

# Forestry and Logging

## Introduction

This Environmental and Social Risk Briefing covers the Forestry and Logging industry. Forestry is the practice of managing and using, for human benefit, the natural resources that occur on and in association with forested lands. Logging is the practice of felling and removing trees or the removal of dead or damaged trees from an area, most commonly followed by regeneration of the area to a tree crop. Operations such as land clearing, timber harvesting, timber processing, mechanical site preparation, silvicultural treatments and road construction are also discussed.

## Forestry and Logging

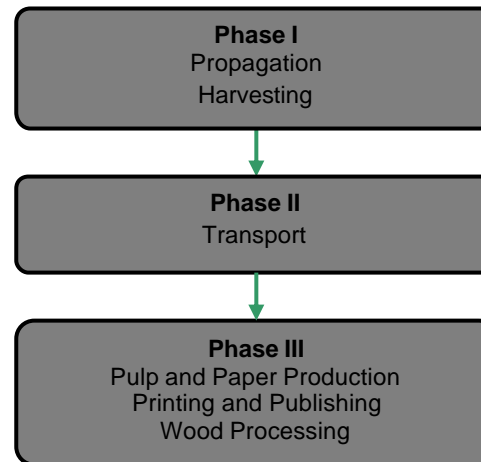
The Forestry and Logging life cycle is split into three main phases. The first phase encompasses the harvesting or felling trees, and forest regeneration. The secondary phase incorporates the movement of the trees / wood to a distribution or production facility. The third phase is the wood processing into a range of final products. Each phase will be discussed below.

### Propagation and Harvesting

Logging is the practice of felling trees, either selectively or by clear felling, and removing them from the forest. Most conventional logging is either for pulpwood production, for the

manufacture of paper or for saw logs for lumber production.

### Forestry and Logging Life Cycle



The standing tree is felled by chainsaw or large - scale machinery, de-limbed and cut into logs of variable length. Ground vehicles are then used to transport (pull, carry or shovel) the logs to the designated loading points where primary processing takes place into various log grades. The logs are transported out of the forests commonly by truck, which use access roads and tracks constructed through the forest.

After harvesting, regeneration activities are implemented. These vary depending on the proposed land use. Regeneration activities often include tools such as fire for encouragement of

seed germination, or hand planting of seedlings into prepared soil. Intensive land uses such as plantation development can involve substantial site preparation in removing post harvest debris.

Following the initial regeneration phase, most forests also undergo on-going management inputs, which may involve use of fertiliser for optimising plant nutrition, or chemicals or manual removal of undesired species.

### Transport

Logging roads are constructed to provide access to the forest for logging and other forest management operations. These vary markedly in road quality, and can include designs of a temporary nature only, such as use of natural surfaces and temporary bridges. Logging trucks when loaded, can carry up to 40 tonnes of wood. In some areas dedicated private use roads are created.

Construction of these roads, especially on steep slopes, can increase the risk of erosion and landslides, which can increase in downstream sedimentation. Logging roads can be the major source of eroded sediment long after actual logging operations are completed in an area. The decommissioning of these roads involves the restoring of natural habitat, which can be quite expensive.

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The cost to the public of such road building varies with each jurisdiction and the type of logging licence held by the operator. Although many roads are justified to the public as providing access for recreational and other non-logging users, in many places, a clear decision on the long term intended use of the land, and its related access needs, is not made. Similarly long life roads require on-going maintenance and costs need to be recognised to maintain the road value.

## *Processing*

The production of wood products can be broadly categorised into timber processing for solid wood timber, production of engineered wood products such as plywood and laminate veneers, production of reconstituted products such as medium density fibreboard (MDF) or particleboard, and finally pulp production which ultimately finishes in paper products. Much of the paper products go through some form of printing process.

## *Timber Products*

Softwood and hardwood timber is received, segregated, cut to size and dispatched to sawmills. Prior to dispatch the wood is often seasoned, heat treated or treated with preservatives. Wood preservatives impart protective properties to the wood guarding against weathering and attack by pests. The preservatives are applied to the surface of wood by pressure impregnation, by 'deluging' (a

mechanical application by flooding or spraying), by dipping or immersion or by thermal processing (immersion in a hot bath of preservative). The application of a vacuum helps to improve the effectiveness of the process and to prevent wastage.

Engineered wood products are made from veneers of solid wood that are bonded together under heat and pressure with strong adhesives. Depending on the type of product, the veneers are bonded either in aligned or perpendicular to each other. The veneers vary in thickness depending the desired end product. Many of the engineered wood products are then re-combined into differing configurations such as I-beams or plywood. Commonly timber undergoes drying and treatment with preservatives.

Reconstituted products can be manufactured from forest and sawmill residues, including bark and sawdust and mechanically produced wood chips. These are bound together using a synthetic resin and heat. Binding occurs in a heater press where the resin is cured at high temperatures. After curing, the board is cooled, cut to size and sanded to produce a smoother finish. Use of woodchips produces a high-grade product such as medium density fibreboard, whilst use of residues such as bark and sawdust tends to produce lower grade board such as particleboard.

## *Pulp and Paper Products*

Pulp is a concentrated mixture of fibres created from the conversion of raw materials, generally wood, recycled paper and agricultural residues and suspended in liquid. The pulp is then used to produce various paper and board products, often in combination with fine clays. The main stages in pulp and paper manufacturing are raw material preparation, pulp manufacturing, pulp bleaching, paper manufacturing and fibre recycling.

At the paper facility, water is added to the pulp mixture to produce very thin slurry, which is drained through a fine-mesh moving screen to form a fibrous web. This moving web is pressed and dried into a continuous sheet of paper. Residual moisture is then removed and further fibre bonding occurs when the paper is passed through a series of steam-heated cylinders. Final stages in the process include coating, further drying and calendering, where the sheet is pressed between metal rollers to reduce the thickness and smooth the surface. A wide range of paper grades are produced, ranging from high quality paper for magazine and wrapping papers, through newsprint down to carton and containerboard production used in transportation of many light goods and foodstuffs.

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## *Printing and Publishing*

There are several different types of printing processes: heat set web offset, gravure/intaglio, flexigraphic and cold set web offset. These processes use prepared ink and apply them to a material, usually paper. The inks may be water or solvent based. For most but not all the processes require that the carrier (the water or the solvent) is evaporated to leave the dry printed article. Where the carrier is a solvent this will give rise to solvent emission that in most cases are stringently regulated by countries.

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## Key Sector Risks and Headline Issues

In large-scale forestry and logging operations some critical issues of particular public concern may result in reputation or credit risk to an investor, these include:

- ◆ Legality of supply chain;
- ◆ Degradation of forest values and sustainability- loss and fragmentation of habitats - disturbance to protected species;
- ◆ Human rights of workers and communities;
- ◆ Ecological degradation/deforestation - cash cropping of soya, palm and rubber;
- ◆ Climate change - long term impact of deforestation and greenhouse gas emissions from processing;
- ◆ Sustainable community development;
- ◆ Involuntary resettlement and relocation
- ◆ Land rights of resource dependent communities
- ◆ Health risk of pollution arising from timber processing; and
- ◆ Forestry mining and clear felling – requirement for re-planting schemes
- ◆ Revenue Transparency

The following tables detail potential environmental and social risks associated with industry processes and appropriate control measures. These may include **Environmental and Social Management Plans**, which may form part of a wider **Environmental Social Management System**.

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## Environmental Risks

Life Cycle Phase and Activity	Environment	
	Risks	Controls
<b>Propagation and Harvesting</b>		
	<ul style="list-style-type: none"> <li>♦ <b>Pressure on natural resources -</b> <ul style="list-style-type: none"> <li>- Destruction of high conservation value forests</li> <li>- Non-sustainable harvesting of forest resource</li> <li>- Conversion of primary forest (i.e. currently uncut forest)</li> <li>- Changes in carbon dioxide levels due to the large scale forest clearing</li> </ul> </li> <li>♦ <b>Habitat depletion, fragmentation and degradation -</b> <ul style="list-style-type: none"> <li>- Natural and manmade habitats (e.g. disturbance to protected species; loss of fish farms and spawning areas due to siltation due to erosion)</li> <li>- Mudslides and landslides</li> </ul> </li> <li>♦ <b>Impact on terrestrial and aquatic ecology -</b> replanted trees, monoculture and / or low quality saplings)</li> <li>♦ <b>Employee health and safety -</b> dust and chemicals exposure,</li> <li>♦ solid/liquid waste (production and disposal)</li> <li>♦ <b>Disruption to surface water (hydrological) and groundwater (hydrogeological) systems and flows -</b> fuels, lubricants and ancillary chemicals from use of heavy machinery / spillage</li> <li>♦ <b>Bioaccumulation and contamination of food chain -</b> use of fertilizers and pesticides</li> </ul>	<ul style="list-style-type: none"> <li>♦ <b>Supply chain sustainability -</b> <ul style="list-style-type: none"> <li>- Identification and protection of high conservation value forests (HCVF) and primary forest</li> <li>- Confirm post harvesting land use with existing forest owners and other stakeholders and plan operations around these agreed land uses</li> <li>- Third party independent assessment of forest management performance and focus on sustainable harvesting, under internationally accepted schemes such as FSC.</li> <li>- Third party confirmation of sustainable wood supply through implementation of internationally recognised process of chain of custody</li> </ul> </li> <li>♦ <b>Sustainable Forestry and Biodiversity Management -</b> <ul style="list-style-type: none"> <li>- Implementation of active forest regeneration programmes and determination of sustainable yields by forest type</li> <li>- Conduct regular (i.e. annual) third party review of performance against major planning processes (i.e. forest protection and regeneration, sustainable yields)</li> </ul> </li> <li>♦ <b>Water management -</b> protect / avoid water resources, minimisation and spill prevention, response planning, responsible waste vegetation management</li> <li>♦ <b>Forest fire management -</b> should include prevention,</li> </ul>

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Life Cycle Phase and Activity	Environment	
	Risks	Controls
	<ul style="list-style-type: none"> <li>◆ <b>Landscape scarring and visual impact</b> - clear felling</li> <li>◆ <b>Accidental/Unplanned Events</b> - inappropriate use of fire or unplanned fire events</li> </ul>	<ul style="list-style-type: none"> <li>◆ <b>Industry standards and best practice</b> - application of international standards and codes of practice for forest planning and harvesting</li> </ul>
<b>Transport</b>		
	<ul style="list-style-type: none"> <li>◆ <b>Strain on infrastructure and public nuisance</b> - Strain on local transport networks and infrastructure</li> <li>◆ <b>Habitat depletion, fragmentation and degradation</b> –                             <ul style="list-style-type: none"> <li>- Soil erosion</li> <li>- Access roads</li> <li>- Opening new areas for agricultural use leading to degradation and overuse</li> <li>- Disruption to wildlife migration routes,</li> <li>- Fragmentation of habitat and;</li> <li>- Loss of species due to increased traffic volume</li> </ul> </li> <li>◆ <b>Disruption to surface water (hydrological) and groundwater (hydrogeological) systems and flows</b> - fuel, lubricant and chemicals from use of heavy machinery</li> <li>◆ <b>Strain on infrastructure and public nuisance</b> - strain on local transport networks and infrastructure specifically harvesting and transport vehicles and effects on regional communities</li> </ul>	<ul style="list-style-type: none"> <li>◆ <b>Transport management</b> -                             <ul style="list-style-type: none"> <li>- Careful route selection plan access road routes carefully</li> <li>- Construct access roads so as to control drainage and minimise surface run-off</li> </ul> </li> <li>◆ <b>Rehabilitation/Restoration and Biodiversity Management</b> <ul style="list-style-type: none"> <li>- Establish reserved areas for natural regeneration and maintain and plant native species</li> <li>- Limit disturbance to other vegetation and landforms</li> </ul> </li> </ul>
<b>Processing</b>		
Wood Products	<ul style="list-style-type: none"> <li>◆ <b>Pressure on natural resources</b></li> </ul>	<ul style="list-style-type: none"> <li>◆ <b>Supply chain sustainability</b> -</li> </ul>

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Life Cycle Phase and Activity	Environment	
	Risks	Controls
	<ul style="list-style-type: none"> <li>- Supply contributing to destruction of high conservation value forests and primary forests</li> <li>- Unsustainable harvesting of forest resource</li> <li>♦ <b>Atmospheric emissions:</b> <ul style="list-style-type: none"> <li>- Dust, boiler and dryer emissions, onsite burning</li> <li>- Pollutants (VOC, NOX, SOX, PM10, CO, CO2, etc)</li> <li>- Greenhouse gas production</li> <li>- Odour and noise</li> </ul> </li> <li>♦ <b>Disruption and pollution to surface water (hydrological) systems and flows</b> - accidental spillage and storage leaks of timber treatment preservatives</li> <li>♦ <b>Disruption and pollution to groundwater (hydrogeological) systems and flows</b> - bulk chemicals, resins, adhesives and wood treatment agents accidental spillage or leakage from wastes</li> <li>♦ <b>Employee health and safety</b> - exposure to chemicals (known carcinogens), dust, noise and unguarded machinery</li> <li>♦ <b>Community health and safety</b> - transport accidents, emissions/discharges (aqueous and gaseous), noise, dust and vibrations vehicles and sawmills</li> <li>♦ <b>Accidental/unplanned fire</b> - flammable material and spark sources - e.g. ply board, chipboard waste / dust</li> </ul>	<ul style="list-style-type: none"> <li>- Third party confirmation of sustainable wood supply through implementation of internationally recognised process of chain of custody such as FSC or PEFC (preferably FSC as PEFC performance standard and chain of custody control mechanism is weak)</li> <li>♦ <b>Environmental management plans</b> - water quality management, spill prevention and response, air quality etc. and ensure that compliance is monitored</li> <li>♦ <b>Best Available Technique Not Entailing Excessive Cost (BATNEEC)</b> – e.g. install dust cyclones and filters, acoustic boards and sound barriers</li> <li>♦ <b>Hazardous waste, storage and disposal plans</b> - employ appropriate health and safety measures for containment of chemicals</li> <li>♦ <b>Waste management</b> - apply appropriate waste / waste water storage, and disposal management measures</li> <li>♦ <b>Fire management and training plans</b> - protection / prevention equipment e.g. Use protective clothing / equipment</li> </ul>
Pulp and Paper	<ul style="list-style-type: none"> <li>♦ <b>Pressure on natural resources</b> - <ul style="list-style-type: none"> <li>- Source and supply may contribute to destruction of high</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>♦ <b>Supply chain sustainability</b> <ul style="list-style-type: none"> <li>- Third party confirmation of sustainable wood supply</li> </ul> </li> </ul>

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Life Cycle Phase and Activity	Environment	
	Risks	Controls
	<p>conservation value forests and primary forests</p> <ul style="list-style-type: none"> <li>- Reliance on non-sustainable harvesting of forest resource</li> </ul> <p>Potentially high water and energy resource consumption</p> <ul style="list-style-type: none"> <li>♦ <b>Atmospheric emissions:</b> <ul style="list-style-type: none"> <li>- Gaseous emissions from boilers and acid gases, and fugitive chip dust generated from chip handling and stacking operations</li> <li>- Pollutants (VOC, NOX, SOX, PM10, CO, CO2, etc)</li> <li>- Greenhouse gas production</li> <li>- Dust and noise</li> </ul> </li> <li>♦ <b>Odour</b> - highly noxious sulphide containing compounds</li> <li>♦ <b>Disruption and pollution of surface water (hydrological) systems and flows</b> - liquid bleaching effluents and wastewater containing organic matter, suspended solids, dioxin by-products and dissolved salts</li> <li>♦ <b>Disruption and pollution of groundwater (hydrogeological) systems and flows</b> - accidental spillage, leakage from waste of bulk chemicals e.g. caustic soda, biocides and sodium hypochlorite</li> </ul>	<p>through implementation of internationally recognised process of chain of custody such as FSC and PEFC</p> <ul style="list-style-type: none"> <li>- All sponsor developed Environmental Impact Statements are reviewed by independent third party reviewer</li> </ul> <ul style="list-style-type: none"> <li>♦ <b>Environmental management plans</b> - <ul style="list-style-type: none"> <li>- Water quality management, spill prevention and response, air quality etc. and ensure that compliance is monitored</li> <li>- Odour elimination / containment processes</li> </ul> </li> <li>♦ <b>Hazardous waste, storage and disposal plans</b> - employ appropriate health and safety measures for containment of chemicals</li> <li>♦ <b>Use Best Available Technique Not Entailing Excessive Cost (BATNEEC)</b> - wastewater treatment design</li> <li>♦ <b>Waste management</b> - apply appropriate waste / waste water storage, disposal management measures</li> <li>♦ <b>Fire management and training plans</b> - protection / prevention equipment e.g. Use protective clothing / equipment</li> </ul>
Printing and Publishing	<ul style="list-style-type: none"> <li>♦ <b>Pressure on natural resources</b> - <ul style="list-style-type: none"> <li>- Contributing to destruction of high conservation value forests</li> <li>- Reliance on non-sustainable harvesting of forest resource</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>♦ <b>Supply chain sustainability</b> - <ul style="list-style-type: none"> <li>- Third party confirmation of sustainable wood supply through implementation of internationally recognised process of chain of custody such as FSC and PEFC</li> <li>- All sponsor developed Environmental Impact Statements</li> </ul> </li> </ul>



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Life Cycle Phase and Activity	Environment	
	Risks	Controls
	<ul style="list-style-type: none"> <li>♦ <b>Atmospheric emissions:</b> - solvent emissions from solvent based inks               <ul style="list-style-type: none"> <li>- Pollutants (VOC, NOX, SOX, PM10, CO, CO2, etc)</li> <li>- Greenhouse gas production</li> <li>- Dust and noise</li> </ul> </li> <li>♦ <b>Disruption and pollution of groundwater (hydrogeological) systems and flows</b> - accidental spillage, leakage from waste of bulk chemicals e.g. solvents and oils</li> <li>♦ <b>Accidental/unplanned events</b> - Explosion and fire due to heat of production equipment</li> <li>♦ <b>Liquid waste (production and disposal) and disruption to surface water (hydrological) systems and flows</b> - contamination from wastewater discharge</li> </ul>	<p>are reviewed by independent third party reviewer</p> <ul style="list-style-type: none"> <li>♦ <b>Environmental management plans</b> -               <ul style="list-style-type: none"> <li>- Govern water quality, spill prevention and response, air quality etc. and that compliance is monitored</li> <li>- Use of water based inks to eliminate solvent emissions</li> </ul> </li> <li>♦ <b>Waste management</b> - apply appropriate waste / waste water storage, disposal management measures</li> <li>♦ <b>Fire management and training</b> - protection / prevention equipment e.g. Use protective clothing / equipment</li> </ul>

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## Social Risks

Life Cycle Phase and Activity	Social	
	Risks	Controls
<b>Propagation and Harvesting</b>		
Felling etc.	<ul style="list-style-type: none"> <li>♦ <b>Pressure on natural resources</b> -               <ul style="list-style-type: none"> <li>- Illegal log and timber supplies entering supply chain</li> <li>- Destruction of high conservation value forests</li> <li>- Non-sustainable harvesting of forest resource</li> </ul> </li> <li>♦ <b>Land acquisition - displacement</b> - loss of land leading to poverty, social disruption, migration, involuntary resettlement requiring relocation and compensation claims</li> <li>♦ <b>Community health and safety</b> – noise, vibration, dust creation, transport movement and road safety, emissions and air quality from vehicles, harvesting plant and equipment</li> <li>♦ <b>Communicable diseases</b> - spread of diseases to local / foreign populations from foreign/migrant work populations</li> <li>♦ <b>Cultural / Archaeological Heritage</b> - Damage/ destruction of cultural/ historical/ archaeological/ religious sites</li> <li>♦ <b>Loss of livelihood</b> - economic displacement - job competition, esp. people without formal land title, conflict between locals and outsiders</li> <li>♦ <b>Disruption of social / community cohesion and exclusion of vulnerable groups</b> <ul style="list-style-type: none"> <li>- Breakdown of social networks and structures</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>♦ <b>Supply chain sustainability</b> -               <ul style="list-style-type: none"> <li>- Third party confirmation of sustainable wood supply through implementation of internationally recognised process of chain of custody such as FSC and PEFC</li> <li>- All sponsor developed Environmental Impact Statements are reviewed by independent third party reviewer</li> </ul> </li> <li>♦ <b>Resettlement and relocation management</b> - proper compensation, restoration of livelihoods and living standards</li> <li>♦ <b>Community relations management</b> - management of interface between local communities and outsiders through stakeholder identification and consultation (including governmental/national/regional/local stakeholders).</li> <li>♦ <b>Community safety management</b> - establishment of safety buffer zone around felling operations</li> <li>♦ <b>Cultural heritage / archaeology management</b> - protection of cultural / archaeological sites in accordance with country's laws/international standards and conventions</li> <li>♦ <b>Social / community baseline assessment</b> - establish community profiles (e.g. livelihoods and employment) in project area, through detailed social baseline assessments to inform mitigation measures and the development of long term agreed community investment/development</li> </ul>

# Forestry and Logging

Life Cycle Phase and Activity	Social	
	Risks	Controls
	<ul style="list-style-type: none"> <li>- Socio-economic exclusion of ethnic minorities and indigenous peoples</li> <li>- Socio-cultural tensions between local and foreign workforce from influx and outflow of migrants/ temporary workers and attraction of seasonal residents to project area</li> </ul>	
<b>Transport</b>		
Access roads	<ul style="list-style-type: none"> <li>♦ <b>Community health and safety</b> – noise, vibration, dust creation, traffic movement and road safety, emissions and air quality;</li> <li>♦ <b>Cultural / archaeological heritage</b> - Damage/ destruction of cultural/ historical/ archaeological/ religious sites</li> <li>♦ <b>Land acquisition - displacement</b> – resettlement/relocation (including squatters) because of right-of-way acquisitions and loss of traditional lands / cultural property</li> <li>♦ <b>Loss of livelihood - economic displacement</b> - esp. income and land depreciation</li> <li>♦ <b>Community health and safety</b> - water source contamination from surface runoff from roads and soil runoff from bare lands resulting from earthmoving activities</li> <li>♦ <b>Land acquisition - loss of access</b> - opening up of natural habitats to human access/settlement - impact on protected conservation</li> </ul>	<ul style="list-style-type: none"> <li>♦ <b>Community relations management</b> - management of interface between local communities and outsiders through stakeholder identification and consultation (including governmental/national/regional/local stakeholders)</li> <li>♦ <b>Cultural heritage / archaeology management</b> - protection of cultural / archaeological sites in accordance with country's laws/international standards and conventions</li> <li>♦ <b>Transport management plans</b> - appropriate driving training and road safety awareness in communities</li> <li>♦ <b>Resettlement and relocation management</b> – proper compensation, restoration of livelihoods and living standards</li> <li>♦ <b>Community health and safety plans</b> - vaccinations and awareness raising on communicable diseases</li> </ul>

# Forestry and Logging

Life Cycle Phase and Activity	Social	
	Risks	Controls
	<ul style="list-style-type: none"> <li>♦ <b>Strain on infrastructure and public nuisance</b> <ul style="list-style-type: none"> <li>- Strain on transport networks and local infrastructure</li> <li>- Infrastructural impacts (e.g. access roads - opening new areas for agricultural use leading to degradation and overuse)</li> <li>- Large vehicle traffic impede the movement of inhabitants</li> </ul> </li> <li>♦ <b>Communicable diseases</b> - spread of communicable diseases, e.g. STDs and HIV/AIDS, amongst workers and local community</li> </ul>	
<b>Processing and Production</b>		
Pulp and Paper Printing and Publishing Wood Processing	<ul style="list-style-type: none"> <li>♦ <b>Pressure on natural resources</b> - <ul style="list-style-type: none"> <li>- Illegal log and timber supplies entering supply chain</li> <li>- Destruction of high conservation value forests</li> <li>- Non-sustainable harvesting of forest resource</li> <li>- Lack of long term secure sustainable timber supply (given pulp and paper mill investments require minimum of 15-20 years confirmed supply)</li> </ul> </li> <li>♦ <b>Community health and safety</b> – noise, vibration, odour, traffic movement, emissions and air quality</li> <li>♦ <b>Stakeholder/public consultation and disclosure</b> – social conflict and unrest due to operations and inadequate information disclosure and explanation of project impacts</li> <li>♦ <b>Communicable diseases</b> - spread of diseases to local /</li> </ul>	<ul style="list-style-type: none"> <li>♦ <b>Supply chain sustainability</b> <ul style="list-style-type: none"> <li>- Third party confirmation of legal and sustainable wood supply through implementation of internationally recognised process of chain of custody particularly in large scale pulp and paper operations</li> </ul> </li> <li>♦ <b>Community/stakeholder relations management</b> <ul style="list-style-type: none"> <li>- Management of interface between local communities and outsiders/foreign workers as well as community tensions, grievances and concerns through stakeholder identification and consultation and information dissemination about the project (including governmental/national/regional/local stakeholders)</li> <li>- Management of relations with NGO and national advocacy</li> </ul> </li> </ul>

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Life Cycle Phase and Activity	Social	
	Risks	Controls
	<p>foreign populations</p> <ul style="list-style-type: none"> <li>♦ <b>Land acquisition – displacement</b> - Loss of access               <ul style="list-style-type: none"> <li>- Land acquisition (temporary and / or permanent) and resettlement - disruption to family/community hierarchy / assets</li> <li>- Inadequate or inappropriate land rehabilitation and restoration</li> </ul> </li> <li>♦ <b>Employee health and safety</b> - employment and labour standards Employment and poor labour standards, child labour and Employee health and safety</li> <li>♦ <b>Disruption of social / community cohesion and exclusion of vulnerable groups</b> <ul style="list-style-type: none"> <li>- Breakdown of social networks and structures</li> <li>- Socio-economic exclusion of ethnic minorities and indigenous peoples</li> <li>- Socio-cultural tensions between local and foreign workforce from influx and outflow of migrants/ temporary workers and attraction of seasonal residents to project area</li> </ul> </li> <li>♦ <b>Cultural / archaeological heritage</b> – damage to / destruction of cultural / archaeological sites / features</li> <li>♦ <b>Host country governance, national economy and revenue transparency</b> - local procurement and business, unregulated trade, sustainable economic growth, inflation,</li> </ul>	<p>groups through consultation</p> <ul style="list-style-type: none"> <li>♦ <b>Social / community baseline assessment</b> - detailed social baseline assessments to establish community profiles (e.g. social hierarchy, ethnic groups, socio-cultural and religious practices, skills profile) and public services / resources in a project area</li> <li>♦ <b>Community investment and development</b> - community investment (both long and short term) - health care facilities, micro-finance initiatives</li> <li>♦ <b>Site security plans</b> - ensure appropriate security measures and awareness raising are in place</li> <li>♦ <b>Community health and safety plans</b> - vaccinations and awareness raising on communicable diseases</li> <li>♦ <b>Human resource policies</b> - maximization of local employment</li> <li>♦ <b>Cultural heritage / archaeology management</b> -               <ul style="list-style-type: none"> <li>- Identification, classification and protection of cultural / archaeological sites in accordance with the country's laws/international standards and convention</li> <li>- Implement “watching brief” during construction activities</li> </ul> </li> <li>♦ <b>Partnering and supporting host Governments</b> -               <ul style="list-style-type: none"> <li>- Encourage revenue transparency and good governance</li> <li>- Compliance with national / regional / local regulations</li> </ul> </li> </ul>

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Life Cycle Phase and Activity	Social	
	Risks	Controls
	<p>bribery, corruption and extortion</p> <ul style="list-style-type: none"> <li>♦ <b>Strain on infrastructure and public nuisance</b> <ul style="list-style-type: none"> <li>- Strain on transport networks drain on and overuse of local infrastructure</li> <li>- Capacity to absorb new / foreign populations (supply and demand)</li> <li>- Water resources, power, health, education, housing</li> </ul> </li> <li>♦ <b>Loss of livelihood (income and employment)</b> - economic displacement at closure- dependency on project related jobs</li> </ul>	<ul style="list-style-type: none"> <li>♦ <b>Resettlement and relocation management</b> - including measures for proper compensation, r estoration of livelihoods and living standards</li> </ul>

# Forestry and Logging

## Key Considerations

1. Are the high conservation value forests identified and protected as part of the harvest planning?
2. Does the company or organisation responsible for management of the timber resource have certification to Forest Stewardship Council (FSC) or Pan European Forest Certification (PEFC)?
3. Are contents of the project and the potential impacts adequately explained to the project affected population based on appropriate procedures, including information disclosure? Is understanding obtained from the public? Are proper responses made to comments from the public and regulatory authorities?
4. Can the supply of logs and timber be third party verified to come from legal and sustainable sources?
5. For large scale processing or production facilities, has the long term secure fibre supply been confirmed by an independent third party environmental and economic assessment?
6. Are indigenous communities impacted as part of the development?
7. Has the company ever been prosecuted for environmental offences?
8. Is the company required to hold consents from the environmental regulator or local authority? Are there current or future costs associated with complying with them?
9. Does the site or has the company ever land filled wastes on sites? (See Utilities and Waste Management Briefing Note)
10. In the harvesting or wood processing, are any nationally or internationally noted toxic chemical or hazardous substances going to be used?
11. For new sites or extensions to existing sites, has an Environmental Impact Assessment (ESIA) been undertaken to assess environmental impacts?
12. For large processing facilities, has the ESIA been assessed by an independent third party?

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## Regulation and Best Practice

Permits, consents and licences are likely to be required for forestry and logging operations the specifics of which will depend on the relevant regulatory framework in the location of the operation/facility. In developing regions, weaker governance structures may mean that there is less stringent implementation of local controls and regulations or indeed there may be no controls at all. In such cases the project proponent should ideally adopt international environmental and social standards and industry best practice.

In the case of almost all large-scale new build, expansion and development projects an Environmental and Social Impact Assessment (ESIA) will be required particularly where project debt financing is being sought. A comprehensive ESIA undertaken to international standards allows both the project sponsor and the investors to assess the full range of potential environmental and social impacts related to a project development, operation and decommissioning. Part of the ESIA process is to design appropriate mitigation measures and to set a framework for the monitoring the performance of these measures on a long-term basis. This limits and controls compliance and remediation costs as well as long term credit and reputation risks.

For smaller scale projects and operations a full ESIA may not be required. Focused studies on particular issues of concern may however, be helpful in identifying potential environmental and social risks associated with certain project activities.

The table below lists key international standards and publicly available best practice reference materials relevant to the forestry and logging industry.



# Forestry and Logging

Source	Agency / Body
Multilateral	<p>IFC Performance Standards  <a href="http://www.ifc.org/ifcext/enviro.nsf/Content/PerformanceStandards">http://www.ifc.org/ifcext/enviro.nsf/Content/PerformanceStandards</a></p> <p>World Bank Group Pollution Prevention and Abatement Handbook  <a href="http://Inweb18.worldbank.org/ESSD/envext.nsf/51ByDocName/PollutionPreventionandAbatementHandbook">http://Inweb18.worldbank.org/ESSD/envext.nsf/51ByDocName/PollutionPreventionandAbatementHandbook</a></p> <p>Global Environment Outlook Chapter 2 <i>The State of Our Environment</i>  <a href="http://www.unep.org/geo2000/english/0033.htm">http://www.unep.org/geo2000/english/0033.htm</a></p> <p>UNESCO Conference Second World Water Forum <i>Local and Indigenous Knowledge Systems</i>  <a href="http://portal.unesco.org/sc_nat/ev.php?URL_ID=3854&amp;URL_DO=DO_TOPIC&amp;URL_SECTION=201&amp;reload=1092045126">http://portal.unesco.org/sc_nat/ev.php?URL_ID=3854&amp;URL_DO=DO_TOPIC&amp;URL_SECTION=201&amp;reload=1092045126</a></p> <p>Summary of EU Legislation regarding Water Pollution  <a href="http://europa.eu/scadplus/leg/en/s15005.htm">http://europa.eu/scadplus/leg/en/s15005.htm</a></p> <p>Summary of EU Legislation regarding Air Pollution  <a href="http://europa.eu/scadplus/leg/en/s15004.htm">http://europa.eu/scadplus/leg/en/s15004.htm</a></p> <p>International Labour Organization (ILO) : Mandate  <a href="http://www.ilo.org/public/english/about/index.htm">http://www.ilo.org/public/english/about/index.htm</a></p> <p>ILO Lists of Subjects Standards have been decided upon  <a href="http://www.ilo.org/ilolex/english/subjectE.htm">http://www.ilo.org/ilolex/english/subjectE.htm</a></p> <p>Security Issues and Human Rights  <a href="http://www.voluntaryprinciples.org/principles/private.php">http://www.voluntaryprinciples.org/principles/private.php</a></p> <p>Roundtable on Sustainable Palm Oil  <a href="http://www.sustainable-palmoil.org/projects.htm">http://www.sustainable-palmoil.org/projects.htm</a></p> <p>Food and Agriculture Organization for the United Nations  <a href="http://www.fao.org/forestry/index.jsp">http://www.fao.org/forestry/index.jsp</a></p> <p>United Nations Economic Commission for Europe  <a href="http://www.unece.org/trade/timber/Welcome.html">http://www.unece.org/trade/timber/Welcome.html</a></p> <p>Annual Market Review of Timber Trade by UNECE and FAO  <a href="http://www.unece.org/trade/timber/tc-publ.htm">http://www.unece.org/trade/timber/tc-publ.htm</a></p> <p>World Business Council for Sustainable Development Forest Products Industry  <a href="http://www.wbcasd.org/templates/TemplateWBCSD5/layout.asp?type=p&amp;MenuId=Nzk&amp;doOpen=1&amp;ClickMenu=LeftMenu">http://www.wbcasd.org/templates/TemplateWBCSD5/layout.asp?type=p&amp;MenuId=Nzk&amp;doOpen=1&amp;ClickMenu=LeftMenu</a></p> <p>Forest Communicators Network (A committee of the UNECE Timber)  <a href="http://www.unece.org/trade/timber/pr/pr.htm">http://www.unece.org/trade/timber/pr/pr.htm</a></p>

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Source	Agency / Body
	<p>Asian Development Bank, 1994, <i>Handbook for Incorporation of Social Dimensions in Projects</i>, May.  <a href="http://www.adb.org/Documents/Handbooks/Social_Dimensions/default.asp">http://www.adb.org/Documents/Handbooks/Social_Dimensions/default.asp</a></p> <p>International Finance Corporation, 2002, <i>Handbook for Preparing a Resettlement Action Plan</i>, IFC Environment and Social Development Department, Washington, April.  <a href="http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/p_resettle/\$FILE/ResettlementHandbook.PDF">http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/p_resettle/\$FILE/ResettlementHandbook.PDF</a></p> <p>International Finance Corporation, 1998, <i>Doing better business through effective public consultation and disclosure: a good practice manual</i></p> <p>Japan Bank for International Cooperation, 2002, <i>JBIC Guidelines for Confirmation of Environmental and Social Considerations</i>, [Online, accessed 25 May 2006].  <a href="http://www.jbic.go.jp/english/environ/guide">http://www.jbic.go.jp/english/environ/guide</a></p>
Government	<p>Environment Agency UK Monitoring Guidance notes for emission levels  <a href="http://www.environment-agency.gov.uk/business/444217/444661/444671/466158/monitoring/?version=1&amp;lang=_e">http://www.environment-agency.gov.uk/business/444217/444661/444671/466158/monitoring/?version=1&amp;lang=_e</a></p> <p>Key areas to be consulted in with regards to Land Use  <a href="http://www.environment-agency.gov.uk/yourenv/consultations/782294/?version=1&amp;lang=_e">http://www.environment-agency.gov.uk/yourenv/consultations/782294/?version=1&amp;lang=_e</a></p> <p>Environment Agency UK Waste Disposal Legislation  <a href="http://www.environment-agency.gov.uk/subjects/waste/1032477/800036/?version=1&amp;lang=_e">http://www.environment-agency.gov.uk/subjects/waste/1032477/800036/?version=1&amp;lang=_e</a></p> <p>Health and Safety Executive Noise Regulations (complete)  <a href="http://www.hse.gov.uk/noise/regulations.htm">http://www.hse.gov.uk/noise/regulations.htm</a></p> <p>Health and Safety Executive Guidance for Employers for the Control of Noise at Work Regulations 2005  <a href="http://www.hse.gov.uk/pubns/indg362.pdf">http://www.hse.gov.uk/pubns/indg362.pdf</a></p> <p>Air Quality Criteria for Particulate Matter: Environmental Protection Agency United States Government  <a href="http://cfpub2.epa.gov/ncea/cfm/recorddisplay.cfm?deid=87903">http://cfpub2.epa.gov/ncea/cfm/recorddisplay.cfm?deid=87903</a></p> <p>Environment Canada Convention on Biological Diversity  <a href="http://www.ec.gc.ca/international/multilat/biodiv_e.htm - act">http://www.ec.gc.ca/international/multilat/biodiv_e.htm - act</a></p> <p>Health Canada Guidelines on Noise in the Workplace  <a href="http://www.hc-sc.gc.ca/ewh-semt/pubs/noise-bruit/insider7/index_e.html">http://www.hc-sc.gc.ca/ewh-semt/pubs/noise-bruit/insider7/index_e.html</a></p> <p>Traffic Noise Information and Recommendations  <a href="http://www.hc-sc.gc.ca/ewh-semt/pubs/noise-bruit/insider8/index_e.html">http://www.hc-sc.gc.ca/ewh-semt/pubs/noise-bruit/insider8/index_e.html</a></p> <p>Canada Labour Code Federal Law and Regulations  <a href="http://www.hrsdc.gc.ca/asp/gateway.asp?hr=/en/lp/lo/fll/part2/index-fll.shtml&amp;hs=oxs">http://www.hrsdc.gc.ca/asp/gateway.asp?hr=/en/lp/lo/fll/part2/index-fll.shtml&amp;hs=oxs</a></p>

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Source	Agency / Body
Industry Association	Forest Stewardship Council <a href="http://www.fsc.org/en/about/policy_standards">http://www.fsc.org/en/about/policy_standards</a> Sustainable Forestry Initiative <a href="http://www.aboutsfi.org/about.asp">http://www.aboutsfi.org/about.asp</a> Pan European Forest Certification <a href="http://www.pefc.org/">http://www.pefc.org/</a>