FORESTRY TRAINING CENTRE INCORPORATED

AN INTRODUCTORY COURSE ON FOREST MANAGEMENT FOR COMMUNITIES

February, 2009

TROPICAL FOREST FOUNDATION

FOREWORD

As we strive to manage forests well, the questions come hard and fast: What to do? Why do it? Who should do it? Who will and who should benefit? When to do it? How to do it? What are our options? Is it sustainable or feasible? Does it meet national standards? What skills sets are required? These are useful questions because they make us THINK.

Forest resources are renewable and therefore occur over many years in the same location. All of us benefit from forests in various ways. More importantly we can all continue to enjoy most of those benefits indefinitely if we simply take time to plan our use of the forest resources and we choose the proper technologies to harvest the products we need and avoid the total removal of forests as far as practicable. The operatives engaged in forestry activities at all levels must help take **responsibility** for the quality of forest practices implemented by a forest enterprise or a community.

This manual is intended to address the basic training needs of the ordinary forest operatives who must make or act on decisions in the field on a regular basis and who also needs to understand the basis for any plan or guideline that he or she may be asked to follow. It is also desirable that ordinary operatives are able to influence decision making processes at any level, and this opportunity is best exercised if the operative understands some basic facts about forest management and timber harvesting based on reduced impact logging principles. Trained operatives are usually in a position to take full advantage of emerging employment opportunities and available technical assistance.

Forest management objectives, goals and prescriptions are more useful when documented, because forestry activity occurs over very long periods. It is important that different people (stakeholders) be able to work with the same **plan** over time and that they understand the basis on which decisions were made; the reasons for any changes should be understood by all and those changes should be documented. Forest enterprises and communities in particular require such plans for their own purposes and they must take care to prepare one, whatever the objective of management. Forest enterprises and communities are encouraged to maintain an adequate system of records to track trends in costs and production.

This manual on 'An Introductory Course on Forest Management' has been developed by FTCI from manuals prepared by FTCI for various clients. It has been revised overtime primarily on the basis of feedback from students and to some extent, feedback from donors who have asked for such training.

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ACKNOWLEDGEMENTS

FTCI acknowledges the support of ITTO in sponsoring the production of this manual via ITTO Project PD 333/05. Although many other manuals exist locally, none is as comprehensive as this one.

Several agencies have shown an interest in an introductory course in forest management for communities in particular. These include the GFC, UNDP, LEAP, WWF (Guyana) and the FPA. The interest of those agencies has in large measure established the scope and nature of the contents of this manual.

FTCI is grateful to the several communities- for example Rockstone and Santa Aratack that have been exposed to training in forest management and whose interest and questions have also helped to determine critical subject areas for this manual.

Finally, the staffs of FTCI, who have been teaching other primitive versions of the manual, have identified areas that require review or further development. FTCI is grateful to such staffs.

ACRONYMS

AAC	Annual allowable cut
DBH	Diameter at breast height
FPA	Forest Products Association
FTCI	Forestry Training Centre Incorporated
GFC	Guyana Forestry Commission
GLASC	Guyana Lands & Surveys Commission
ITTO	International Tropical Timber Organization
LEAP	Linden Economic Advancement Programme
NIS	National Insurance Scheme
RIL	Reduced Impact Logging
WWF (Guyana)	World Wildlife Fund-Guyana

THE USE OF THIS MANUAL

Two major challenges impact on the development of an introductory manual on forest management: firstly, the subject is a big one and the selection of the content must be done with care; and secondly, the identification of the target group that will use the manual. The first challenge is managed through consultations. The second challenge is more difficult.

Community based training sessions attract participants with diverse academic backgrounds and experiences. Users of this manual are encouraged to be a practical as possible by relating as far as possible to activities within the communities targeted for training, selecting issues that participants van relate with readily.

Many of the subject areas covered can be broken up into very short 90 minute sessions with the aid of flip charts or power-point presentations.

A number of useful aids will help tremendously in the presentation of the subject. For example, a variety of thematic maps at scale 1:25,000 or 1:50,000, posters and brochures will be extremely useful.

1. USEFUL CONCEPTS AND DEFINITIONS

Several terms and concepts set the context for our discussions on forest resources management.

Forestry

Forestry may be fined as the practice of studying, establishing, and conserving forest resources, and managing them to achieve specific human benefits. Forestry is a science because forest resources exist on scientific principles: tree growth, flower pollination and seed dispersal for example are based on certain biological and ecological principles. Forestry is also an art because one has to make decisions on investments or inputs and take certain risks in order to create the desired economic or social benefits.

Forestry Authority

The agency assigned to manage public forests (or State forests or the forest estate) is the forestry authority. Authorities go by different names in different countries. In Guyana, the forestry authority is designated the Guyana Forestry Commission; prior to 1979, the local forestry authority used to be called the Forestry Department. In some countries such as Guyana, the forestry authority deals only with some segments of the forest resources such as forest enterprise for timber production, while other segments such as tourism, watershed management, and wildlife for example are managed by other authorities such as the Environmental Protection Agency or the National Parks Commission. In Trinidad & Tobago & Dominica on the other hand the forestry authority, the Ministry of Agriculture, manages the forest resources and all related forest resource based goods and services.

Forest and Forest Resources

Forest refers to a parcel of vegetation dominated by trees. A tree within a forest environment usually carries a single straight bole greater than 5m and with all branches at the top of the trees. Forests frequently contain lianas. (Note that a savannah is dominated by other plants such as grasses or shrubs).

Forest resources refer to *everything* that we encounter within a forest, including plants, rocks, nests, eggs, feathers, takubas, creeks, flowers, fruit and orchids. When we talk about benefits from forest resources, we include timber and any other product we can take, including fresh water. *Ecotourism* benefits considerably from non-timber resources in the forest.

Forest Management

Forest management is the application of business principles and forest technology to a forest resource to achieve specific objectives. Forest management requires consideration of a number of social, technological and ecological considerations. It includes the examination of the resources available, decisions on what to do with the resources, the review of the various economic options/technologies that could be employed to manage (the harvesting or conservation) of those resources. Forests are frequently managed for timber, wildlife conservation, conservation of biodiversity, conservation of water resources, and conservation

of soils. (In Guyana, mangrove forests are deliberately left in place to protect many coastal areas.

Forest conservation

Forest conservation allows for controlled or regulated use: one may extract products, subject to certain conditions. Ways of conserving forests include diameter limits on felling trees, restricting the harvest of some species, restricting the volume of timber that could be harvested per unit area, restrictions on hunting, fishing and seed collection, penalties for the careless use of fires within forests, protection of forests on the margin of rivers and creeks, and restrictions on use of potential pollutants (such as oil) and garbage within forest resources.

Forest preservation

Forest preservation refers to the act of maintaining a parcel of forest in its natural state; no active interventions may be allowed - no hunting, no fishing and no harvesting of any physical product, no matter how insignificant it may appear.

Forest ownership

Forest ownership may take various forms.

> ***State forests*** are forests owned and managed by the State via a forestry authority; in the case of Guyana the name of the forestry authority is the Guyana Forestry Commission. Subject to prevailing policies at the national level, the Guyana Forestry Commission decides who should harvest forests, where and when and how much volume of timber may be removed and under what conditions. State forests are normally allocated to private persons, cooperatives or corporate entities via various forms of *forest concession agreements or permits*.
>
> ***Communal forests*** are owned by communities; for example the forests within the Hururu Amerindian District are owned by the people that comprise the Hururu community.
>
> ***Institutional forests*** are owned by institutions; an example is the forests held by Iwokrama via the Iwokrama Act.
>
> ***Private forests*** are owned by individuals, cooperatives or corporate entities; many eco-resorts may fall into this category.

Multiple uses of forests

Multiple uses refer to the management of the forest resources for different objectives either simultaneously or in a sequential manner (for example, one may harvest timber, then other persons may collect non-timber forest products afterwards).

> ***Exclusive use*** refers to the use for which a forest is managed, no other use is permitted; for example Iwokrama has identified its forests into zones- where only

specific activities may occur in each zone. An ecological reserve where strict forest preservation is enforced is also an example of forests managed under a regime of *exclusive* use.

Primary use refers to the use for which a forest is primarily managed, with allowances for other managed ***secondary uses***; for example it is possible to manage a forest for timber production while allowing the harvesting of non-timber forests or the bleeding of balata; note that both the harvesting of timber (the primary use of the forests) and non-timber products (the secondary use of the resource) are *managed*.

Incidental uses refer to uses which are allowed but not managed; for example it is quite common for hunters and gatherers of Crabwood seed, Sawari nuts, or Awara, to enter forests that are *managed for timber production*. However the activities of the gatherers are *not managed.*

2. THE LEGAL FRAMEWORK FOR FORESTRY

2.1 The Guyana Forestry Commission (GFC)

The current ***legal basis*** for the GFC is the GFC Act of 2007. The GFC comprise between nine to thirteen members *appointed by the Minister* on the basis of relevant knowledge and experience in various areas *including* but not limited to forest management, forest industries, environmental management, and land use planning. The Commissioner of Forests is an ex-officio member of the GFC. The structure of the GFC is set out in Figure 1.

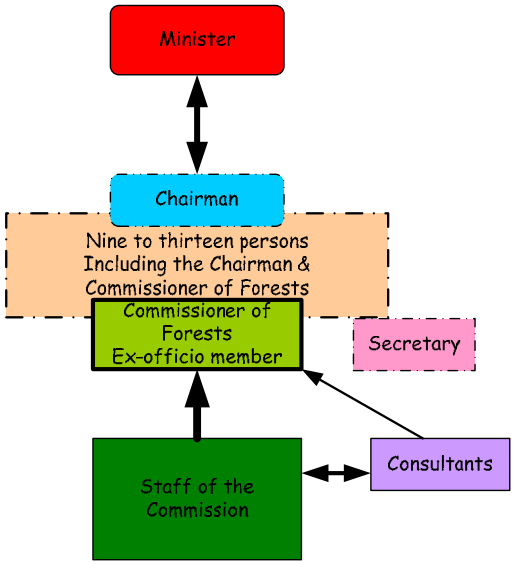

Figure 1: Illustration of structure of the Guyana Forestry Commission

The ***objective*** of the GFC is to encourage the development and growth of forestry in Guyana on a sustainable basis. The ***functions*** of the GFC include:

1) Developing, advising the Minister on, and carrying out the forestry policy;
2) Preparing plans, codes of practice and guidelines for the conservation and management of forests;
3) Researching, collating, analysing, preparing and disseminating data, statistics, and other information about forests and all aspects of forestry including forest ecology and the use of forest produce;
4) Carrying out forest inventories;
5) Providing or facilitating education and training in forestry and forestry –related jobs;
6) Providing forestry extension services and give advice to persons and communities interested or involved in forestry; and providing an inspection, certification, and accreditation service for quality control of forest produce.

2.2 State forests, forest concession agreements, other agreements and permits

The land area of Guyana, State lands, is administered by the Guyana Lands & Surveys Commission (GLASC). GLASC allocates land for specific purposes in accordance with the developmental objectives of the Government. The area of State lands assigned for the development of forestry practices-the forestry sector- is designated State forests.

The Guyana Forestry Commission, the forestry authority, has direct responsibility for the management of State forests. In accordance with national goals and forestry legislation respectively, the GFC allocates parcels of State forests to individuals, enterprises, communities and organizations via ***forest concession agreements*** or other agreements approved by the Government. In contemplating the award of any parcel of forest, the GFC may impose such conditions as it sees fit including the submission of environmental and social impact assessments and business plans. The GFC routinely consults with public agencies and other stakeholders in contemplating and deciding on the award of any agreement, permit or authorisation.

In granting a ***forest concession agreement,*** the GFC prescribes:

a) Who may enter and occupy a specified area of State forests
b) The manner of cutting and taking specified kinds and quantities of forest produce in the area
c) The manner of carrying out specified forest operations or carrying out forest conservation operations in the concession area
d) The manner of carrying out specified operations in any other area of State forests as necessary to facilitate the activities or operations specified in paragraphs (a, (b or (c;
e) The period in which any activity or operation may occur;
f) The conditions under which an agreement may be amended or renewed.

Other 'concession types' issued by the GFC include:

Exploratory Permits- permits the holder to carry out exploratory operations within a specified area of State forests with a view to applying for a concession in respect of that area or any part of it; in addition it allows the permittee to cut or take specified kinds and quantities of forest produce *primarily* for testing and research.

Use Permits – allow the holder(s) to conduct: scientific research; education and training; recreation or ecotourism- including hiking and camping; ad taking photographs or making films or videos or sound recordings.

Community forest management agreement-allows communities to acquire and secure rights to manage and benefit from their local forests on a sustainable basis in order to help meet local needs, stimulate income generation and economic development, and enhance economic stability.

Afforestation agreement–allows the holder to plant specified trees and specified plants in a specified area of State forest and to manage the planted area in accordance with a forest management plan approved by the GFC.

State forest authorisation–generally grants temporary, non-exclusive access to State forests for a specific purposes agreed with the GFC.

3. THE BASIS FOR FOREST MANAGEMENT

3.1 The nature of forests

3.1.1Forests and other masses of vegetation

There are different sets of vegetation (see Figure 2). Savannahs for example refer to areas dominated by grasses and/or scrub. Fields of mature cane or rice are of course dominated with grasses, while an orchard of coconuts or oil palm may also lay claim to being a forest through they are dominated with palms. For our purposes, we are dealing with forests-areas dominated by trees and lianas and which could be divided into various vertical layers depending on the respective vertical positions of mature and juvenile trees, lianas, orchids and other plant forms. Tropical forest resources are very complex eco-systems (see Figure 3) and we need to take a closer look at the nature of these resources before managing them.

Figure 2: Photos of savannah (left) and forest (right)

Figure 3: Profile of tropical forests showing the various plant forms present: at left, Cayenne (Richards, 1998), at right Brunei (Whitmore, 1990).

3.1.2 Forest types

Soil conditions frequently vary from one area to a next with terrain. Near water courses for example, the soil tends to be water logged, while on hill tops with sandy soils the soil tends to

be well drained. On gently rolling terrain between the hills and the watercourses, conditions are more intermediate, neither too wet nor too dry. Each tree species appear to grow well on specific soil conditions. Therefore we have what are called forest types, groups of trees occupying only certain soil types. According to Vieira (1980), common forest types in the lowland area of Guyana are:

- Wallaba forests-characteristic of white sand soils; the dominant species is Wallaba *(Eperua spp.).*

- Mixed forests-these occur on deep, well drained brown sands, loams or lateritic clay soils on hilly or undulating terrain. These forests are heterogeneous in composition and provide most of the commercial timber. Common species are Greenheart (*Chlorocardium rodiei*) and Kabukalli (*Goupia glabra*) (see figure 3).

- Marsh and Swamp forests-these occur on flat, low lying terrain. The soils vary from alluvial silts or clays to pegasse. The length of the period of inundation, and the drainage conditions strongly affect the composition of these forests (see figure 4). Common species are Crabwood (*Carapa guianensis*) and Manni (*Symphonia globulifera*)

- Evergreen Seasonal forests-this type occurs mostly on well drained brown sands, east of the Demerara River. It may be similar to mixed forests in composition. (Common species are Kauta (*Licania spp*) and Suya (*Pouteria speciosa*)

3.1.3 Other resources in forests

Forest resources are not just about timber however. Forests (and tropical forests in particular) host a large assortment of fauna and non-timber products (see Figures 4 and 5).

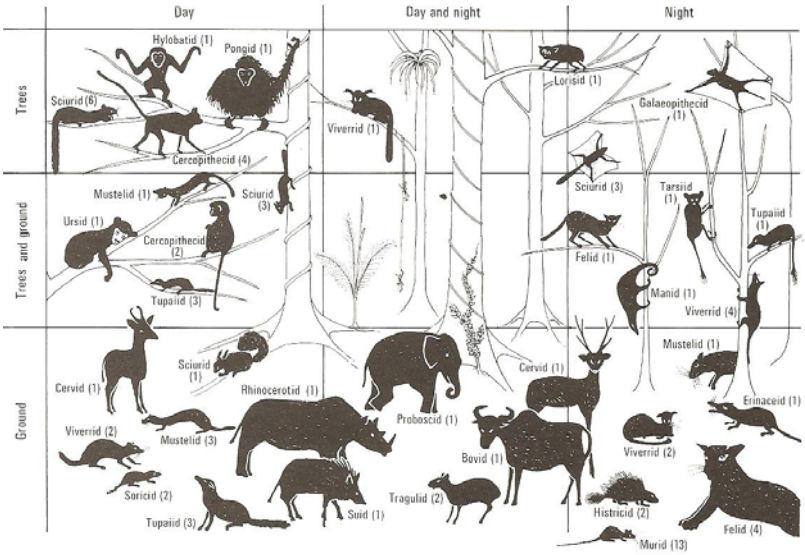

Figure 4: Diagram showing how animals occupy forests
(Source: Whitmore, 1990)

Animals contribute immensely to the pollination of flowers (see Figure 6a), seed dispersal (6b), and to sustaining soil fertility through nutrient cycling. Animal – animal predation and animal-plant predation also helps to keep the spread of diseases under control.

Figure 5: Livelihood opportunity: young men harvesting heart-of-palm

3.1.4 Forest products and services

From the economic perspectives, forests do not simply exist. They perform a variety of functions, such as in the recycling of water vapour, the recycling of carbon and oxygen respectively, and in soil formation processes. Forests help ameliorate or stabilise climate and help create large masses of fresh water that support thousands of riverine/marine organisms. Figure 6 shows nutrient cycling and flower pollination processes respectively. Incidentally, the benefits of many intangible services have a significant impact on our agricultural potential. Soil formation processes, fresh water storage, and populations of insects capable of pollinating agricultural crops or serving as predators of common pests affecting agricultural crops are useful benefits At this point in time, in the face of global warming and related consequences, many economists and scientists are trying to put costs on some of the intangible functions that forests perform. Therefore by conserving forests, it is possible to reap considerable value from emerging developments.

The products or direct benefits of forests are more apparent and include:

a) Timber and leaves for housing construction, firewood
b) Fruits, honey, heart of palm, edible seeds and nuts
c) Meat, fish, and eggs
d) Flowers, orchids and decorative plants, lianas
e) Medicinal plants, pesticides and other pharmaceutical products, bark
f) Latex, oils, waxes, dyes, and resins
g) Aesthetic values (from mountainous terrain, waterfalls, rivers and rock outcrops)
h) Feathers and seeds for personal decoration 'jewellery'
i) Aquarium fishes, birds and pets
j) Spiritual benefits
k) Opportunities for reflection and research
l) Livelihood opportunities (hunting/gathering, ecotourism, etc.).

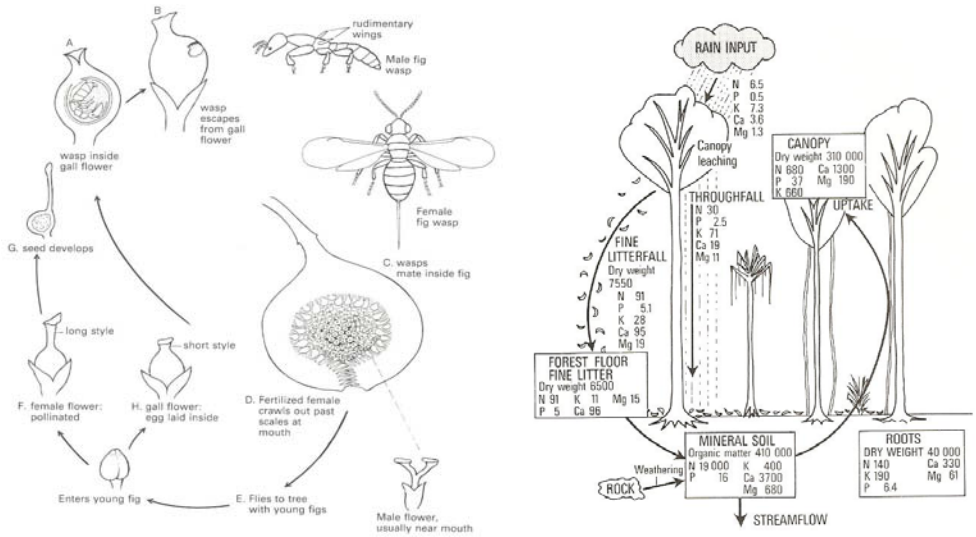

Figure 6a: Diagrams showing services provided by forests:
at left, flower pollination; at right, nutrient cycling (Whitmore, 1990)

Figure 6b: Fruit of *Parahancornia amapa (Huber) Duke, Apocynaceae,*
eaten by monkeys in the canopy and herbivores on the forest floor

3.1.5 Forest Dynamics

Under normal forest conditions, trees die from old age, injury, from strong winds or felling damage, disease, and predation. These trees are replaced by younger trees in the understory and the forest remains intact, more or less. This constant change in the structure of forests (in age class, species composition, the relative proportion of young and old trees and the resulting changes in mean tree height and mean diameter) is referred to as forest dynamics. In contrast, interventions by loggers, such as in road and skid trail construction, log market and borrow pit construction, and the felling of trees above a certain diameter at breast height represent rapid interventions in the forest, to the extent that the forest may not

always be able to carry out the services described above, considerably reducing its commercial and ecological values and reducing the benefits previously provided.

One of the concerns over forest conservation is to make sure that forests continue to provide the range of goods and services indefinitely. Where there is deforestation, all the benefits are lost (permanently) and it would take centuries and huge costs to recreate forests to the extent that it begins to provide the full range of useful benefits again as the original forest.

3.2 Objectives of management

In the face of all the potential benefits of forests, forests may be managed primarily for two purposes: production or protection. Management for production focuses on timber and non-timber products; fruits/seeds; latex resins and dyes; edible parts of plants (see Figure 5). Management for protection allows for forest based services and aesthetic values and includes activities related to wildlife management, watershed management, conservation of biodiversity, eco-tourism and scientific research. It is possible to manage forests for more than one objective however, providing these are all compatible. Therefore the first step in forest management is to set objectives for forest use.

4. PLANNING

4.1 The need for planning

Forests represent a system comprising diverse species, fauna that should be conserved and varying soil and terrain conditions. In natural forests, therefore, there is usually very little uniformity in field conditions. Forestry authorities cannot afford to gamble and therefore they frequently publish legislation and guidelines to regulate the use of forests.

The question for forest enterprises then is 'How can enterprise make money in the face of such a complex resource, and prescriptions guiding all interventions? The enterprise must put all considerations (or variables) on the table, and after evaluating them, try to make the best decision possible, based on its own objectives of management. Enterprises must therefore plan.

4.2 The benefits of planning

We plan in order to:

- Ensure consideration of all variables (species of timber and their peculiarities, diameter classes of commercial timber, forest technology, skills sets, etc.) that could affect the enterprise.
- Organize the provision of inputs required for timber harvesting
- Use forest resources more efficiently (and manage multiple uses of the forest resources).
- Optimise the use of logging equipment and reduce logging costs
- Plan timber harvests
- Manage timber quality
- Control all interventions to the forest resources, ensuring compliance with national prescriptions or guidelines
- Consider long-term events.
- Plan the development of skills sets
- Ensure the integration of legal obligations

4.3 Levels of Planning

4.3.1 Strategic Planning

For strategic planning, the enterprise or community must consider, in the face of the general prevailing socio-economic conditions nationally and regionally:

a) What are its own goals; in the case of a community, the focus may be community development rather than a focus mainly on profits.

b) What does it want to do with its forest; should it focus on a few primary products or a wide range of products;

c) What level of technology it will employ: communities may wish to focus on labour based technologies rather than sophisticated machines that require considerable inputs (in terms of lube oil, diesel, oil filters, etc.

d) Will the proportion of young people within the community increase substantially?

4.3.2 Operational 3-5 yr (Forest Management) Planning (See Annex 1)

3-5 year periods represent a useful period for the realisation of most short term management goals. 3-5 years represent a convenient time to plan and implement major infrastructure such as roads, train staff, conduct pre-harvest inventories, purchase logging equipment and plan marketing strategies.

4.3.3 Annual Operations Plan (see Annex II)

An annual operations plan is a subset of the 3-5 year operational plan. An annual plan in essence reports on events over the past year, and sets out the extent and scope of activities for the next twelve months (see outline in Annex III). Maps are exceedingly important in describing key operational events, including the location of road works, logged over areas, areas inventoried and to be inventoried, the location of forward camps, etc.

4.4 Basic Planning and other requirements for timber production.
4. 4.1 Basic steps for forest management

The first steps to undertake in the management of a forest area are to:

a) Establish the extent and borders of the concession area and post suitable notices; and
b) Establish the nature and extent of its various resources.

4.4.2 The extent and borders of the concession

You can only manage something that you have ***control*** over (and that is why most of us place a mark on things that we own or put a fence on the perimeter of our properties).

In forestry, it is critical that work in this regard starts off with the proper topographic maps at a scale of 1:50,000 or 1:100,000 depending on the size of the area; such maps are available from the Guyana Forestry Commission (GFC) and the Guyana Lands and Surveys Commission (GLASC) for a small fee.

The next step is to get a proper description of the area to be placed under management. In the case of a forest concession, the description may be obtained from the Guyana Forestry Commission while for Amerindian communities; the description may be obtained from the Ministry of Amerindian Affairs or GLASC. Once there is no major problem with the description, the next steps are to demarcate the boundaries and place sign boards at strategic points. In many cases, rivers and creeks are used as natural boundaries. In many instances though, cut lines are required and in such cases basic surveying skills are required.

Sign boards should contain the name of the enterprise or community and the Forest Licence number. The idea here is that you want anyone who ventures near to the concession to be aware immediately that this concession belongs to someone and that the relevant permission must be obtained before one ventures further.

4.4.3 The nature and extent of forest resources

A reconnaissance survey and a forest inventory are useful ways to start collecting data on the nature and extent of the forest resources (see Annex III for useful tools).

The GFC and the EPA frequently asks new developers in the forestry sector to carry out EIAs that involve in part, collecting very basic data on the concession area. The GFC also issues SFEPs to new developers in order that they may collect basic data on the concession area of interest before formulating their business plans.

A reconnaissance survey involves the collection of data on:

a) Current land use practices within the area
b) Communities within the area and whether some residents are available for employment
c) Options for accessing the area, including routes for conveying timber or other products from the concession area
d) The roads and trails in the area, their orientation, their condition and who uses them and for what purposes
e) Other logging, forest based enterprises or conservation measures in the area including eco-tourism or biodiversity reserves
f) Special indigenous assets to be preserved.
g) Options for setting up the main administrative centre and forward camps

A forest inventory involves obtaining quantitative data on the forest resources mainly in terms of estimated volume per hectare, estimated number of commercial trees per hectare, estimated number of the key species per hectare, and the distribution of the forest types to allow the developer to obtain a basis for investment. More importantly, the size of trees and the overall volume will help decide cutting levels in terms number of trees per species, total number of trees and the minimum diameter for trees to be felled.

4.4.4 Requirements for timber production.

In order to manage forests as a business, one needs to consider:

a) The species composition within the area (and in particular the relative proportion of commercial versus non-commercial species).

b) The technological characteristics of the most important species (in other words, for the existing species, what could the species be used for)

c) The distribution of diameter classes (the relative sizes of the trees, and in particular, the number of trees with bole diameter >33cm –the legal limit for felling trees). Although the DBH rule is not applicable to private or communal forests, it is a useful standard for holders of such forests to adopt to ensure sufficient residual trees.

d) Technological options: what product(s) to harvest, in what quantities and in what manner

e) Marketing options: who wants to buy the products available, where, in what quantities, over what time and what price are they willing to pay.

f) Social considerations: the availability of skilled labour, training requirements, cultural or religious concerns. (Members of the Seventh Day Adventist Church will not work on Saturdays and such employees require separate considerations).

These considerations guide the collection of data, and the data obtained must be sufficient to form the basis for planning a viable logging operation. Once the data is obtained it must be organised.

Vegetation data superimposed on topographic maps are available from the GFC and provide an excellent starting point for planning because forest types are easily related with terrain; however a management level forest inventory and a reconnaissance survey are useful for getting information on the current or actual conditions on site.

Information of soils and geology in the concession area are also important because these have an impact on road construction activities. Such maps are also available from the GFC for a small fee.

4.5 Reduced Impact Logging

4.5.1 Reduced Impact Logging (RIL)

RIL entails the planning of every operational activity. RIL consists of technologies and practices that are designed to minimize environmental impacts associated with commercial timber harvesting operations. There is no single, globally applicable definition of what constitutes RIL because the specific procedures adopted, the environmental standards, and the types of logging equipment used vary with local conditions.

4.5.2 The Basic Elements of RIL phase

Forest organisation:

- Operational plan, compartments, blocks

Planning phase:

- Pre-harvest inventory and mapping of individual crop trees and terrain,
- Cutting of vines

- Pre-harvest planning and indication of roads, skid trails, and landings (on maps)

Pre-harvest activities phase

- Locate and demarcate roads, skid trails, and landings on the ground
- Determine felling direction for each tree based on skid trail lay-out and environmental guidelines
- Mark protected trees (potential crop trees, seed trees, habitat trees) near trees to be felled and along skid trails
- Prepare roads, skid trails, and landings
- Construct roads, landings so that they adhere to engineering and environmental design guidelines.
- Pre-construct skid trails (optional)

Harvesting phase

- Use directional felling and proper bucking techniques, to minimize damage to the residual stand, to avoid waste, and to maximize volume and value recovery
- Winch logs to planned skid trails and ensure that skidding machines remain on the planned skid trails at all times.

Post-harvest phase

- Restore drainage along skid trails by deactivating skid trails after the operation (e.g., by cross ditching) to minimize erosion or water logging conditions.
- Restore drainage of log landings
- Conduct post-harvest assessments to provide feedback to the timber concession holder and the logging crews.

5. STOCK MAPS

Good quality stock maps are essential for good forest management. Stock maps are very useful for summarising information on progress with the timber harvesting operations. Three main types of stock maps are frequently used.

5.1 Concession level stock maps

The typical concession level stock map (see Figure 7) shows in the main baseline data on topography and developmental or administrative measures taken:

(a) Topographic data

a) The nature and extent of forest types,
b) water courses,
c) elevation,
d) neighbouring concessions

Administrative/developmental measures

e) Constructed and planned primary roads and the corresponding bridges and culverts
f) The main administrative centre and its relationship to forward camps
g) The location and extent of compartments
h) The position of key access points for the concession
i) The location of signboards
j) The location of communities within the concession area

5.2 Compartment level stock maps

Only the scale of the map limits the amount of information that could be displayed on compartment level stock maps (see figures 8).

The blocks in the compartment

a) Extent of the compartment and position relative to other compartments
b) Soil types, forest types and topographic data
c) Blocks harvested and blocks to be harvested
d) Blocks where pre-harvest inventory has been completed and blocks where pre-harvest inventories are planned (over the next year or so).
e) The network of planned roads and constructed primary, secondary and access roads respectively and associated structures such as bridges and culverts
f) Log markets
g) Forward camps
h) Key protected areas
i) Forest reserves and protected areas
j) Position of sign boards and other notices

5.3 Block level stock maps (see Figure 9a and 9b).

These show in the main:

a) Skid trails and log markets
b) Buffer zones
c) Protected areas
d) The location of selected commercial trees within the block

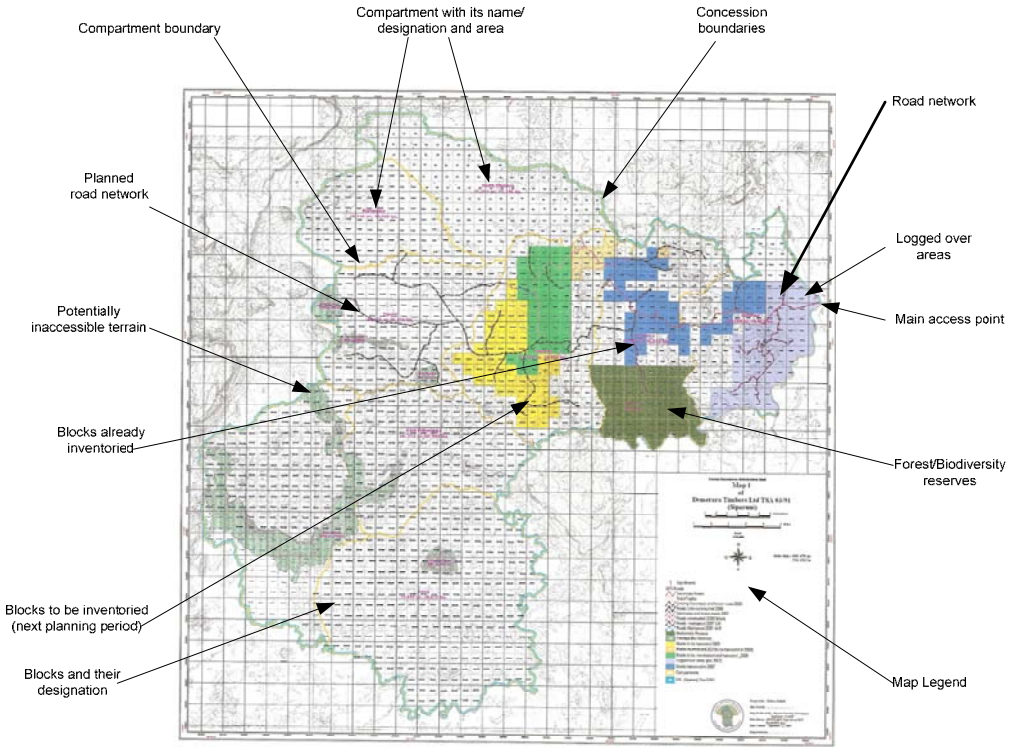

Figure 7: Specimen of a concession level stock map.

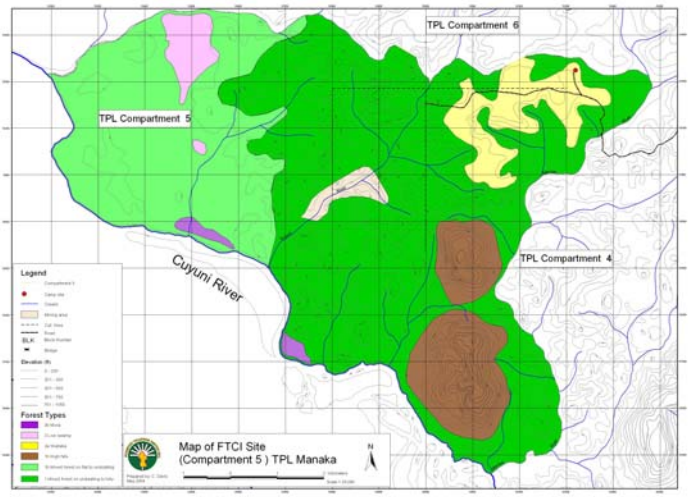

Figure 8: Specimen of a stock map at the compartment level.

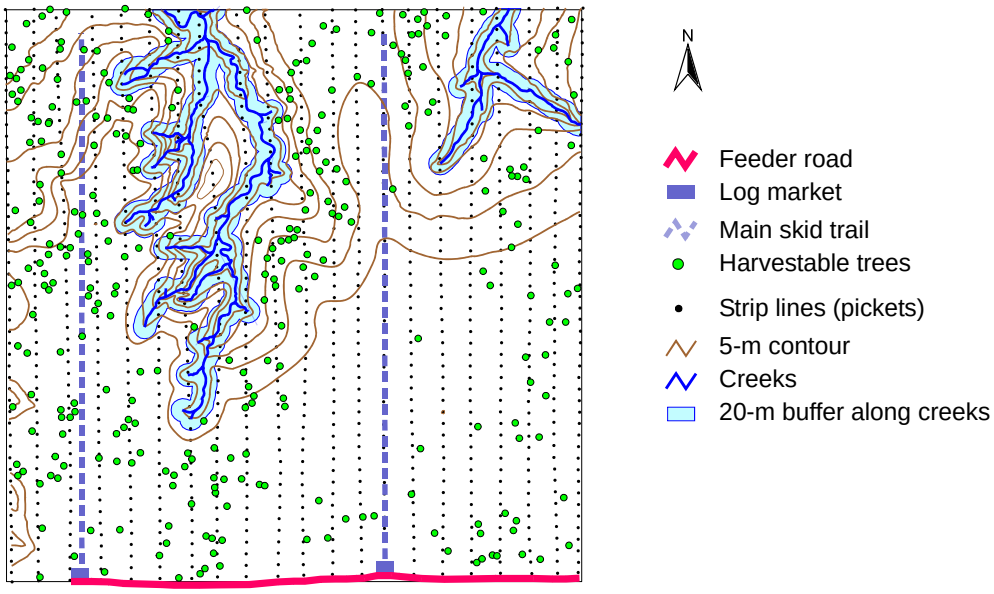

Figure 9a: Specimen of a stock map at the block level

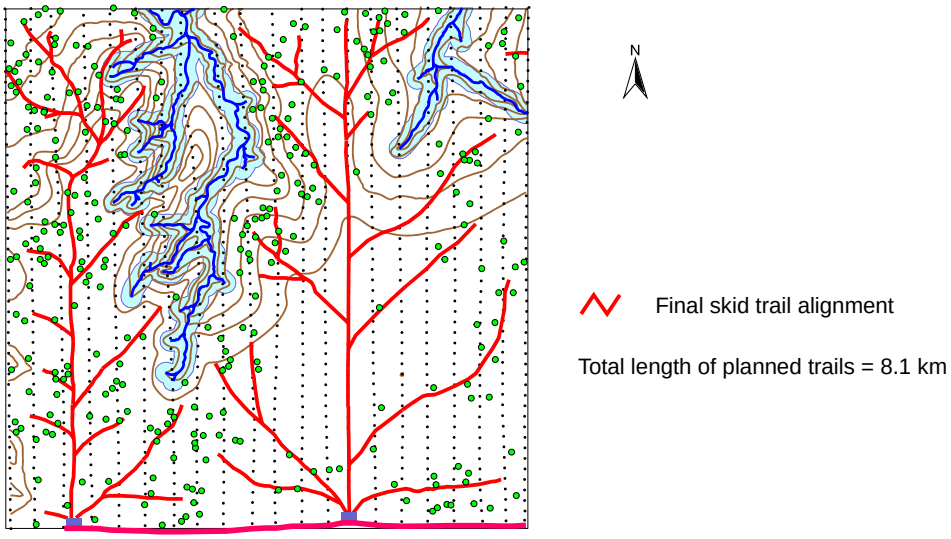

Figure 9b: Specimen of a stock map with skid trails at the block level

6. FOREST CONSERVATION

6.1 Concept

Conservation in forestry not only implies wise use of the resources but the adoption of active measures to ensure commercial stock at short term intervals and prevent undue commercial or ecological degradation of forests. Two primary forest conservation measures are control of yield-regulating the volume harvested per unit area and silvicultural practices.

6.2 Yield Control

Yield control is an important component of forest management because by controlling yield, sufficient commercial timber will be available at specific cycles, and the capacity of the forest to renew itself will be preserved. Foresters have grappled with the question: what is the most effective but practical manner to regulate forest production. Diameter limits, species protection, and volume area limits have been the primary methods used to regulate how much timber should be harvested.

6.2.1 Diameter Limits

Diameter limits are a common method of regulating yield. For example, the forestry authority may decide that no tree with diameter less than 30cm may be felled. The hope is that trees under 30cm will attain or exceed that limit within a reasonable period and allow the harvesting of a second crop of timber. The diameter limit is chosen based on the mean size of merchantable trees-trees big enough to display their best technological properties but not big enough to display may defects or biological degrade. A major challenge in topical forests is that the actual age of trees are unknown, and frequently different species of the same age may be vastly different in their ages. Diameter limits may apply to all trees or there could be diameter limits per species or for groups of species, based on their technological and utilization properties.

Diameter limits as the only method of yield control is frowned upon because it allows for all trees exceeding the diameter limit to be felled; and where such trees occur in close proximity to each other, significant gaps (or degraded areas) are produced.

6.2.2 Volume/area limits

In this method, using a number of formulas, a cutting cycle is established for the area; for example, if the cutting cycle is 60 years then each parcel or block of forest may only be cut once. Secondly based on data on tree growth and on actual forest stocking gleaned from inventories, a maximum volume per hectare is agreed or prescribed.

In Guyana, the yield per hectare is proportional to the cutting cycle in such a way that the longer the cycle, the higher the yield per hectare. (A 60 year cycle allows a yield of $20m^3$, while a 50 year cycle allows $16.6m^3$). In practice, the productive area of the concession is divided by the value of the cutting cycle; then the annual allowable area is multiplied by the approved yield per hectare to establish the annual allowable cut.

For example (in Guyana), a forest concession agreement for a concession area of 10,000 hectares has a productive area of 9,050 hectares and will operate with a 50 year cycle. The annual allowable area will be 9050/50= 181 hectares/year, then the annual allowable cut will be 181 x 16.6 = 3,004.6m^3.

6.2.3 Species Protection

This simply entails a prohibition on the harvesting of one or more species based on calculations on the actual number of trees per unit area (its scarcity) or fears that the species is so endangered that it should be protected at all costs.

6.3 Silviculture

Silviculture may be defined as the art of establishing tree crops and controlling their composition and growth. Essentially, forests aim to conserve forests by actually planting trees, by physically enriching a parcel of trees with certain fast growing, high value commercial species or by establishing plantations of high value species to avoid or reduce the rate of harvesting of natural forests.

6.4 Other forest conservation measure

6.4.1 Laws, Codes of Practice

Many countries conserve forests by producing Laws and Codes of Practice which aim to:

a) Regulate the size of gaps (distance between trees, prescribing the width of roads, the size of log markets)
b) Minimize hazards such as fires, water logging which can lead to forest degradation or forest loss
c) Control the disposal of potential pollutants which can lead to forest degrade
d) Place restrictions on hunting to ensure sufficient stocks of fauna to maintain plant pollination and seed dispersal processes

6.4.2 Forest reserves & protected areas

Many countries deliberately set aside significant representative parcels of natural forest as forest reserves, where no interventions for commercial harvesting of timber are allowed.

6.4.3 Reduced impact logging

RIL, with its emphasis on planning all interventions allows post harvest forest conditions not very different from the original forests, there is a mere reduction in commercial stock.

7. OCCUPATIONAL SAFETY & HEALTH

7.1 Introduction

Forestry is one of the most hazardous industrial sectors in most countries around the world. Safety at work is not only ethically imperative but also makes economic sense. Good occupational health and safety performance in forestry depends on the awareness and required attitude of workers.

7.2 Employer's commitment

The employer's commitments include the provision of a safe working environment for employees and the installation and maintenance of systems and methods of work which are safe and without risk to employees' health.

7.3 Orientation and training

Occupational health and safety orientation is necessary for all employees of all logging companies. The company should hold training seminars on safety. The company should have an accidents and incidents investigating committee. Training of employees should be both initial and continuing. Individual proficiency verification would be an asset for employer and employees.

7.4 Benefits of a safety programme

The benefits of a safety programme include: saving lives and preventing injury; reducing unnecessary damage to equipment; increasing job efficiency and production; and providing better job satisfaction and higher working morale.

7.5 Occupational health and safety practices

All personnel who enter the forest whether as a worker or observer must be equipped with some basic safety apparel: safety helmet, safety footwear, high visibility garments, suitable clothing (see figure 10).

Figure 10: Specimens of basic safety items for forest operatives

Eye protection and protective apparel for other parts of the body should be worn whilst working with impact tools. Effective ear protection should be used. Additional equipment

should be carried in a manner that leaves the hands and feet free. Dangerous equipment e.g. sharp, edged tools should be sheathed, and operated in a safe manner. Flammable fuels and oils, dangerous chemicals and explosives should be carried in approved containers, transported and stored in the approved manner and used in compliance with the appropriate laws and guidelines. Chemicals used in the forest should be handled with care and protective apparel must be worn.

Supervisors must act to rectify dangerous behaviour. Persons should be made aware of potentially dangerous situations. All personnel should be made aware of the danger of falling objects within the forest. Under no circumstances should anyone work in the forest under the influence of drugs or alcohol. Persons taking over the counter drugs should seek medical advice before engaging in field work. The employer must maintain a register of all work-related illnesses, accidents, or near misses that occur at the work place.

8.0 INTRODUCTION TO MARKETING

8.1 Definition

We may define marketing as the process of planning, developing, promoting, distributing and selling ideas, goods and services that meet the needs of individuals, communities, and organizations.

Marketing is more than just selling. When we really want to sell something we advertise it more often, we reduce its price or we add certain bargains or incentives to encourage people to buy the item. Marketing focuses on getting buyers what **they** want. If people want kiln dried lumber, then we will organise our productive assets to produce the kiln dried lumber. Marketing is an ongoing process because what people want today may be very different from what they want tomorrow.

8.2 Marketing and forest management

The basis for forest management is the production of some goods or services which people want; once we know what people want and we have the capability to produce to the standard required, the higher the probability of a successful enterprise.

It follows then that the use for the timber of any tree at our disposal should be determined and the timber should be 'sold prior to felling the tree. We should avoid felling trees first, and then trying to sell the timber afterwards. Source a consumer, determine what that consumer wants, then create the operations to generate the product. Once a community knows that people want *crab oil* or *organic cocoa* or *access to good fishing grounds*, it is relatively easy to first of all make a decision about whether the community has the capability to get involved in the venture to produce such items or services

8.3 The essentials 4Ps of marketing

The essential 4Ps of marketing are:

Product: entails finding out what customers want and what can actually be produced taking into account available technology and the structure of costs;

Place: Distributing products-seeking out feasible ways to get the products to the from the forest or mill to the end consumer

Promotion: Promoting products - promotion involves advertisement, product labelling and favourable press coverage and praise from other consumers;

Price: Pricing products to maintain consumer interest and demand while trying to maximise profits to ensure a viable enterprise.

8.4 The need to understand marketing

We need to understand marketing for three fundamental reasons:

Customers are the reason why businesses exist; therefore marketing is important to every forest enterprise. It is essential to obtain and **conserve the interest of consumers** in the products we sell; and we need to be alert to trends in consumer behaviour so we can adjust our marketing to meet their requirements.

The promotion and distribution of timber and non-timber products frequently account for more than half **the price of a product**. A good understanding of marketing can therefore help us keep our costs down or at least allow us to compete with other producers.

Thinking about marketing considerations lead to better entrepreneurs. Thinking about consumer needs and ways of meeting such needs in a timely manner help individuals, communities and organizations better **manage businesses to adapt to emerging challenges** and consumer interests.

8. 5 Niche Markets

Niche market refers to a specialized and targeted but profitable segment of a market. A niche market is in fact a narrowly defined group of potential customers. An enterprise that focuses on a niche market, addresses a need for a product or service that is not being catered for by mainstream providers.

Niche markets are useful because:

- niche markets frequently tap relatively small high value resources
- other businesses may not be aware of a particular niche market
- some large businesses may not want to bother with a niche market because it's too small for them (not profitable enough)

8.6 Getting ready for the market-key questions to consider

Some useful questions for reflection before entering a particular market are:

a) Do you have the products for your market type?
b) What do you need to do to enter your preferred market?
c) Do you have the personnel and team to help you enter the market?
d) What do you expect to achieve in this market?
e) How do you give yourself the greatest chance of being successful in the market (in terms of quality, reliability)?
f) How do you want to distribute your products?
g) Who can you turn to for assistance?

9.0 MANAGING BUSINESSES

9. 1. Introduction-the business management

We have looked at some basic technical considerations in managing a forest enterprise or a timber business. However, we need more business training in order to manage a forest enterprise. Many communities and many timber companies have been unable to sustain their enterprises due to a lack of business training. This chapter sets out some simple fundamentals of managing a business or an enterprise.

9.2 Organizations and objectives

Enterprises comprise people who share a common purpose and are organized for the achievement of specific objectives. Consider for example, a forest based community that wish to foster the development of their communities by building health centres or a new school and training its own members to be nurses and teachers. To raise funds, the members of the community could get involved in the commercial production of forest based products such as timber, aquarium fishing or honey or alternatively in the provision of eco-tourism services. The members of the community would therefore organize themselves and work for the common purpose of providing products or services. That common purpose is called an objective. One objective of any individual, community or organization engaged in business is to make a profit. Other objectives could include the supply of high quality lumber or organic honey. Whatever the objective, the members of the community must be organized for the work of management.

9.3 The work of management

Many communities normally set up a small team specifically for the work of management by assigning key responsibilities (and decision making power) to certain members and in turn demanding from them certain reports at frequent intervals.

The work of management is to focus on what is to be managed-the organization itself. Essentially, the manager is required to carry out four (4) broad functions in an organization:

- Planning
- Organizing and directing
- Controlling
- Decision-making

These functions are carried out simultaneously

9.3.1Planning

In planning, the manager outlines the steps to be taken in moving the organization towards its objectives. These plans will be both long and short term in nature. Long term planning is basically strategic planning which occurs in two phases:

(a) Making a decision on what products or services to render
(b) Deciding on the marketing and/or manufacturing strategy to employ in order to get the intended products or services to the customer.

Management next steps will be to develop short term plans such as working capital needs, financing purchases, and organization of field work. As these plans are made, they will be communicated throughout the organization. When they are implemented both the long and short term plans will serve to coordinate the efforts of all parts of the organization towards the objectives.

9.3.2 Organizing and Directing

In organizing, a manager decides how best to put together the organization's and other resources in such a way as to most effectively carry out the established plans. For example, as a customer enters the Sawmill, certain employees will perform specific functions, some directly with the customer and some not. The physical assets – the lumber will be arranged in particular ways, and certain procedures will be followed if a sale is made.

In order for the Sawmill to move towards its profit objectives, the manager must visualize and fit together the structure that is needed to get the jobs done.

In directing, the manager oversees the day-to-day activities and keeps the organization functioning smoothly. Employees are assigned to tasks; questions are answered; disputes between employees are arbitrated; on-the-spot problems are solved; and numerous small routine and non-routine decisions are made involving customers and/or procedures. In effect, directing is that part of the manager's work that deals largely with routine activities.

9.3.3 Controlling

In carrying out the control function, the manager is required to take those steps to ensure that each part of the organization is following the plan that was outlined for it at the planning stage. To do this, the manager studies the accounting and other reports and compares them against the plans set. These comparisons may show where operations are not proceeding effectively and corrective action is necessary. Accounting and other reports coming to management are called feedback.

The feedback that management receives may suggest the need to revise existing plans, to set new strategies, or to redesign the organization structure. Feedback is a key to the effective management of any organization.

9.3.4 Decision-Making

In decision-making, a manager attempts to make rational choices among alternatives. It should be noted that decision-making is not a separate management function, per se; rather, it is an inseparable part of the other functions already discussed. Planning, organizing, directing and controlling all require that decisions be made in the interest of the organization's overall well-being.

All decisions are based on information. The quality of management's decisions will be a reflection of the quality of the accounting and other information that it receives. Simply put, bad information will generally lead to bad decisions.

9.3.5 The Planning and Control Cycle

The work of management can be summarized in a model such as that shown in Figure 11. This model, which depicts the planning and control cycle illustrates the smooth flow of management activities from planning through organizing, directing, and controlling and then back to planning again. All of these activities require decisions to be made.

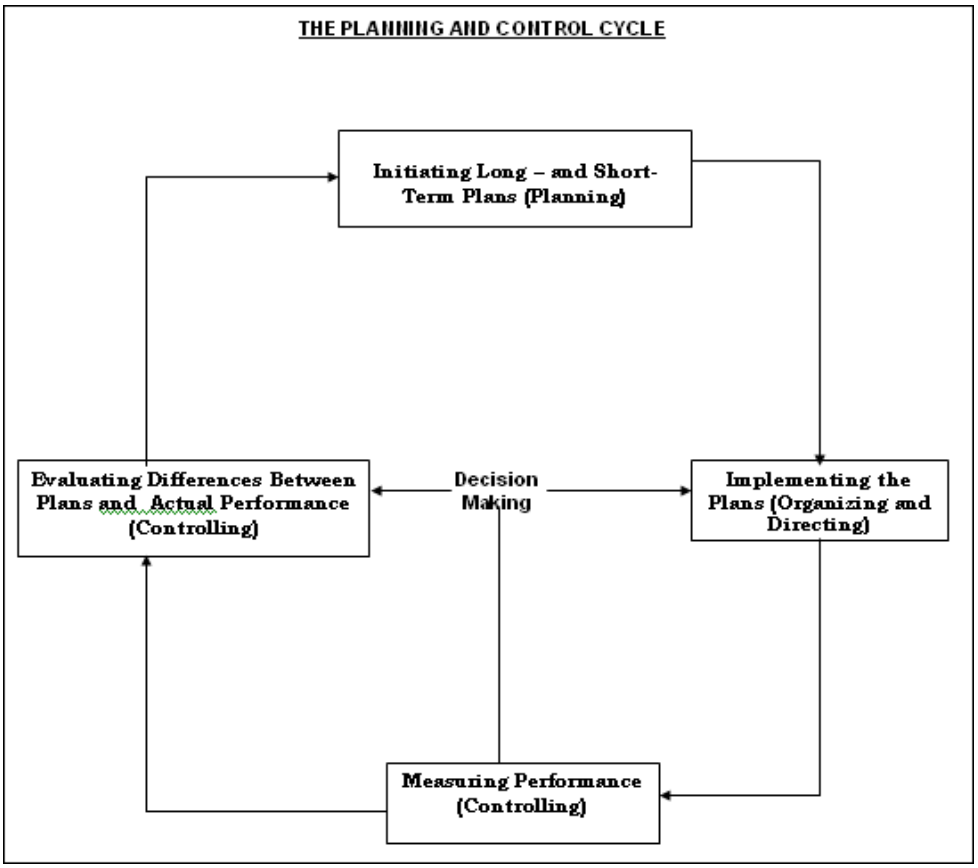

Figure 11: Depiction of the planning and control cycle

9.4. The Finance Manager

The manager in charge of the accounting department is known as the Finance Manager (FM). The FM is a member of the top management team and an active participant in the planning, control and decision-making processes. By supplying and interpreting relevant and timely data, the FM has a significant influence on decisions, and thus plays a key part in directing an organization towards its objectives.

As a member of the top management team, the FM is generally kept free of technical and detailed activities. The FM is required to oversee the work of others, directs the preparation of special reports and statements, etc. and advises top management on all financial matters.

9.5. Accounting Information

Information provided by accounting which is essentially financial, is required by the manager to carry out the planning, organizing and directing, controlling, and decision-making functions. Such use of accounting information is illustrated hereunder.

9.5.1 Planning

Management's plans are expressed in the form of budgets. They are prepared under the direction of the FM and assisted by the staff of the accounting and other departments. Budgets usually express the goals of management in quantitative terms and on an annual basis. As an example, the Marketing Department/Section of a Sawmill business will provide the Accounting Department with the estimated volume of species of lumber to be sold and estimated prices. These plans will be expressed as departmental budgets and communicated throughout the organization.

9.5.2 Organizing and Directing

The managers throughout the organization will be required to obtain a constant flow of accounting information in the routine conduct of day-to-day operations. For example, the organization structure of the Marketing Department must be fully staffed to execute the sales plans for the ensuring year.

9.5.3 Controlling

Once the budgets have been set, management will need information inflows which will indicate whether there are variances from these plans and its extent. Accounting assists in meeting these information needs by supplying periodic (monthly/quarterly) Performance Reports to help focus the managers' attention on the problems and/or areas which might otherwise go unnoticed. A Performance Report is a detailed report to management comparing budgeted data against actual data for a specific time period. In a situation where there are problems, then it is expected that corrective action will be taken promptly. If on the other hand, the Report indicates that things are going well, then the manager is free to do other work. Hence, Performance Reports are a form of feedback to managers, directing their attention towards these parts of the organization where managerial time can be used more efficiently and effectively.

9.5.4 Decision-Making

Accounting information is often a key factor to analyze methods of solving problems. The reason is that various alternatives usually have specific costs and benefits that can be used as an input in deciding which alternative is the best. Accounting is generally responsible for gathering available costs and benefits data, and thereafter to communicate it in a usable form to the appropriate manager. As an example, this Sawmill may discover that its competitors are making inroads in its market share. In deciding among the alternatives of reducing prices, increasing advertising, or doing both in an attempt to maintain its market share, the Sawmill will have to rely heavily on cost-benefit data provided by accounting. In some instances, the required information may not be readily available; in fact, accounting may find it necessary to do a large amount of analytical work including forecasting, so that the required data can be prepared.

9.5.5. Cost Accounting

Dramatic changes have taken place in production methods over the last three decades. The widespread use of computers has brought about a dramatic reduction in the cost to record, store and analyze information. The move towards automation is causing a shift away from labour costs, with the results that labour costs are becoming less of a factor in total costs for both manufacturing and service activities. Increased business competition that has become global in scale has spurred the development of cost accounting. A Cost is an amount, measured in money, of the expenditure to obtain goods or services. And Cost Accounting is that branch of accounting concerned with providing information to managers for use in planning and controlling operations and for use in decision-making.

Rather than just employing cost accounting to direct the affairs of their businesses, managers are now focusing on cost accounting. Cost Management is different from cost accounting in that it goes beyond the mere accumulation and reporting of costs. It requires that managers consider how effectively resources are being used to create, and intense competition; if resources are not consumed effectively through careful cost management, then the long term strategic goals of a business will unlikely be met. Cost Management is the effective use of resources to create market, and distribute products and services to customers.

9.6. Financial Accounting

Financial Accounting is that branch of accounting that is concerned with providing information to stockholders, creditors, and others who are outside the organization for use in evaluating operations and current financial position.

The financial operations are recorded in the organization's Income Statement which summarizes the items of income, expenses, and the net effect-a profit or a loss. The financial position is the organization's Balance Sheet which is a concise statement, showing assets, liabilities, and owners'/stockholders' equity in a classified manner and at a particular moment of time. In effect it is a statement of current resources, unexpired costs, liabilities to be met and sources of ownership funds, rather than a statement of economic worth.

Financial accounting statement is required to be prepared in accordance with generally accepted accounting principles. The reason is that these statements are relied on by persons outside the organization such as the creditors and the stockholders. Those outside persons must have some assurance that the information they are receiving has been prepared in accordance with some common set of rules; otherwise great opportunity could exist for fraud or misrepresentation.

9.7. Similarities between Financial and Cost Accounting

Both financial accounting and cost accounting rely on the accounting information system. It would be a total waste of money to have two different data-collecting systems existing side by side. Hence, cost accounting makes extensive use of routinely generated financial accounting data.

Secondly, both branches of accounting rely heavily on the concept of responsibility, or stewardship. Financial accounting is concerned with stewardship over the organization as a

whole; cost accounting is concerned with stewardship over its parts, and this concern extends to the last person in the organization who has any responsibility over costs.

9.8 Cost terms and concepts

9.8. 1 Introduction

As explained in Section 9.3, the work of management is centred on:

1. planning, which includes setting objectives and outlining the means of attaining those objectives
2. control, which includes the steps taken to ensure that objectives are realized.

In order to carry out the planning and control functions, the manager needs information about the organization. From an accounting point of view, the information needed is most often related to the *costs* of the organization.

In financial accounting, the term cost is defined as the sacrifice made to obtain some good or service. This sacrifice is commonly measured in cash expended or service rendered.

In cost accounting the term cost is used in many different ways. This is due to the many different types of costs, and these costs are classified differently according to the immediate needs of management. Hence in this Section, a look is made at some of these different types of costs, and at some of the ways in which managers classify them for their own use internally.

9.8.2. Manufacturing Costs

An organization involved in manufacturing is more complex than most other types of organizations. Such an organization is broader in its activities, such as production as well as in marketing and administration. An understanding of the cost structure of a manufacturing organization therefore provides a broad, general understanding of costing that can be very helpful in understanding the cost structures of other types of organizations.

Manufacturing involves the conversion of raw materials into finished products through the efforts of workers and the use of production equipment. By contrast, merchandising is the marketing of products that are in a finished form and that have been acquired from a manufacturer or other source. The cost of a manufactured product is made up of three basic elements:

- Direct Materials
- Direct Labour
- Overhead

9.8.3. Direct Material Costs

A wide variety of materials can go into the manufacture of a product. These are generally termed raw materials. This term is, by and large, misleading in that raw materials seem to imply basic, natural resources. From an accounting standpoint, raw materials are inclusive of any materials input into a product. The finished product of one company can become the raw

materials of another company. As an example, the finished lumber products of a Sawmill become the raw materials of a Construction Company, engaged in building houses.

Raw materials are those materials that become an integral part of an organization's finished product and can conveniently be traced to it. Some items of materials may become an integral part of the finished product but may be traceable into the product only at a high cost and also inconvenience. Such items might include nails used to construct a house. Nails would be classified as indirect materials and hence, would be included as part of overhead costs.

9.8.4. Direct Labour Costs

The term direct labour is reserved for those labour costs that can be traced to the creation of products and without undue cost or inconvenience. For example, direct labour costs are costs incurred in producing lumber from logs.

Labour costs that cannot be physically traced to the creation of products, or that can be traced only at great costs and inconvenience, are termed indirect labour. This is treated as part of manufacturing overhead along with indirect materials. Indirect labour includes the labour costs of supervisor(s), casual workers and security guards. Although the efforts of these workers are essential to production, it would be either impractical or impossible to accurately relate their costs to specific unit of product.

Due to automation, direct labour is decreasing in importance as organizations replace workers with equipment.

9.8.5. Overhead Costs

Overhead Costs is the third element of product cost. It includes all costs of manufacturing except direct materials and direct labour. Included in this classification would be such costs as:

1. indirect materials
2. indirect labour
3. electricity
4. property taxes
5. insurance
6. depreciation
7. repairs
8. maintenance

An organization also incurs costs for electricity, property taxes, depreciation, and so forth associated with its selling and administration functions, hence those costs are not classified as overheads.

It should be mentioned that overhead is known by various names. It is sometimes referred to as manufacturing expense, factory expense, or factory overhead. All these terms are synonymous with overhead costs.

9.8.6. Current Practice

Most organizations in Guyana tend to be more labour intensive. Heavily automated organizations tend to have high overhead costs.

The average combination of the three costs elements for a labour intensive organization is:

1. Direct Materials 45%
2. Direct Labour 35%
3. Overhead 20%

And for an automated organization:

1. Direct Materials 55%
2. Direct Labour 10%
3. Overheads 35%

9.8.7. Non Manufacturing Costs

Traditionally, the central focus has been on manufacturing costs and activities. Perhaps the primary reason is probably traceable to the complexity of manufacturing operations, and to the need for carefully developed costs for pricing and other decisions. However, costing techniques are now being applied to many non-manufacturing areas. Hence, organizations are now attempting to have better control over their costs, and also to provide management with more usable cost data.

Manufacturing costs are sub-classified into two categories:

1. Marketing or selling costs
2. Administrative costs.

Marketing or selling costs include all costs necessary to secure customer orders and to get the finish product or service into the hands of the customer. Marketing costs therefore relate to contacting customers and providing for their needs. Examples of marketing costs include:

1. advertising
2. shipping
3. sales commissions
4. sales staff salaries
5. warehouse.

Regardless of whether organizations are manufacturing, merchandising (trading) or service in nature, they have to incur marketing costs.

Administrative costs include all executive, organizational, and clerical costs that cannot logically be included under wither production or marketing. Examples of such costs include:

1. executive emoluments
2. general accounting
3. secretarial
4. public relations

and similar costs having to do with the overall, general administration of the organization as a whole. Similar to marketing costs, all organizations also have administrative costs.

9.8.8 Exercise-Practice set

Classify the following cost items of a Sawmill business into the categories of:

- Raw materials - RM
- Direct Labour - DL
- Overhead - O
- Marketing Costs - MC
- Administrative Costs - AC

Cost Items:

- Advertising
- Insurance – Office
- Executive Emoluments
- Maintenance of Equipment
- Lumber Cutters
- Shipping
- Electricity
- Secretary Emoluments
- Lumber
- Insurance – Field Equipment
- Sales Commissions
- Public Relations
- Repairs to Tractor
- Property Taxes – Office
- Depreciation
- Fuel & Lubricants

Use the abbreviation, for example RM refers to Raw Materials.

Solution for Exercise 1	
Cost Items	**Classification**
Advertising	MC
Insurance – Office	AC
Executive Emoluments	AC
Maintenance of Equipment	MO
Lumber Cutters	DL
Shipping	MO
Electricity – Office	AC
Secretary Emoluments	AC
Lumber	RM
Insurance – Field Equipment	MO
Sales Commissions	MC
Public Relations	AC
Repairs to Tractor	MO
Property Taxes – Office	AC
Depreciation – Tractor	MO
Fuel & Lubricants	MO

9.9 Key Terms for Review

- Administrative costs: All executive, organizational, and clerical costs associated with general management of an organization.
- Balance Sheet: A concise statement, showing assets, liabilities, and owners'/stockholders' equity in a classified manner and at a particular moment of time.
- Budget: A detailed plan for the future, usually expressed in formal quantitative terms.
- Control: The process of instituting procedures and then obtaining feedback as needed to ensure that all parts of the organization are functioning effectively and moving toward overall company goals.
- Cost Accounting: A branch of accounting that is concerned with providing information to managers for use in planning and controlling operations and for use in decision-making.
- Cost Management: The effective use of resources to create market, and distribute products and services to customers.

- Decision-making: The process of making rational choices among alternatives.
- Direct labour: Those factory labour costs that can be physically traced to the creation of products.
- Direct materials: Those materials that become an integral part of a finished product and that can be conveniently traced onto it.
- Directing: The overseeing of day-to-day activities in order to keep an organization functioning smoothly.
- Feedback: Accounting and other reports that help managers monitor performance and focus on problems and/or opportunities that might otherwise go unnoticed.
- Indirect labour: The factory labour costs of supervisors, casual workers and others that cannot be traced directly to the creation of products.
- Indirect materials : Small items of material such as nails that may become an integral part of a finished product but that are traceable into the product only at great cost or inconvenience.
- Manufacturing: The conversion of raw materials into finished products through the efforts of workers and the use of production equipment.
- Marketing or selling costs: All costs necessary to secure customer orders and get the finished product or service into the hands of the customer.
- Planning: The development of objectives in an organization and the preparation of various budgets to achieve these objectives.
- Planning and Control Cycle: The flow of management activities through the steps (in sequence) of planning, organizing and directing, controlling, and then back to planning again.
- Organization: A group of people united for some common purpose.
- Overheads: All costs associated with the manufacturing process except direct materials and direct labour.
- Performance Report: A detailed report to management comparing budgeted data against actual data for a specific time period.
- Raw materials: Any materials going into a manufactured product.

10.0 RECORDS

It is important to maintain operational records to help monitor whether goals are being met, to help monitor costs, to help appropriate agencies (for example, commercial banks and the GFC) to monitor operations and compliance with operational criteria set by those agencies.

Although, many agencies including the GFC request records from logging enterprises, including community based enterprises, the records are in fact very valuable tools for the enterprises themselves.

Important records that should be kept by every logging enterprise include:

a) Employment matters (employees x gender x nationality)
b) Remuneration records especially as these relate to contracts and statutory payments of income tax and NIS
c) Inputs (fuel and lubricants, rations, spares, etc.).
d) Production (volume x block x year)
e) sales (volume/markets/year)
f) industrial disputes or any major activity with trade unions
g) special projects with communities
h) log tags and removal permits registers
i) Accident register

Note that stock maps are also an excellent source of information and record keeping for logging operations planning and implementation.

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Annex 1: FMP Outline: Guyana Forestry Commission

Foreword
Acknowledgements
List of Acronyms

1. Introduction
2. Executive Summary
3. Company profile
4. Company policy towards national development
5. Section A: Background
   - Location and legal status
   - 5.1.1 Type of concession
   - 5.1.2 Geographic Location
   - 5.1.3 Description of boundaries
   - 5.1.4 Villages and neighbouring communities
   - Natural Environment
   - 5.2.1 Topography and hydrology
   - 5.2.2 Geology & Soils
   - 5.2.3 Climate
   - 5.2.4 Vegetation & forest types
   - 5.3 Area management history
   - 5.4. Economic environment
   - 5.4.1 Existing physical infrastructure
   - 5.4.2 Roads and bridges
   - 5.4.3 Communications
   - 5.4.4 Airstrip

6. Section B: Forest Management Planning (Future management)
   - 6.1 Objectives of management

7. Silviculture
   - 7.1 Silviculture Practices

8. Forest Use Organisation

9. Forest Inventory Practices
   - 9.1 Management level inventory
   - 9.2 Pre-harvest inventory
   - 9.3 Post harvest inventory
   - 9.4 Growth yield and defect data

10. Production Operations
    - 10.1 Yield regulation and production organisation
      - 10.1.1 Calculation of cutting cycle and annual allowable cut

- 10.2 Schedule of projected timber production
- 10.3 Other products to be harvested

11. Harvesting Operations
    - 11.1Machinery
    - 11.2 Logging procedures

12. Environmental Considerations
    - 12.1 Main objectives
    - 12.2 Protection
        - 12.2.1 Illegal operations
        - 12.2.2 Fire
        - 12.2.3 Pest and disease management
    - 12.3 Use of Chemicals
    - 12.4 Biodiversity reserves
    - 12.5 Coordination with other resource users

13. Monitoring and research

14. Social Issues
    - 14.1 Training initiatives
    - 14.2 Employment policies
    - 14.3 Issues of employee welfare
    - 14.4 Trade unions
        - 14.4.1 General Agricultural and Workers Union
        - 14.4.2 Guyana Labour Union
    - 14.5 Contractors

15. Markets and utilization
    - 15.1 Timber products for the next five years
    - 15.2 Markets for DTL
    - 15.3 Processing facilities

16. Records
    - 15.1 Records maintained by the concessionaire

17. Maps

Annex II: Outline of Annual Operations Plan: Guyana Forestry Commission

1.0 Introduction
- 1.1 Details of Concession Licence
- 1.2 Brief background of the company/individual
- 1.3 Linkages to the current Forest Management Plan

2.0 Review of work carried out in previous year
- 2.1 Area (ha) logged by compartment and felling block
- 2.2 Number of Trees and volume (m^3) felled per species, by compartment
- 2.3 Mean annual volume felled per hectare (m^3/ha)
- 2.4 Forest Inventory completed
- 2.5 Inventory methods and summary of results to date to be appended
- 2.6 Biological, ecological or other survey methodologies
- 2.7 Road construction or access completed (km)
- 2.8 Road maintenance completed (km)
- 2.9 Waterway access and maintenance (km)
- 2.10 Base/Forward Camps completed
- 2.11 List of Employees
- 2.12 List of work related accidents and or industrial disputes, if any
- 2.13 The Status of community based initiatives

3.0 Physical Infrastructural Works planned for next year
- 3.1 Road construction or access road completed
- 3.2 Road maintenance completed
- 3.3 Base/Forward camps planned
- 3.4 Waterway management
- 3.5 Forward camps projected

4.0 Inventory Operations planned for current year
- 4.1 Forest enumeration
- 4.2 Other biological, ecological, cultural surveys
- 4.3 Tree location maps
- 4.4 Plans for tree marking

5.0 Production operations planned for current year
- 5.1 Area (ha) to be logged by compartment, felling block
- 5.2 Number of trees, volume (m^3) to be felled per species

6.0 Other Operations planned for next year
- 6.1 Boundary demarcation and maintenance tasks
- 6.2 Concession monitoring activities
- 6.3 Procedures for the disposal of wood waste
- 6.4 Records, registers maintained by the company
- 6.5 Machinery assets available for use
- 6.6 Consultants, Contractors to be employed

7.0 Social Issues to be addressed in coming year

- 7.1 Workers, contractors and consultants to be employed
- 7.2 Occupational health and safety practices
- 7.3 Employee training projected
- 7.4 Outreach activities planned for nearby communities
- 7.5 Public awareness efforts
- 7.6 Community development efforts
- 7.7 Contracts in place

8.0 Significant policy changes since the submission the FMP

9.0 Interagency Collaboration

10.0 Collaborative activities with public agencies and NGOs

11.0 Maps

12.0 Annexes

Annex III: Useful tools for forest operatives

GPS Device

A **GPS Receiver** is a device that receives Global Positioning System (GPS) signals for the purpose of determining one's present location, mapping one's route, or determining the direction and distance (polar coordinates) relative to one's present location and any other location whose coordinates are known. In forestry it is used to establish plan surveying tasks (for example the starting points for lines), to monitor progress with and the accuracy of surveying tasks, and to validate field work.

Compass

A **Compass** is a magnetically sensitive device capable of indicating the direction of magnetic north; it is therefore used for determining direction relative to the earth's magnetic poles. The face of the compass generally highlights the cardinal points of north, south, east and west. It is used in forestry for conducting surveying works related to boundary demarcation, forest inventory and skid trail alignment.

Clinometer

A **Clinometer** is an optical device for measuring vertical angles. It is used in foresty mainly for establishing slope angles, which is critical in measuring horizontal distances in surveying and in road and skid trail construction. Clinometers may also be used for computing tree heights.

Diameter Tape

A **Diameter Tape** is a cloth or metal tape used to determine the diameter of a tree at breast height, by measuring the circumference of the bole at breast height. Diameter is one of the most critical measurements in forestry and is vital for the computation of the volume of the tree. Diameter tapes are also used to establish whether a tree meets the minimum diameter limit established by the GFC and the logger respectively.