international agreements.

### Socio-economic functions

The continuity of a forest's socio-economic functions can be assured if it maintains its timber and non-timber production potential and, therefore, if the scale of utilization is strictly adapted to sustainable yield and regeneration capacity. Damage to the remaining stand and future crop trees must therefore be kept to a minimum. Another important key to success is involving local communities in the sustainable management process and in decision-making. They need to have a share in the revenue, have legal access to forests, and see an improvement in their living conditions.

### Socio-cultural functions

The socio-cultural functions of the forest needs to be maintained, particularly those associated with the cultural identity of local populations (e.g. customary rights and traditional, non-commercial uses, sacred trees, forests or sites and sites of archaeological interest). The negative impacts of forest harvesting need to be limited and mitigated by applying reduced impact logging practices.

### Reduced impact logging

Reduced-impact logging is integral to sustainable forest management. It is in fact a vital element as forest harvesting can have many negative impacts that partly affect forest regeneration and thus the potentially harvestable volume of subsequent cutting cycles. Furthermore, harvesting operations are activities which can be controlled most directly and easily by logging companies striving for sustainable management.

## 1.2. International context

There have been many significant developments in international policies related to tropical forests and forest management since 1990. These include the adoption of:

- The Convention on Biological Diversity (CBD) aimed at strategies and plans of action for the conservation and utilization of biological diversity and the integration of these objectives into sectorial policy;
- The Convention to Combat Desertification (UNCCD) aiming to forge a global partnership to reverse and prevent desertification and land degradation and to mitigate the effects of drought in affected areas in order to support poverty reduction and environmental sustainability;
- The Framework Convention on Climate Change (UNFCCC) aiming at stabilizing greenhouse gases at a level that will not disrupt the global climate;
- The Kyoto Protocol in 1996;
- The UNFCCC 'Cancun' decision on REDD+ in 2010; and

- The 2007 agreement on the Non-Legally Binding Instrument on all Types of Forests (NLBI; Resolution 62/98 of the United Nations General Assembly), which includes four globally agreed objectives on forests.
- International Tropical Timber Agreement 2011
- The Paris Agreement on Climate Change - 2015

Guyana has acceded to and ratified most Multilateral Environmental Agreements (MEAs).

There has also been a general shift in tropical forest management from a focus on timber towards holistic multi-purpose approaches that place increasing emphasis on forest services, REDD plus and verification of legality.

### 1.3. National legislative framework

Guyana has made significant progress in terms of development of legislation for promoting effective environmental management and protection and the sustainable use of Guyana's natural resources. The more relevant national legislation include:

- Environment Protection Act, Cap. 20:05;
- Mining Act, Cap. 65:01;
- Guyana Forestry Commission Act, Cap. 67:02;
- Forests Act, Cap. 67:01;
- Protected Areas Act, Act No. 14 of 2011;
- State Lands Act, Cap. 62:01

In terms of assurance of the socio-economic and socio-cultural benefits of sustainable forest management, the following among the national legislations are relevant for the Code of Practice for Forest Operations:

- Labour Act, Cap. 98:01;
- Occupational Health and Safety Act, Cap. 99:06;
- Prevention of Discrimination Act, Cap. 99:08;
- Amerindian Act, Cap. 29:01;
- Employment of Young Persons and Children Act, Cap. 99:01;
- Equal Rights Act, Cap. 38:01;
- National Insurance and Social Security Act, Cap. 36:01;
- Combating of Trafficking in Persons Act, Act No. 2 of 2005

The Forests Act (2009) stipulates in article 35 that the GFC may, at any time, submit to the Minister a proposed Code of Practice to regulate any class or description of forest operations. On receiving a proposed Code, the Minister shall publicly notify that a proposed Code has been submitted to him; the purport of the proposed Code; and the locations where the document may be inspected or bought.

A Code of Practice comes into force when its adoption is notified in the Gazette and shall be regarded as subsidiary legislation for the purposes of the Interpretation and General Clauses Act.

The GFC may, at any time, submit to the Minister a proposed amendment to any Code of Practice. If the Minister adopts the amendment, the amendment will come into force as if it were a Code of Practice.

No person shall carry out any forest operations in breach of a Code of Practice, the adoption of which has been notified in the Gazette.

#### 1.4. Objectives of the Code

This Code of Practice for Forest Operations provides a range of standards, guidelines and rules that will help concessionaires to adopt appropriate practices. Its aim is thus to function as:

- an effective instrument for the implementation of sustainable management of Guyana's forests;
- a compendium of guidelines that will facilitate forest activities compatible with international directives and principles, regional criteria and indicators, and the GTLAS and WTS;
- a series of guidelines that will help conserve biological diversity, forest regeneration and wildlife protection;
- a tool for promoting enhanced productivity, sustainability and economic viability of forest harvesting;
- a tool for promoting improved living conditions and safety of the workforce; and
- a tool for promoting improved relations between logging companies and local communities.

The Code concentrates more on “what needs to be done” than on “how this needs to be done”, and all of the principles will not be directly applicable to all situations, given their number and variety. The Code nevertheless lays down important general principles for environmentally sound forest harvesting for all State Forest Authorisations (SFAs). It is also accompanied by guidelines which detail the specific activities to be undertaken to achieve each principle.

The Forestry Training Centre Incorporated (FTCI) provides training in environmentally sound forest harvesting as well as forest harvesting techniques and the proper use of harvesting tools and equipment.

#### 1.5. Guyana's Forest Resource

The total land area of Guyana is 21 million hectares, of which 18.45 million hectares are forested. Therefore, 87 % of the country's land resource is covered by forests. Of this area, 12.56 million hectares is State Forest administered by the Guyana Forestry Commission. These forests are classified as swamp forest on the coast and rain forest, seasonal and dry evergreen forest in the interior.



The forests of Guyana are valuable reservoirs of biodiversity and provide home to approximately 8,000 plant species and in excess of 1,000 species of terrestrial vertebrates. A high proportion of the forests of Guyana is pristine (the forests of the Guiana Shield have been recognized as one of the last remaining “frontier forests” of the world), they contain many animal and plant endemics (it is estimated that 5% of all flora species in Guyana are endemic); these forests provide numerous habitats for wildlife, and freshwater ecosystems further enhancing the value of these forests. In addition, the forests provide other ecological services: the regulation of water regimes by intercepting rainfall and regulating its flow through the hydrological system; the maintenance of soil quality and the provision of organic materials through leaf and branch fall; the limiting of erosion and protection of soil from the direct impact of rainfall; and modulating climate.

In addition to the range of ecological services that the forests provide, the timber which the forests yield for housing and industry, and the non-timber forest products assist in the country’s social and economic growth and development. For instance, over the past 5 years, the annual forestry sector’s primary contribution to Guyana’s Gross Domestic Product (GDP) has been between 2% - 4%, with annual production ranging between 350,000 m<sup>3</sup> – 530,000 m<sup>3</sup>, earning annual foreign exchange ranging between 39 million and 54 million US dollars. The average number of persons directly employed in the forest sector over the past 5 years is 20,000 persons. Forestry contributes to employment mainly in the rural and hinterland areas. The forest industries sub-sector consists of mainly logging and sawmilling operations with wide ranging characteristics. For example, the capital requirements of the sector range from very low to very high; its technological requirements range from very simple to very sophisticated; and forest industries may be either labour or capital intensive. Forests are also used for agriculture, research, ecotourism, Amerindian reservations, conservation and protected areas and biodiversity reserves.

Forests also provide socio-cultural services. They are an integral part of Indigenous culture, with communities using the forest resources as a source of food, building materials, fibres for textiles and weaving, medicine, tannins and dyes. In addition, several communities are involved in commercial harvesting and utilization of forest resources.

#### 1.6. Role of Guyana’s Forest in Climate Change Mitigation

In an effort to address the development challenges of Guyana and simultaneously continue on this low path of deforestation and forest degradation, which would contribute to combating global climate change, Guyana formulated a Low Carbon Development Strategy (LCDS). The LCDS sets out the national conditions under which Guyana would:

- i. put its rainforest under long term protection once the right economic incentives are created; and
- ii. use the payments received for forests climate services to re-orient the country’s economy onto a low carbon, environmentally sound trajectory.

On November 9<sup>th</sup>, 2009, the Governments of Guyana and Norway signed a Memorandum of Understanding (MOU) where Norway committed to providing financial support for results achieved by Guyana in limiting emissions from deforestation and forest degradation.

Guyana has also launched its Green State Development Strategy (GSDS). This strategy will guide Guyana's economic and sociocultural development over the next 15 years. The Strategy encompasses inclusive green economic and social growth, provides a roadmap for achieving sustainable development goals and related targets, and outlines a long term vision for a prosperous and equitable future. The objective of the strategy is to re-orient and diversify Guyana's economy, reducing reliance on traditional sectors and opening up new sustainable income and investment opportunities in higher value adding and higher growth sectors.

#### *Revision of the National Forest Policy Statement 2018*

The enactment of the Forests Act in 1953 established it as the primary instrument, which regulated the management of the nation's forest resources for over five decades. However, changes in Guyana's economic, social and administrative environment from the 1950s, particularly resulting from the achievement of independent status of Guyana in 1966 and international influences emanating from the Earth Summit in Rio de Janeiro in 1992, have engendered greater appreciation of the expansive value of Guyana's forest resources. This has necessitated the revision of the goals, methods, and instruments (legislation and guidelines) that are being used in the development of the forestry sector.

Guyana's National Forest Policy Statement (NFPS) was revised in 2018 with an accompanying framework document, namely the National Forest Plan 2018. While the Statement outlined the national goals and ideals for the sustenance and use of the forest resources, the National Forest Plan provided the methods by which these broad objectives would be pursued and achieved.

The National Forest Policy is a shared vision for a country's forests and their use, both now and in the future. It outlines the goals, objectives and strategies for achieving this vision, while being flexible enough to adapt to emerging issues.

Guyana's National Forest Policy covers the period 2018 to 2028, and will be reviewed in 2023 at the halfway stage. This National Forest Policy Statement (NFPS), and associated National Forest Plan (NFP), reflect Guyana's movement away from valuing forests simply for their wood, and instead treats them as a cornerstone of the country's national patrimony; providing a host of products and services necessary to achieving the good life.

Of course, an NFPS that goes beyond the timber industry can only be effectively implemented by multiple actors, across different sectors and institutional scales.

## 1.7. Guyana Forestry Commission

The Guyana Forestry Commission (GFC) is a semi-autonomous organization entrusted with the mandate to ensure that Guyana's forest resources are sustainably managed and conserved. The GFC's main responsibility is policy implementation, sustainable forest management, community forestry, and planning the effective utilization of Guyana State Forest Resources. With regards to private lands, the GFC works with the management structure of private lands to assist in areas of forest activities. The GFC oversees the activities of the REDD Secretariat which is responsible for the implementation of REDD + activities.

The GFC also has a development mandate to ensure that there is a balance among the pillars of social, economic, and environmental development. The Forests Act 2009 outlines these pillars and highlights key legislative requirements for the Commission's work. Over the past decades, GFC has undergone rapid development in the implementation of sustainable forest management, legality, and environmental standards.

Community Forestry has been an important part of the GFC's work programme over the past 15 years. Many communities have come to depend on the forest for their main source of livelihood and for income generation. The GFC's efforts in community forestry have focused on formalizing the establishment of community groups into legally constituted Associations, assisting them in providing relevant training needs, overall support to their practices of sustainable forest management, and fostering sustainable development of the community forest resources as a whole. Some of the main areas of community development have been directed towards governance and decision-making, financial management, movement of community forest operations along the value chain, marketing and trade, capacity building and training in key areas, and sustainable utilization of forest resources.

### Forest Monitoring

Guyana has maintained a robust and continuously improving system of forest monitoring and regulation in the forest sector, resulting in maintained low rates of illegality, an environment where there is an inherent deterrent to illegal activities, systems of reporting and monitoring that lend to the fulfilment of most, if not all elements, of an effective chain of custody management system of forest products from the point of harvest to export, and a system that allows for verification of legal origin of forest produce. These have been enabled over the years by the strengthening of the institutional framework, whilst also supporting the sector.

Key monitoring tools are in place including the log tracking system, guidelines for concession level and environmental monitoring. GFC has several forest monitoring stations located at strategic control points throughout the country and many additional mobile monitoring units. Guyana is also using its existing robust management and monitoring system to finalize a Guyana Timber Legality Assurance System (GTLAS). This system will be the basis of engaging with relevant international and regional partners as the country advances efforts to promote legality of timber products.

## Forest Resources Management

The GFC is responsible for the administration and management of all State Forest land. The work of the Commission is guided by a National Forest Plan (2018) that has been developed to address the 2018 Forest Policy. The Commission develops and monitors standards for forest sector operations, develops and implements forest protection and conservation strategies, oversees forest research and provides support and guidance for forest education and training to promote sustainable forest management (SFM).

SFM practices implemented by the GFC include the following:

1. Submission of Forest Management Plans (FMP) and Annual Operational Plans (AOP) – required for large concessions.
2. Development of Guidelines to assist in the preparation of the FMPs and AOPs- for large concessions.
3. Control of harvesting through the implementation of Annual Allowable Cuts, Annual Allowable Area, quota allocation and various guidelines for compliance with best practices.
4. Post-harvest assessments.

The main forest enforcement guidelines and activities implemented by the GFC include the following:

1. National Log Tracking System
2. Legality Monitoring and Assessment
3. Concession level and Environmental Monitoring
4. Removal control documentation system

### 1.8. Development of the Code

The Code of Practice for Forest Operations contains the general principles which were developed, based on on-going research and practical experience locally and abroad over a period of two decades with a first draft of the Code produced in 1994. After intense consultations with key stakeholders, the draft Code of Practice for Forest Operations was first implemented on a voluntary basis in October 1998.

The first edition was extensively reworked in 2001 taking into account the results of experience, research, and independent reviews; most notably a field test of the draft Code carried out by the internationally recognized research organization, Tropenbos in collaboration with the Iwokrama International Center (IIC) and the GFC.

This updated Code of Practice for Forest Operations takes into account the general principles that SFAs should comply with based on on-going research and practical experience locally and abroad over a period of 20 years. It is based on extensive stakeholder engagements over the last 4 years.

## 1.9. Scope

Specific aspects of the Code of Practice for Forest Operations apply to both large and small concessions, whilst some aspects apply specifically to Large Concessions, or Small Concessions.

Associated with the Code are guidelines which are specific to Large Concessions, and to Small Concessions.

## 1.10. Verbal forms for the expression of provisions

[Adapted from ISO/IEC Directives Part 2: Rules for the structure and drafting of International Standards]

“*shall*”: indicates requirements strictly to be followed in order to conform to the standard.

“*should*”: indicates that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required.

“*may*”: indicates a course of action permissible within the limits of the document.

“*can*”: is used for statements of possibility and capability, whether material, physical or causal.

## 2. SUSTAINABLE MANAGEMENT OF PRODUCTION FORESTS

Sustainable forest management is “the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems”. (Ministerial Conference on the Protection of Forests in Europe, 2011)

“One basic condition for forest management is the conservation of the forest cover itself as well as the conservation of its capacity to satisfy all different kinds of exigency from the society. Besides that, also the long term, required for forest production, and the strong pressure of other sectors on the forests, make a careful short and long term planning indispensable...” (FAO Forest codes of practice - Contributing to environmentally sound forest operations, 1996)

### 2.1. Planning sustainable management and forest harvesting

The key objective of managing production forests is to secure a balanced, regular and sustainable harvest of forest products by deploying reduced-impact logging (RIL) practices that are well planned and prepared within a permanent forest area, while at the same time ensuring maximum conservation of forest resources and safeguarding their social and ecological functions.

Furthermore, forest management should:

- provide social, technical and financial benefits to all actors and should therefore be agreed to by all stakeholders: forest owners, logging companies and local communities;
- help decision-making by shaping practical, realistic and feasible programmes of action;
- take into account the multi-functionality of forests.

Forest utilization should respond to:

- national legal and regulatory obligations;
- the ecological constraints of sustainable ecosystem management, notably the optimal protection and conservation of diversity of flora and fauna;
- the socio-economic requirements of the areas concerned;
- the constraints of commercial profitability in the context of international trade.

At company level, forest utilization should ensure the continuity of forest resources and sustained supply of raw material.

## 2.2. Forest Management Plan (FMP):

*Applicable to Large concessions only (SFA-TSA/WCL/SFEP)*

Forest management planning considers planning horizons of differing duration and strategic importance.

- The Forest Management Plan (FMP): the medium-term document detailing the operations and activities to be carried out during successive approximate 3-5 year periods, this FMP is included as an update to the strategic management plan;
- The Annual Operations Plan (AOP) or coupe through which the management plan is programmed, implemented and monitored annually. This is the tool for the everyday management of harvesting.

### 2.2.1 *Objectives of Forest Management Plans*

All large concession holders shall submit a Forest Management Plan (FMP) to the GFC, which shall be updated every 3-5 years. The Forest Management Plan should be based on a detailed social, economic and environmental appraisal, setting out the order and extent of all activities to be carried out in a concession. The Forest Management Planning requirements of the GFC are designed not only to help the concessionaire address all the aspects of timber production and to accomplish objectives; but also to demonstrate to the GFC (and to financiers) that he/she is aware of all the variables and is prepared to make the necessary resource inputs to make timber production sustainable.

The Forest Management Plan is designed therefore to achieve the following objectives:

1. To establish the administrative capacity to manage the plan area
2. To describe and evaluate commercial potential of the forest resources in the plan area
3. To protect fragile land on steep slopes, protecting water supplies and protecting the forest's wildlife and biological diversity in general
4. To obtain local community support for forest management
5. To optimize revenues compatible with both the sustained production of timber and the socio-economic well-being of local communities
6. To sustain the supply of other forest products and services
7. To identify specific skills and capacity building requirements necessary for the management of the forest thus creating employment opportunities
8. To lend support to research investigations; this will in turn support the objectives of management.

The Forest Management Plan Guidelines outline the information that is required to prepare the plan.

### *2.2.2 Calculation of Cutting Cycle and Allowable Cuts*

The Annual Allowable Cut (AAC) is calculated from the best information available on the resource available for production in that area, the average volume available per productive hectare, and the cutting cycle. The maximum harvesting intensity is set at 20 m<sup>3</sup> per hectare per cutting cycle of 60 years, pending studies into the economic implications of this volume. Inversely, to sustain a 40, 30 or 25-year cutting cycle, a maximum cut of 13.33, 10, or 8.33 m<sup>3</sup>/ha is suggested for each cut respectively. Refer to the Guidelines for Forest Operations (Large Concessions) for AAC Calculation Procedure.

Volume of timber approved for removal from blocks for large concessions are assigned based on the Company's Maximum Allowable Cut (MAC) which is the lower volume figure of the Annual Allowable Cut (AAC) and the Inventoried Volume from the 100% pre-harvest inventory information (stock maps and data sheets).

Categories of blocks that may be approved for harvesting are: new blocks, rollover blocks, re-entry blocks, and advance blocks. Details are provided in the Guidelines for Forest Operations (Large Concessions).

## 2.3. Annual Plan of Operations for Timber Harvesting:

*Applicable to Large concessions only (SFA-TSA/WCL/SFEP)*

### *2.3.1 Outline of information requirements for an Annual Plan of Operations*

Besides the long-term forest management plan, which has to be updated approximately every 3-5 years, TSA and WCL holders shall submit an annual plan of operations to the GFC that sets out the main activities to be undertaken in the upcoming calendar year. The Annual Plan of Operations Guidelines for Timber Harvesting shall be applied when submitting an annual plan. A review of the previous year's activities is required in order to complement the upcoming year's plan.

The Annual Plan of Operations focuses mainly on the results of the 100% pre-harvest inventory of the AAA (Annual Allowable Area) that is established as blocks, the work planned for the coming year including 100% pre-harvest inventory, proposed harvesting and infrastructural operations and social issues to be addressed; and a review of the work carried out in the previous year:



2.3.2 *Review of work carried out in previous year must include:*

- Area (ha) logged by compartment and by block.
- Information to be tabulated and also indicated on a 1:50,000 scale topographic map sheet
- Number of trees and volume (m<sup>3</sup>) harvested per species by compartment and by block
- Mean annual volume harvested per hectare (m<sup>3</sup>/ha)
- The results of the 100% pre-harvest inventory of the area authorized for harvesting in one year according to the 3-5 year FMP (annual allowable area), data to be tabulated per block and the AAA and indicated on a 1:50,000 map
- A summary of results of the 100% pre-harvest inventory per block
- Road construction or access and maintenance completed (km), and indicated on a 1:50,000 map
- Waterway access indicated on a 1:50,000 map
- List of employees and work related accidents
- Base camps/forward camps erected and indicated on a 1:50,000 map
- Describe the status of any community or regional initiatives

*Work planned for the coming year must include:*

- A breakdown of the AAC calculation shall be provided in all Annual Operating Plans (see Guidelines for Forest Operations (Large Concessions)).
- Detailed harvest planning for the blocks to be harvested in the coming year at the level of the annual coupe or AAA, including tree locations, planned skid trails and log markets (landings)
- Area (ha) to be logged by compartment and felling block, indicated on a 1:50,000 map including number of trees and volume (m<sup>3</sup>) expected to be felled per species
- Road construction or access and maintenance to be completed (km), and indicated on a 1:50,000 map
- Detailed harvesting map at 1:10,000 - 1:2,500 scale, presenting tree locations, planned skid trails and log markets (landings)
- Base camps/forward camps to be established, indicated on a 1:50,000 map
- Forest inventory works planned for the coming year, blocks to be indicated on a 1:50,000 map
- Plans for the demarcation of concession boundaries on the ground and posting of signboards
- List of all records and registers to be maintained
- List of machinery and equipment to be used
- Plans for the monitoring of the concession area
- Plans for waste disposal/management produced during processing (at base camp, log markets, workshop, sawmill)
- List social issues to be addressed in current year, such as number of workers employed, contractors and sub-contractors, if any; procedures for occupational health & safety; training planned for employees; outreach programmes with nearby communities; public awareness programme on the company; etc.

## 2.4. Calculation of Quota

*Applicable to small concession holders*

For small concessions, the GFC has estimated limits at approximately 10 trees felled (20 cubic metres maximum) per hectare with a cutting cycle of 60 years. Allowance will also be made for non-productive areas, e.g. swamps, slopes etc. Initially, the GFC assumes that 80% of the area is accessible for harvesting. More details are provided in the Guidelines for Forest Operations (Small Concessions).

### 3. TRANSPORT DOCUMENTS AND LOG -TRACKING SYSTEM

“In Guyana, encouraging verification of legality in forest operations has been a priority at the national level. As the demand for tropical timber grows, and at a time when increasing pressure is being placed on natural tropical forests, Guyana has positioned itself to take on the challenge of providing verification of the origin of all timber products harvested from its forests”. (ITTO Tropical Forest Update 17/2 - 2007)

#### 3.1. The Log-Tracking System

The log-tracking system in Guyana was introduced in 2000 to verify the origin of raw material and to control the level of harvesting within State Forests providing detectable evidence on the legitimacy, geographical location, and magnitude of forest operations. The log tracking system is regulated by the use of log tags, which are assigned to SFA operators for the trees to be felled in the blocks that are proposed to be harvested in the operational year (for large concessions); and for trees to be felled in small concessions in accordance with the GFC allocated quota. The quota is equated to the approximate number of standing trees which will yield the volume; the number of trees computed gives an estimate of the number of tags to be issued (one tag is equivalent to one tree).

Log tagging is done at stump where half of the tag is affixed to the stump at the time of felling and the other part bearing the same sequence of numbers as recorded on the stump tag is affixed to the produce being conveyed. All forest produce including logs, lumber piles, poles and posts with the exception of the minor forest products (e.g. charcoal, spars, and wattles) are tagged. It is the unique number on tags assigned that indicates who the operator is and gives an indication of the geographic origin of the forest produce within the forest estate.

GFC administrative control and monitoring of the log tracking system is facilitated by a computerized database and its forest stations and other forest officers who are supplied with a register of log tag allocation by district. The system is supplemented by the use of operators' production registers, which are reviewed to ensure specifications of forest produce recorded on the removal permit are authentic.

#### 3.2. Infrastructural Tags

Infrastructure can be defined as any road, bridge, culvert or building within a specific concession or leading to a concession area. Log tags issued for infrastructural purposes shall follow the same procedures as those issued under the normal tag issuance system. Tags issued for infrastructural purposes will not affect the quota of the concessionaire, since the produce are intended for construction activities within the concession, or salvaging useable produce.

The requirements related to the issuance of infrastructural log tags are outlined in the Guidelines for Forest Operations (both large and small concessions).

### 3.3. Production Register

A Production Register accompanies a removal permit, it shall be used to provide extensive details of the information required in the Guidelines for Forest Operations (for both large and small concessions).

### 3.4. Removal Permit

Removal Permits are only issued to authorized individuals, once an active concessionaire is ready to transport forest produce beyond his/her demarcated boundaries. Thereafter the concessionaire shall follow the procedures outlined in the Guidelines for Forest Operations (for both large and small concessions).

### 3.5. Transshipment Permit

Transshipment Permits are used to facilitate the transporting of forest produce, where the Removal Permit was surrendered to a Forest Station and royalty paid.

### 3.6. Trip sheet

Trip Sheets are issued in connection with a Removal Permit, it must be used the same period as the removal permit and expires when the removal permit expires.

## 4. PRE-HARVEST PLANNING (Large Concessions)

Pre-harvest planning is an essential component of Reduced Impact Logging. It involves a detailed assessment of the timber stock and terrain conditions in the blocks which the concessionaire is allowed to harvest annually. A schedule for the planning and implementation of harvesting operations must be done as described in the Guidelines for Forest Operations (large concessions).

### 4.1. Objectives of and topics involved in Pre-Harvest Planning

The objectives of pre-harvest planning are:

- To reduce harvesting damage for enhanced protection of the environment;
- To allow well-organized and economical forest harvesting;
- To plan harvesting operations on an annual level;
- To compile and analyze all biological, topographical, drainage and socio-economic data required for the preparation of harvesting operations.

### 4.2. Geographic Information Systems (GIS)

Maps produced from remote-sensing, other geo-referenced data and data from the management level inventory and pre-harvest inventory can be digitized and fed into the GIS. These data can be:

- thematic maps (vegetation and forest types, geology, soils, etc.) or existing topographical maps;
- concession boundaries, compartments and harvesting blocks;
- GPS tracks and marked points; such as primary and secondary roads, skid trails, base camp and forward camps, wharfs, etc.;
- Ground observations.

### 4.3. Pre-harvest inventory

#### 4.3.1 *Objectives of the pre-harvest inventory*

A pre-harvest inventory is an intrinsic prerequisite of Reduced Impact Logging and a mandatory requirement for all large concessions. The pre-harvest inventory operation does not only serve to provide data on the commercial timber stock in terms of volume and numbers, but also on the location of the harvestable trees.

The objectives of a pre-harvest inventory therefore are:

- to quantify and qualify available volumes by species, and to identify trees in the annual harvesting area or coupe;
- to organize and optimize the coordination of harvesting activities, the use of the production and marketing capacity, and to improve control over operations;
- to optimize the layout of the secondary road network, skid trails and log markets (landings);
- to facilitate reduced-impact harvesting and thus limit damage to the environment;
- to facilitate detailed mapping of the location of trees to be harvested and trees to be protected, mapping of topographic details including the drainage system and zones that should be excluded from logging.

The pre-harvest inventory operation shall meet the requirements as listed in the Guidelines for Forest Operations (large concessions). Although small concessions are not required to conduct a 100% pre-harvest inventory, it is worthwhile to conduct some amount of planning prior to the harvest operation. As such, some of the following sections may also apply to small concessions.

The GFC will upon request, conduct assessments of concession areas that have high levels of active mining and based on the percentage of the block impacted by mining, the requirement for conducting 100% inventory and subsequent GFC verification prior to harvesting is reviewed.

#### 4.3.2 *Results to be produced by the pre-harvest inventory*

- Tree location map
- Summary table of available timber stand and stock

#### 4.4. Non-harvest areas

For large concessions, the thorough survey of the annual coupe during the pre-harvest inventory makes it possible to locate and demarcate areas to be excluded from harvesting including watercourses, buffer zones. These zones shall be clearly marked on the tree location map and highlighted in the pre-harvest inventory in accordance with the Guidelines for Forest Operations (large concessions).

For small concessions, consultation of topographic and forest type maps and a thorough ground survey of the area make it possible to locate and demarcate areas to be excluded from harvesting. Areas that shall be excluded from harvesting are specified in the Guidelines for Forest Operations (both large and small concessions)

##### 4.4.1 *Felling restrictions*

Restricted trees and/or species are described in the Guidelines for Forest Operations (for both large and small concessions) and shall not be felled without special permission.

#### 4.4.2 *Trees to be protected during harvesting*

A “keystone” or “cornerstone” species is a species that has a disproportionately large effect on its environment relative to its abundance. Such species play a critical role in maintaining the structure of an ecological community, affecting many other organisms in an ecosystem. A concessionaire shall not fell, injure, or kill any protected species without special permission. Trees that should be protected during harvesting belong to roughly five groups:

- Trees belonging to keystone species.
- Trees that may be felled but a predetermined quantity must remain
- Potential crop trees
- Heritage trees
- Seed trees

#### 4.5. Planning and optimizing the secondary road network

The pre-harvest inventory provides all the information required for:

- optimizing the layout of the secondary road network (pre-harvest inventory also provides location of trees, which information can be used when planning secondary road works);
- identifying and marking of trees that are considered harvestable based on species and quality;
- planning the layout of skid trails and log markets (landings) network and optimizing realization on the ground;
- deciding on the company’s commercial annual programme: species to be harvested, volumes, quality gradients and harvesting schedule.

##### 4.5.1 *Layout of the secondary road network*

An efficient and low-cost transportation network is necessary for sustainable forest management. Roading and skidding are the most expensive and destructive operations in the forest environment, unless carefully planned and evaluated. The layout and realization of access and main road networks for large concessions should be carried out based on information provided by the forest management plan, annual operating plan. However, planning the secondary road network within a harvesting unit needs to be based on the findings of the pre-harvest inventory (for large concessions).

For small concessions, the layout and realization of access and main road networks is based on a one or a combination of several factors such field work, use of topographic maps, ground trothing, local knowledge etc.

The Guidelines for Forest Operations (for both large and small concessions) provides more details.

#### 4.5.2 *Road planning in practice.*

Road planning should start with establishing a provisional alignment using GIS or existing maps. The provisional alignment is initially established by identifying the main valley and ridge lines which constitutes a sketch showing the essential features of the terrain. The road alignment is then further refined step-by-step by identifying control points and indicating the provisional route. Control points are those areas where it is either desirable to build or wise to avoid building a road. (Refer to Guidelines for Forest Operations (for both large and small concessions) for further description of control points)

#### 4.6. Verification of pre-harvest inventory and final tree marking

Based on the pre-harvest inventory and market considerations, the species to be harvested and their minimum cutting diameters will be determined. With the aid of the tree location map, all inventoried trees should be checked to verify whether they indeed meet the harvesting requirements in terms of species, quality, minimum commercial diameter, and accessibility. Non-inventoried, overlooked trees that meet the harvesting specification can be added to the inventory list and tree location map (large concessions) once the conditions outlined in the Guidelines for Forest Operations (large concessions) are met.

#### 4.7. Layout of skid trail network

Rubber-tired skidders can cause substantial soil disturbance. Repeated travel over the same skid trail can produce deep ruts and a high degree of soil compaction. Skidders should not be used on sensitive soils or closer to streams depending on stream size. Soil disturbance and skid trail density should be reduced by restricting operations to the drier times of the year and by using directional felling. The Guidelines for Forest Operations (for both large and small concessions) provide more details.

##### 4.7.1 *Choice of layout for the skid trail network*

The following two criteria apply to the selection of the optimum skid trail layout and are applied to the different types of terrain as described in the Guidelines for Forest Operations (both large and small concessions):

1. Find the shortest route to extract the logs;
2. Minimize the total length of the skid trail network.

##### 4.7.2 *Other considerations for skid trail alignment*

In addition to the above mentioned criteria for selection of skid trail layout, there are considerations that must be applied to inform the final decision of skid trail placement (Guidelines for Forest Operations (both large and small concessions) for further description).



#### 4.7.3 *Demarcation of skid trail alignments on the ground*

Demarcation of skid trail alignments on the ground must follow the specifications described in the Guidelines for Forest Operations (large concessions).

## 5. CONSTRUCTION OF ROAD NETWORK, DRAINAGE STRUCTURES AND WATERCOURSE CROSSINGS

Roads provide needed access to the forest. At the same time, roads can produce significant amounts of sediment and can be one of the greatest adverse impacts on the local environment, on water quality and on aquatic life. Roads can produce significant erosion, cause gullies, and have an impact on groundwater, wildlife and vegetation.

Road planning is essential to ensure that a road meets the current needs of the user, that it is not overbuilt, and that it minimizes impacts on the environment and to the people along the road. A well-planned, located, designed, and constructed road will be cost-effective in the long term by preventing road failure, eliminating repair needs, and reducing maintenance.

Roads should be planned to minimize the sum of skidding and road construction impacts, which in turn will also lead to cost minimization. The most efficient spacing of roads can be derived by looking at the cost trade-offs between skidding distance and road spacing.

### 5.1 Objectives

- To ensure efficient access to the forest under the best possible conditions;
- To limit the area cleared for the road network to minimize the impact on soil erosion, and forest and harvesting costs;
- To provide efficient and safe transportation of personnel;
- To reduce maintenance costs of haulage equipment;

### 5.2. Road standards

In specifying logging road standards, one must consider cost, the volume of timber to be hauled over the roads, the time of year that the roads will be used, the type of trucks using the roads, the length of road to be built, the available road construction equipment, and the time it will take to construct the roads. In addition, the use and availability of temporary road stabilizing or surfacing options like crushed rock, or laterite should be considered. These are best applied at potential "trouble spots" before a problem occurs.

#### 5.2.1 *Road classification*

Roads are classified as:

1. Main or primary roads
2. Secondary roads
3. Spur roads

Please refer to Guidelines for Forest Operations (for both large and small concessions) for further description for a description of each road classification

The forest road network has features that distinguish it from the public road networks and these are further described in the Guidelines for Forest Operations (for both large and small concessions).

Each road is defined by three elements:

- its profile or cross section;
- its horizontal layout;
- its longitudinal section (projection along the vertical axis).

These are further described in the Guidelines for Forest Operations (for both large and small concessions).

### 5.3 Planning the road alignment

#### 5.3.1 *Procedure for planning the alignment*

There are phases that must be complied with when following the procedure for planning the alignment. These are further described in the Guidelines for Forest Operations (large concessions).

### 5.4 Road construction

Road construction costs are mostly influenced by the standard of road built, particularly road width, type of surfacing, and the steepness of the terrain. A road with cuts and fills on steep cross slopes greatly increases the time of construction, amount of earthwork, the areas of clearing, and adds length to cross-drains and other drainage structures. When constructing roads the following areas must be considered.

1. *Timing of construction*
2. *Roadway development requirements*
3. *Clearing procedure*
4. *Constructing of fills or embankments*
5. *Construction of ditches*
6. *Works on the hillside*
7. *Full-bench, partial bench and balanced roads*
8. *Spreading materials – finishing off*

If a small concession considers new road construction, the user is referred to the Guidelines for Forest Operations (large concession), which provides further details on the standards and guidelines for forest road construction.

### 5.5 Drainage

Drainage problems often cause the largest impacts from roads with regard to erosion, sedimentation, and degradation of water quality. On the other hand, traffic on a roadway with poor drainage will cause ruts, scouring, gullyng and potholes that cannot be repaired until the end of the rainy season.

Furthermore, standing water and seepage under the roadbed may lead to road failure. Thus, poor drainage can incur major operational constraint and added cost. These aspects make road drainage the single most important aspect of road construction and maintenance.

With appropriate structures, water can be rapidly evacuated and roadways only superficially soaked and thus able to dry off within hours and sustain logging traffic. Penetration of water subsequent to maximum compaction should therefore be prevented. Road degradation is usually caused by reduced stability of terrain or roadway from the action of water. The measures to be taken should:

1. prevent penetration of rainwater into the roadway;
2. ensure rainwater running off the road;
3. ensure the different roadway layers are sufficiently drained;
4. prevent water rising by capillary absorption;
5. promote evaporation from the surface.

More details are further described in the Guidelines for Forest Operations (for both large and small concessions).

#### 5.6. Road maintenance

- Regularly inspect ditches, culverts, outlets, and water bars for blockage and restore to working condition.
- Soil, vegetation and other materials that can obstruct water flow, shall be cleared from side ditches
- Road surface maintenance should be performed as needed. Camber and cross section profile should be maintained to allow effective drainage
- Surfacing gravel or loam should not be pushed to the road edge or into drains
- Bridge decking foundations and side walls should be checked regularly
- Any debris that has been pushed into the watercourse shall be removed
- Water should flow freely under bridges
- Silt traps should be cleaned regularly

#### 5.7 Watercourse Crossings

Types of Watercourse Crossings

1. Bridges
2. Culverts
3. Fords/low-level crossings
4. Corduroy with earth fill

##### 5.7.1 *Location of crossings*

Generally, the best rule regarding stream crossings is not to have any, if possible. They can be expensive and a potential source of major environmental and water quality problems.

However, if it is determined that a stream crossing is necessary, choosing the proper location is critical.

These are further described in the Guidelines for Forest Operations (for both large and small concessions).

#### *5.7.2 Temporary stream crossings for the passage of construction machinery*

When road construction involves complicated stream crossings such as bridges, large culverts, and large fills, you may need a temporary crossing to get beyond the streams or drainages to excavate the rest of the road and to build the embankment and bridge approach on the other side. Temporary crossings for the passage of construction machinery can be made by placing hardwood logs on the riverbed in the direction of the water flow.

The Guidelines for Forest Operations (for both large and small concessions) further describes the procedures to be followed.

#### *5.7.3 Earthworks during construction of stream crossings*

- In the construction of roads and bridges creek beds shall not be filled in;
- During bridge construction oil, chemicals, excess concrete, or other waste shall not enter the creek;
- All earthworks shall be carried out to prevent soil from entering the watercourse;
- All spoils should be removed to outside the buffer strip or placed in road fills where possible;
- Watercourse buffer strip vegetation should be retained to the edge of the crossing.

#### *5.7.4 Construction of bridges and Culverts for stream crossings*

Bridges span rivers and creeks with permanent flow. There are many types, depending on the span width and the required service life, but in practice a log bridge is built. The Guidelines for Forest Operations (for both large and small concessions) further details the points to be considered.

### 5.8 Log markets (Landings/Log decks)

Log markets should be constructed to facilitate log sorting and loading activities. Spacing and size of log markets depend on road density, topography, volume to be harvested, projected skid trail pattern, log size, storage time, and loading equipment used. Hence, spacing and size of log markets should be determined during the planning phase. Remember that roads should be planned to minimize the sum of skidding and road construction impacts, which in turn will also lead to cost minimization.

The Guidelines for Forest Operation (for both large and small concessions) further details the points to be considered when constructing Log markets:

- Location of log markets
- Size of log markets

- Log market construction
- Log market operations
- Post-harvest restoration

## 5.9 Borrow Pits

Forest roads are typically built from local materials that must support heavy logging trucks and should have a surface that, when wet or when extremely dry, will provide adequate traction for vehicles. In many cases, the native soil material is too soft, too unstable or impossible to compact (such as white sand). Surfacing both improves structural support and reduces road surface erosion. Laterite, loam and white sand are the most common improved surface materials used.

Use of local material sources, usually borrow pits, can produce major cost savings, compared to the cost of hauling materials from distant sources. Typical borrow pits can have major adverse impacts, including sediment discharge from a large denuded area and impacts on wildlife. Thus borrow pit planning, location and development should be done with care and is further detailed in the Guidelines for forest operations (large concession).

## 6. LOGGING OPERATIONS

Logging operations have various impacts on the forest. Openings (gaps) are formed in the forest canopy causing drastic changes in the microclimate near the forest floor. Adjacent trees break, uproot or are damaged by the trees that are felled. Heavy machinery used during extraction compacts the soil and crushes seedlings and saplings. The impact on regeneration and on trees available for a next harvest may be considerable. Removal or destruction of too many trees, and exposure, compaction and tilling of the soil result in nutrient losses essential to the long-term growth and regeneration of the forest.

Properly planned and executed logging operations, which include pre-harvest forest inventory; application of tree marking rules; marking (and constructing) skid trails before felling; and directional felling, can mitigate most of these impacts. Proper felling techniques (directional felling and proper crosscutting) will reduce splitting and breaking of logs, and hang-ups, thereby increasing volume recovery and improving felling efficiency. Efficiency of skidding is greatly enhanced by pre-constructing skid trails and aligning logs for easy extraction.

### 6.1. Controlled felling

#### 6.1.1 *Objectives*

- to limit damage to the remaining stand, especially to potential crop trees, keystone species, heritage trees and seed trees;
- to minimize timber loss during felling and optimize quantity and quality of timber harvested per tree;
- to facilitate extraction by placing the log into a favourable position;
- to avoid unnecessary, exaggerated gaps; and
- to maximize safety by applying appropriate techniques, devices and equipment.

#### 6.1.2 *General requirements related to felling*

- Respect general felling restrictions
- Respect restrictions related to protected trees

Specific requirements for felling are described in the Guidelines for Forest Operations (for both large and small concessions).

#### 6.1.3 *Felling preparations*

After reaching a tree, the feller has to:

- a. Decide whether to fell the tree or not
- b. Determine the direction of fall
- c. Make escape routes

The final decision to fell and the selection of felling direction are up to the feller who cannot be obliged to fell a tree or to fell it in a direction that he considers dangerous. The feller has to identify potential crop and otherwise protected trees marked by the tree marking crew and decide how to avoid damaging them.

The direction of fall should be determined by balancing the preferred direction of fall with the natural lean of the tree. Additional details are found in the Guidelines for Forest Operations (both large and small concessions).

## 6.2. Topping, cross-cutting and trimming

### 6.2.1 *Topping*

The crown should be separated from the trunk at the felling site. Crown removal or topping is normally done under the first large limb.

In the case of delicate species, the work has to be aligned with the extraction to reduce the risk of insect or fungal attack and thus avoid chemical treatment or splits due to drying.

### 6.2.2 *Butt trimming*

The stem base is trimmed whenever its weight or shape could hamper extraction. Butt trimming takes place at the same time as topping. It is not necessary if the buttresses have been cut flush before felling or when the operator removes them before skidding to facilitate movement and recover an extra section of timber.

Additional details are found in the Guidelines for Forest Operations (both large and small concessions).

## 6.3. Skid trail construction

### 6.3.1 *Opening of skid trails*

Main skid trails should be established before felling, while secondary trails can quite easily be laid out afterwards, provided they have been marked beforehand.

## 6.4. Skidding

In general, coarse, well-drained soils are stronger than fine-textured or moist soils. Operating on soils with low load-bearing capacity will increase the cycle times because the machine may get stuck, its travel speed may be reduced, or its payload may be reduced.

## 6.5. Weather limitations on logging operations

Road construction and maintenance, skidding, loading and hauling are done when conditions during favourable weather condition to prevent extreme damage to soil and water. It is also inefficient and often dangerous. Areas most likely to be workable in wet weather are those with stable soil types and less steepness.



### 6.5.1 *Felling*

Felling should cease when:

- wind force prevents accurate and safe directional felling
- ground conditions are too slippery
- extraction or hauling is not possible due to weather and/or soil conditions
- During short period of inclement weather.

### 6.5.2 *Road construction and skidding*

Skidding and road construction operations should cease under the following conditions:

- When soils are saturated and conditions become very muddy
- When soils become rutted
- sludge or slurry is present on a skid trail

### 6.5.3 *Log market operations*

Construction or operations on log markets should normally cease during heavy down pour, particularly when log markets are located on fine-textured soils, such as loams and clays.

Loading should be halted when:

- water is ponding on the surface of the log market; or
- soils are rutted

### 6.5.4 *Trucking*

Trucking should cease in rainy weather, particularly when trucking on fine-textured soils, such as loams and clays without laterite surfacing and slopes. Trucking should be halted under the following conditions:

- slippery conditions; or
- turbid water, slurry or mud

### 6.5.5 *Resumption of operations*

Soils need to be allowed to drain after heavy rainfall events before forest operations recommence. Additional details are in the Guidelines for Forest Operations (for both large and small concessions).

## 7. POST-HARVEST ACTIVITIES

Rehabilitation of logged areas is required to prevent further deterioration of the logged area and downstream soil and water values, and to encourage forest regeneration. All areas should be left in a clean and tidy condition.

### 7.1 Block closure (applicable to large concessions only)

- Blocks should be closed once logging has been completed.
- Blocks that have been harvested in a specific year without their maximum allowable cut (MAC) having been achieved (usually at the end of the year) may be resubmitted and re-approved for another year for the continuation of harvesting activities (i.e. the block is not closed), under the condition that the harvestable quota for these blocks be limited to the remainder of the volume that was granted in the first instance/approval.
- Roll-over blocks are blocks that had been approved for a specific year but have not been harvested for some reason. These blocks may be re-approved for another year for the commencement of harvesting activities.

See Guideline for Forest Operations for Large for further information.

### 7.2 Roads and skid trails

#### 7.2.1 *Cross-banks or water bars on decommissioned roads and trails*

- To divert water from roads and skid trail surface, water bars should be constructed according to the spacing specified in the Guidelines for Forest Operations for both Large and Small Concessions.

### 7.3 Roads (applicable to FSOs of large concession only)

- Once the annual coupe has been completely harvested, including all felling blocks that form part of the annual coupe, all roads (secondary or spur roads) that provided access should be closed by means of a physical barrier.
- The road surface should be maintained in good condition so the road can be reopened when required. There should be no ruts in the surface and the road surface should be crowned.
- Culverts and bridges should be removed or left in good condition to ensure unobstructed water flow according to the Guidelines for Forest Operations (Large concessions).

### 7.4 Skid Trails

- Temporary skid trails should be removed in accordance with the Guidelines for Forest Operations for both Large and Small Concessions.

## 8. OPERATIONAL HYGIENE

Maintenance, servicing and fuelling of logging equipment involves materials which could cause serious harm to soils and waters if released; pollution of groundwater or watercourses by oil, fuel, lubricants or other hazardous materials will eventually affect all flora, fauna and humans not only near the spill but also downstream. Not maintaining a clean and tidy operation is a sign of poor worker attitude, careless management and disrespect for the environment.

### 8.1 Workshop Facilities

- Locate workshop facilities at least 100 m away from any watercourse or water body
- Workshops, garages, schools and community centres and as far as practicable all other buildings must be approved by the relevant authority prior to its use.
- Electrical wiring and accessories in any building or structure shall be approved by the competent authority.

### 8.2 Field Servicing and Maintenance

- Field and maintenance of equipment should be done in accordance with the Guidelines for Forest Operations (for both large and small concessions).

### 8.3 Fuel, Oil and Hazardous Chemical Handling and Storage

- Hazardous chemicals includes preservatives, pesticides and herbicides
- Field fuel tanks shall be stored, handled and disposed of in accordance with the Environmental Permit and the Guidelines for Forest Operations (for both large and small concessions).

### 8.4 Waste Management

Toxic substances include (spent) hydraulic fluid, coolant, lubricants, fuel gasoline/diesel/kerosene), industrial cleaners, paints and resins, preservatives (including timber treatment chemicals), distillates, insecticides and herbicides, and workshop waste, waste oil and contaminated sludge.

- The use of toxic substances is to be minimized and wherever possible biodegradable substitutes used.
- Waste should be stored, handled and disposed of in accordance with the Guidelines for Forest Operations (for both large and small concessions).

## 9. CAMP HYGIENE

Maintenance of safe, healthy and pleasant living and working conditions for personnel is a prerequisite for a motivated and fit workforce, hence productivity.

### 9.1 Water supply and domestic waste water

- Camps are to be supplied with potable water obtained from running streams, rainwater, or wells.
- Water storage tanks should be properly screened to prevent the breeding of mosquitoes.

### 9.2 Waste and refuse disposal

- Toilet should be built and the sewage should be stored and disposed of in accordance with the Guidelines for Forest Operations (for both large and small concessions).

### 9.3 Water ponding

- Camp areas shall be well-drained so that water does not pond or create mosquito breeding areas.
- The camp shall be checked regularly for any areas where stagnant water can accumulate.

## 10. HEALTH AND SAFETY

Forest operations are hazardous. At every step in the logging process, from felling the tree to transporting it to the mill or yard, workers are subject to a variety of hazards from the environment, type of work, equipment, and physical and emotional strains. Still, many forest workers either are not fully trained or approach their tasks with a risk-taking attitude. While some hazards and risks as well as unsafe worker actions are difficult to control, most can be controlled, reduced, or eliminated. Not every accident or injury will be prevented, but proper safety and loss control management will minimize many risks and injuries. Safety at work is not only an ethical imperative, but it also makes “dollars and sense”, by reducing e.g. sick leave, medical bills and down time

Nearly all logging accidents can be prevented with a strong and consistent commitment to safety by concessionaires, supervisors, and workers; mandatory use of appropriate personal protective equipment; periodic, frequent safety training for all workers; close supervision of new and/or inexperienced workers, zero tolerance for violation of safe working rules; and a healthy dose of common sense.

### 10.1 General rules of health and safety

#### *10.1.1 Responsibility for safety*

1. Every concession holder shall, in carrying out activities under the logging permit, provide, in accordance with the Occupational Safety and Health Act No. 32 of 1997, for the occupational safety and health of workers involved in those activities a safe work environment and enforce safe work practices.
2. Each employee shall be held responsible for performing all work in a safe manner so that injuries to that person and to others will be avoided.
3. Employer, supervisor, employee, or designated person shall instruct new employees in safe practices.
4. An employee shall notify his employer or supervisor before attempting any work, which, in the employee's opinion, appears hazardous beyond normal operating conditions.
5. An employee shall report all injuries to his employer or supervisor without delay, regardless of the nature of the injury.
6. Good housekeeping of all work areas and equipment shall be practiced.

### *10.1.2 Legal requirements pertaining to health and safety*

1. For Large Concessions only, where not less than fifty persons are employed, the concession holder shall employ thereon a sick nurse and dispenser registered under the provision of the Medical Service Act unless there is a Government hospital or dispensary within 10 miles of such concession area.
2. Access to basic medical facilities should be guaranteed to workers and families where they are accommodated on-site;
3. The employer shall keep, maintain and make available to workers in the workplace, in a location that is readily accessible, a medicine chest with contents as prescribed, and shall ensure that first aid, including trained personnel, is available at the workplace;
4. A joint workplace safety and health committee is required or at least one safety and health representative from among the workers at the workplace who does not exercise managerial functions;
5. The joint safety and health committee will carry out the functions as specified in the Guidelines for Forest Operations (for both large and small concessions).
6. The employer and committee or safety and health representative shall prepare and review, a written occupational safety and health policy;
7. The employer shall ensure the provision of suitable and adequate protective devices, materials and equipment as prescribed in the policy;
8. The employer shall provide and maintain a safe, sound and healthy and secure working environment as far as reasonably practicable;
9. The employer shall further meet the requirements on health and safety as specified in the Guidelines for Forest Operations (for both large and small concessions).
10. Supervisors shall ensure that a worker works in a safe manner as specified in the Guidelines for Forest Operations (for both large and small concessions).
11. A register of all workplace accidents and injuries shall be kept by the employer and appropriate investigations conducted;
11. Where any accident arising out of and in the course of the employment of any worker occurs and causes loss of life to such worker; or disables such worker, for more than one day, notice of the accident shall be sent by the employer to the relevant Health Officials or organizations as specified in the Guidelines for Forest Operations (for both large and small concessions).

### *10.1.3 Personal conditions*

All employees must adhere to the personal conditions specified in the Guidelines for Forest Operations (for both large and small concessions).

#### *10.1.4 Employment of minors*

Logging operations are rated as hazardous occupations. Employers shall not knowingly employ persons under the age of 14 in keeping with the International Labour Organization Convention in any logging operation, or in any business trade or process ancillary to the logging operation. No one under 18 years of age should be employed or allowed to work on or near any phase of the actual logging operation.

#### *10.1.5 Weather conditions*

Work shall be terminated and employees moved to a place of safety when environmental conditions may endanger employees in the performance of their jobs. The Guidelines for Forest Operations (for both large and small concessions) specifies these environmental conditions.

#### *10.1.6 Training*

1. Every worker in a forestry operation must receive the training necessary to safely perform the worker's duties.
2. The employer shall provide training to employees in keeping with the training requirements specified in the Guidelines for Forest Operations (for both large and small concessions).

#### *10.1.7 Safety meetings*

1. The employer shall hold safety meetings for each employee, individually or in groups.
2. The employer should maintain a safety meeting record under subsection (1) to document the employees present, safety topics discussed, and date of the meeting.
3. Before a crew of workers starts work in a new work location, a crew safety meeting shall be held to inform the workers of any known or reasonably foreseeable risks in that location and the actions to be taken to eliminate or minimize those risks.
4. Employers shall meet any other safety meeting requirements as prescribed in the Guidelines for Forest Operations (for both large and small concessions).

### 10.2 Emergency rescue

- Provision should be made for the quick evacuation of a person in the event of an injury or illness, which requires medical assistance.
- Transport or a means of communication should be available at the worksite to contact rescue services in case of an emergency.
- At permanent worksites, a place should be provided where an ill or injured person might rest in comfort until the evacuation is under way.

### 10.3 Personal Protective Equipment

The use of proper personal protective equipment is essential for reducing logger injuries. Often hazardous elements cannot be removed or corrected, therefore, it is vital to protect the worker. Proper personal protective equipment is as important a part of any logging operation as a chainsaw, skidder, and loader. Properly protected and trained workers have better work habits, better attitudes, and produce more wood at lower costs. Proper personal protective equipment properly used can greatly reduce the number of logger injuries.

#### *10.3.1 Personal protective equipment*

1. Personal protective equipment and first aid kits shall be provided by the employer.
2. Employer shall provide personal protective equipment based on the job activity as specified in the Guidelines for Forest Operations (for both large and small concessions).
3. All persons present on the logging operation including log truck drivers and anyone on or near the woods or landing areas shall wear personal protective equipment in keeping with the requirements prescribed in the Guidelines for Forest Operations (for both large and small concessions).
4. The employer shall assure that personal protective equipment is maintained in a serviceable condition.
5. The employer shall assure that personal protective equipment which are defected or damaged shall be repaired or the unserviceable personal protective equipment shall be replaced before work is commenced.

#### *10.3.2 General clothing*

Woods workers shall wear properly fitted clothes, which are appropriate for the job, based on the requirements specified in the Guidelines for Forest Operations (for both large and small concessions).

### 10.4 Fire prevention and suppression

#### *10.4.1 Fire suppression equipment*

- Employers shall ensure the placement of fire suppression equipment (including spare suppression equipment) at critical areas and adhere to the use of the approved types of fire suppression equipment, which are specified in the Guidelines for Forest Operations (for both large and small concessions).
- Fire suppression equipment shall have the proper rating, capacity, and charge to suppress any fire effectively.
- Each suppression unit must be checked for proper charge and operation. Recharge all fire suppression units immediately after use.



#### *10.4.2 Fuel storage*

Bulk fuel must be stored and transported based on the requirements prescribed in the Guidelines for Forest Operations (for both large and small concessions).

The use of portable fuel containers must be in accordance with the requirements for such use as prescribed in the Guidelines for Forest Operations (for both large and small concessions).

#### *10.4.3 Logging equipment fire prevention*

Professional loggers know the value of their logging equipment. Most fire hazards are created by:

- Accumulation of debris inside machine compartments.
- Excessive build-up of oil, grease, and fuel from leaks and spills.
- Faulty or damaged electrical system wiring and components.
- Overheating of brakes when improperly applied or accidentally left engaged.
- Heavy build-up of flammable materials around rotating drive shafts which can ignite due to friction.

The employers shall assure that the routine fire prevention maintenance guidelines as specified in the Guidelines for Forest Operations (for both large and small concessions) are carried out.

#### *10.4.4 Vandalism protection*

Employers should follow the guidelines specified in the Guidelines for Forest Operations (for both large and small concessions) to assist in reducing vandalism.

### 10.5 Equipment safety devices

#### *10.5.1 Chainsaws*

All chainsaws shall be maintained in good working order and all safety devices shall be operational at all times. Specifically all chainsaws should be equipped based on the specifications outlined in the Guidelines for Forest Operations (for both large and small concessions).

#### *10.5.2 Heavy equipment (crawler tractors, skidders, front-end loader), skidders, Trucks, trailers and semitrailers and boat equipment*

All heavy equipment (crawler tractors, skidders, front-end loader), skidders, Trucks, trailers and semitrailers and boat equipment must be equipped for safety based on the specifications outlined in the Guidelines for Forest Operations (for both large and small concessions).

### *10.5.3 Safety with maintenance of skidders and other logging equipment*

When maintenance is required on a skidder or other piece of equipment during service or maintenance, accidents can be avoided by following the step-by-step lockout-tagout plan as prescribed in the Guidelines for Forest Operations (for both large and small concessions).

## 10.6 Chainsaw operations safety

### *10.6.1 General chainsaw safety*

Chainsaws are an integral part of many logging operations. Chainsaw related injuries are still reported frequently. Most chainsaw injuries are the results of saw "kickback". Proper training, techniques, equipment, and personal protective equipment can reduce the potential of kickback and chainsaw related injuries.

1. Proper personal protective equipment shall be used by all saw operators.
2. Chainsaw operators should adhere to the general chainsaw safety guidelines specified in the Guidelines for Forest Operations (for both large and small concessions).

### *10.6.2 Felling*

Felling timber is recognized as the most hazardous job in logging. Safety in felling must be the most important goal of the job. More workers are severely injured, maimed, or killed while felling timber than in any other phase of the logging operation. Proper training, planning, felling techniques, safety, and common sense will not only ensure safe operation, but will increase the quality of the cut log.

1. Proper personal protective equipment must be used when felling timber.
3. When felling timber, workers must adhere to the guidelines for tree felling as specified in the Guidelines for Forest Operations (for both large and small concessions).

### *10.6.3 Bucking*

The most common injuries received while bucking are saw cuts to the feet and legs. Many injuries are also caused by logs rolling onto workers' legs and feet. Bucking should be done in as clear an area as possible to avoid saw tip contact with other logs, which may result in kickback.

1. Proper personal protective equipment must be worn when bucking.
2. Chainsaw operators should adhere to the guidelines for bucking as specified in the Guidelines for Forest Operations (for both large and small concessions).

## 10.7 Skidding Safety

Before commencing the skidding operation, the skidder operator should adhere to the skidding safety guidelines as specified in the Guidelines for Forest Operations (for both large and small concessions).

The operator should ensure the safe operation of rubber-tired skidders by adhering to the safety guidelines as specified in the Guidelines for Forest Operations (for both large and small concessions).

## 10.8 Landing and Log market areas

Many accidents are reported each year in which workers are injured while on and around the landing and log market areas. Many injuries can be prevented when proper safety guidelines coupled with proper training are used. Injuries received while working on the landing have resulted from improper chainsaw use, working too closely to loading or skidder operations, improper or lack of use of proper personal protective equipment, trashy landing areas, and poor ground conditions.

Severe and sometimes fatal injuries have resulted when workers are struck by log loaders, approaching skidders, or rolling logs. Proper landing or log market layout and proper planning and coordination of equipment and worker movements can greatly enhance the safety of the landing and log market area.

1. Landing and log market areas should be constructed, equipped, used and maintained based on the specifications for the landing and log market areas as outlined in Guidelines for Forest Operations (for both large and small concessions).

## 10.9 Loading

Log storage on the log market (landing) area, loading with a rubber-tired loader, loading logging trucks, binding the load, mounting and dismounting trucks, pre-trip inspection of logging trucks, inspections when entering a public road, operation and movement of logging trucks and unloading should all be done in accordance with the requirements outlined in the Guidelines for Forest Operations (for both large and small concessions).

## 10.10 Transporting workers

A driver of a vehicle transporting workers in a forestry operation on a road must comply with the requirements outlined in the Guidelines for Forest Operations (for both large and small concessions).

## 10.11 Water Operations

Boats used in or about a forestry operations should be maintained and operated in accordance with the requirements for water operations as specified in the Guidelines for Forest Operations (for both large and small concessions).

## 11. SOCIAL ISSUES

Sustainable forest management is ultimately about people. Healthy social practices in managing forests promises to foster sound business as well as to improve Guyana's economy. The forests need to be socially beneficial to contribute to the objective of sustainable development. The benefits derived from the existence and management of the forests, and accruing to people living in and around them may be a precondition for the conservation of the forest.

The practices and standards set out in this chapter are based on the land and forest use rights and responsibilities; and community and work place relations, rights and responsibilities.

The rights of Indigenous people of Guyana are entrenched in the Guyana constitution and the Amerindian Act of Guyana. The Amerindian Act guarantees land rights and sets out a legal process not only for titling of existing villages, but also claims for new lands and extensions to existing lands.

### 11.1 Land and forest use rights and responsibilities

#### Respect for legal or customary rights to land

- The concessionaire shall be in possession of a legally valid concession agreement for the area from which all timber is sourced
- If the concessionaire has contracted a third party (includes concession activities relating to harvesting, extracting of forest produce and transporting to another point out of the concession, processing and export, of forest produce), such arrangement shall be formally approved by the GFC using the defined approach and in compliance with the Forests Act.
- There shall be no legal titles by indigenous or other persons in the area from which all timber is sourced unknown to GFC and the concessionaire.
- The GFC should be informed of any illegal forestry activity.

Any contractual arrangements for logging on Amerindian lands must be made in accordance with the Guidelines for Forest Operations (for both large and small concessions).

Conflict management between forest operations and local communities should be based on the Guidelines for Forest Operations (for both large and small concessions).

### 11.2 Community and work place relations, rights and responsibilities

#### Respect for cultural and traditional values

- Legal and traditional, non-commercial uses and customs of the forest shall not be prevented by the concessionaire.

### Building mutually beneficial partnerships

- Forest Sector Operators should build mutually beneficial partnerships with local communities in accordance with the Guidelines for Forest Operations (for both large and small concessions).

### Terms and conditions of employment

- Employers shall inform employees of the terms and conditions of service prior to or at the time they are hired.
- Employers shall comply with the requirements specified in the section on *Terms and conditions of employment* in the Guidelines for Forest Operations (for both large and small concessions).

### Contractors and contracted labour

- Employers/concessionaires should develop a contract agreement between the concessionaire/employer and the contractor to include the list of information for contract agreements as specified in the Guidelines for Forest Operations (for both large and small concessions).

Employers must comply with the requirements for Equal opportunity employment, prohibition against forced labour, employment opportunities for local and forest-dependent populations, education and training for workforce and local populations, social security benefits, recreation, prohibition against child labour, workers right to union representation and conflict management in the workplace, as specified in the Guidelines for Forest Operations (for both large and small concessions).