Environmental and Social Management System Arrangement

November 2016

Sri Lanka: Small and Medium-Sized Enterprises Line of Credit Project

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NATIONAL DEVELOPMENT BANK PLC

ENVIRONMENTAL & SOCIAL MANAGEMENT MANUAL

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NATIONAL DEVELOPMENT BANK PLC

ENVIRONMENTAL & SOCIAL MANAGEMENT MANUAL

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NATIONAL DEVELOPMENT BANK PLC

ENVIRONMENTAL & SOCIAL MANAGEMENT MANUAL

1. Introduction

1.1. This Environmental and Social Management Manual (E & S Management Manual) sets out the detailed procedure for implementation of Environmental and Social Management System (ESMS) and the guidelines and procedure set out in Environmental and Social Management Framework (E & S Management Framework). The users of this manual are advised to read the E & S Management Framework for better understanding and implementation of ESMS.

2. Environmental and Social Management System (ESMS)

(i) Description

2.1. The Environmental and Social Management System (ESMS) in NDB bank envisages, identifying Environmental & Social risks (E & S risks) and impacts of the projects it finances and mitigating such risks at a very early stage of the credit evaluation. This system is an integral part of the Credit Policy and Credit Evaluation Process of financing projects of NDB bank.

(ii) Scope

2.2. The scope of ESMS is as follows.

- ESMS is applicable to the Project Finance and Emerging Corporates divisions in the Corporate Banking Group of the Bank.
- In addition, the system is applicable only to the proposals evaluated by the said divisions from June 1, 2008.
- The system is applicable to projects in all sectors.
- Performance Standards on Environmental and Social Sustainability published on IFC website as of January 1, 2012 will be treated as part of this ESMS manual

3. Environmental and Social Management Team (E & S Team)

3.1. In order to implement the system, NDB bank could either have a separate functional unit or a cross-departmental team. The latter option best suits NDB bank. Presently, the ESMS is designed and implemented by a cross departmental team, constituting of personnel from Corporate Banking and Emerging Corporates (SME) Divisions.

3.2. The functions of the E & S Team are as follows.

- Planning for the implementation of ESMS
- Implementation of ESMS
- Developing the monitoring / reviewing mechanisms
- Training
- Generating routine / adhoc reports to the senior management / other external organizations as and when required
- Review and improve the system as and when required

3.3. This team consists of following personnel presently holding the following positions.

Position	Name	Designation
E & S Manager	Delrene Seneviratne	VP - Administration & Services
E & S Coordinator	Sharon De Silva	Senior Manager - Corporate Sustainability
E & S Champion - (Project Finance)	Nilanthi De Silva	Senior Manager - Project Finance Division II
E & S Champion - (SME)	Regional Managers	Regional Managers
E & S Champion - (Technical)	Supun Perera	Relationship Manager - Corporate Banking

4. Exclusion List

4.1. The Exclusion List of the Bank is set out in Annex I. This Exclusion List consists of certain activities and /or industries, which the Bank is refrained from funding and is applicable for all products and services irrespective of the department, in respect of all new approvals.

5. Significant Sectors

5.1. ESMS is presently applicable to all sectors.

6. E & S Risk Categories

6.1. A risk categorization criteria ranging from A to C will be used to categorize the risk levels of the proposed projects. Sector specific studies are given in Annex III. Detailed guideline for the Risk Categories is given in Annex IV.

7. Process for Environmental & Social Assessment

7.1. When a project is proposed for financing, NDB bank will conduct an Environmental and Social Assessment of the project as part of its overall due diligence. The said Environmental and Social Assessment will consider in an integrated manner, the potential environmental and social (including labour, health, and safety) risks and impacts of such risks on the project. The assessment process will be based on current information available.

7.2. Risks and impacts will be analysed in the context of the project's area of influence, ***in a manner appropriate to the nature and the scale of the project***. This area of influence encompasses, as appropriate: (in addition to the project direct activities / processes of the proposed project and the people involved in the processes)

(i) The primary project site(s) and related facilities that the client (including its contractors) develops or controls, such as power transmission corridors, pipelines, canals, tunnels, relocation and access roads, borrow and disposal areas, construction camps

(ii) Associated facilities that are not funded as part of the project (funding may be provided separately by the client or by third parties including the government), and whose viability and existence depend exclusively on the project and whose goods or services are essential for the successful operation of the project

(iii) Areas potentially impacted by cumulative impacts from further planned development of the project, any existing project or condition, and other project-related developments that are realistically defined at the time the Environmental and Social Assessment is undertaken

(iv) Areas potentially affected by impacts from unplanned but predictable developments caused by the project that may occur later or at a different location. The area of influence does not include potential impacts that would occur without the project or independently of the project.

* Applicability of (ii), (iii) and (iv) above shall be only for the projects categorised under Risk Category A (set out in section 6.1 and Annex IV herein).

7.3. Detailed process of the Environmental & Social Assessment to be followed is given below.

(i) Check Lists

- Relationship Managers, when evaluating a new proposal, will fill in the specific Environmental and Social Checklist, preferably at an early stage of the project (respective check lists are given in Annex II). This will be done in consultation with the client.
- Relationship Managers to evaluate the proposal based on IFC Performance Standards.

(ii) Excel Tool

- Based on the information emanating from the checklist, the Relationship Managers will fill in the Excel Tool which would generate the Risk Category. Relationship Managers should use this to mitigate subjectivity.

(iii) Risk Categorization

- Based on the information emanating from the checklist and the Excel Tool, the Relationship Manager shall identify and recommend the Risk Category of the project.
- The respective Relationship Manager will then discuss the completed checklist with the Business Unit Head. The said checklist shall be forwarded to the following authority levels for comments and approval.

Risk Category	Recommended By	Approved By
A	Relationship Manager	Respective E & S Champion Business Unit Head
B	Relationship Manager Business Unit Head	Respective E & S Champion
C	Relationship Manager	Business Unit Head *

* Check lists of projects categorised as "C" shall be sent to respective E & S Champion for comments if any.

- Irrespective of whether the checklist has been forwarded to the respective authority level or not, the checklist shall be filed in the Post Appraisal file, once the facility is approved, for future references.

- Any member from the E & S Team shall have access to the said checklist at any given time.

(iv) Initial Environmental Examination (IEE) / Environmental Impact Assessment (EIA)

- As and when IEE / EIA is carried out, the scope, content, public consultation and information disclosure of IEE / EIA will be in accordance with the requirements of Asian Development Bank (ADB), IFC and Central Environmental Authority of Sri Lanka.

(v) Mitigatory Action plan

- Business unit representatives jointly with the respective E & S Team representative/s (as specified in the table given in 7.3 (ii) above) shall identify specific mitigatory measures and actions necessary for the project to comply with applicable laws and regulations and to meet the requirements of NDB bank and then shall proceed to prepare the action plan.

- The Action Plan may range from a brief description of routine mitigatory measures to a series of specific plans. Preparation of the action plan will be done at the time of approving the risk category.

- In addition, the terms & conditions to be incorporated in the contract, in order to monitor the fulfilment of the said mitigatory measures, shall also be identified and decided upon, at this point.

- The Action Plan will:
  (a) Describe the actions necessary to implement the various sets of mitigatory measures or corrective actions to be undertaken
  (b) Prioritise these actions
  (c) Include the time-line for their implementation
  (d) Describe the schedule and mechanism for external reporting to be done by the client, on the client's implementation of the Action Plan.

- The final recommendations / mitigatory actions shall be included in the project appraisal report for the improvement of the proposition by
  - Mitigating the E & S risks and / or
  - Avoiding E & S risks and /or
- Measures to compensate the risk that Bank may be taking on the project.

- Emissions Standards when specified as part of Mitigatory Action plan, such standards will be in accordance with the IFC EHS Guidelines as prescribed in ADB's Environment Policy and those of Central Environmental Authority of Sri Lanka.

8. Process for Environmental & Social Management

8.1. The process for Environmental & Social Management includes the following.

(i) Incorporate Covenants / Terms & Conditions in to the Legal Contract

- Based on the Mitigatory Action plan (referred to in section 7.3 (iv) above), Business Units shall ensure that the mitigatory actions shall be appropriately covered in the loan agreement. These covenants / Terms & Conditions may include the following.
  - Necessary Terms and Conditions, clauses to be incorporated in the Legal Contact
  - Conditions to be fulfilled prior to disbursements
  - Conditions to be fulfilled on best efforts basis
  - Status reports to be submitted to the bank by the project proponent / sponsor and the time framework for such reports (Status reports could be at various time intervals or at various milestones of the project)

- In respect of projects of "Category A", the Relationship Manager should send a copy of the appraisal report and the legal contract to E & S Coordinator and E & S Manager for record and monitoring purposes.

- The proposed terms and conditions to be added in legal documents are attached in Annex V.

(ii) Draw up the project specific Monitoring Mechanism

- Respective authorities mentioned in 7.3(ii) above as the case may be shall, jointly with the Business Unit will draw up a monitoring mechanism to ensure the compliance to the stipulated terms and conditions. This could be done at the same time when the mitigatory actions and legal covenants / terms & conditions are decided upon or subsequently, but prior to the approval of the facility.

8.2. Action Plan following IFC Performance Standards

a) IFC performance standards to be followed as per the steps given below;

(i) at the time of the appraisal NDB to evaluate the client's ability in complying with international standards based on the capacity of the client and magnitude of the project

(ii) if the client's capacity is adequate to comply with international standards, NDB to examine whether they already comply with IFC PSs. If the client does not comply with PSs, NDB to enter into an agreement with the client on a reasonable time period for the client to complying with PSs &

(iii) NDB to prepare a corrective action plan jointly with the client for the agreed time period and include risks of the project adherence to the IFC PS in the terms and conditions of the loan agreement

b) The eight performance standards are listed in Annex VI.

9. Monitoring

9.1. Monitoring of the ESMS will be at three levels

(i) Monitoring by the Business Units

Once the above-mentioned covenants / terms and conditions are incorporated in to the legal contract, Business Units are expected to monitor the fulfilment of / compliance to the said conditions as the project progresses.

(ii) Monitoring by the ESMS Team

Independent to the monitoring by the Business Units, in respect of "Category A" by E & S Coordinator and in respect of "Category B" by the respective E & S champion, also will monitor the fulfilment of/ compliance to the terms and conditions stipulated and with the monitoring mechanism stipulated in para 8.1 (ii) above.

(iii) Visits

Frequency of the visits to be made to project sites of Category B shall be decided by the respective E & S Champion jointly with the Business Unit. "Category A" projects shall be visited once during the implementation period and every year thereafter, by the E & S Champion – (Technical).

(iv) E & S Reviews

In addition, the respective Relationship Manager shall carry out an annual E & S review with respect to "Category A" projects and forward the same to E & S Coordinator through the Business Unit Head. In respect of "Category B" project where the facilities require an annual review as per Bank's Credit Policy, a separate section should be included in the annual review covering E & S aspects.

(v) Revising the Risk Category

Risk category originally identified may be revised upward or downward subsequently while the project implementation is progressing. Revision of the risk category will also be done under the same authority level given above. The extent to which the environmental and social covenants / terms and conditions proposed originally and any new risks emerged subsequently will be taken in to consideration when revising the risk category. Such changes shall be reported to the E & S Coordinator in respect of a change from Risk Category B to C and to the E & S Manager in respect of a change of Risk Category A to B/C.

10. Reporting

10.1. Detailed Reporting requirements of the ESMS will be in the following form.

(i) Reporting by the client

NDB bank will require the clients of projects classified as Risk "Category A" to prepare periodic monitoring reports on its Environmental and Social performance and forward to the Bank as agreed / specified in the contract.

(ii) Reporting by the Business Units

The Business Units are expected to provide to the E & S Coordinator in respect of "Category A" projects and to respective E & S Champion in respect of "Category B" projects, with periodic status reports at pre-identified milestones if previously identified of each of the project. (Format for such status reports are given in Annex VII)

(iii) Reporting by the ESMS Team

E & S Coordinator shall report to E & S Manager, on the non-compliance / non-fulfilment of the above said terms and condition on a quarterly basis. (The format for such reporting is given in Annex VIII)

E & S Manager shall take appropriate remedial action on case-by-case basis. Depending on the seriousness of the violations, he shall report the same to the Risk Department or the Internal Credit Committee/s as the case may be.

11. Exceptions the E & S Management Manual

11.1. Any exception to this manual shall be done only after obtaining approval from the respective Credit Committee/s

12. Violations

12.1. Any member of E & S Team shall report any violation of the rules and procedures set out in this manual to the E & S Manager.

13. Training

13.1. Training is to be carried out at two levels, namely training the ESMS Team members and training the staff in Business Units.

(i) Training ESMS Team will be in the following areas.

- The designing ESMS
- Implementing ESMS in the Bank
- Reviewing and Improving ESMS

(ii) Training staff in operational units will be primarily to provide direction and the guidance in evaluating the E & S risks of a project. In addition, training on new development in relation to E & S aspects including emerging types of risks and mitigatory actions, developing trends in E & S matters and industry best practices shall also be provided as and when necessary.

Training of the ESMS Team and the Relationship Managers will be an ongoing project.

14. Access to the E & S Management Manual

14.1. Copies of this document shall be made available with Heads of Business Units of Project Finance and Emerging Corporates Division. In addition, an electronic version of the same, shall also be made available in a common drive in NDB's server for easy access.

ANNEX I

Exclusion List

I. Production or activities involving forced labour1 or child labour2.
II. Production of or trade in any product or activity deemed illegal under host country legislation or regulations or international conventions and agreements.
III. Production of or trade in weapons and ammunitions 3.
IV. Trade in wildlife or wildlife products regulated under CITES4.
V. (Production or use of or trade in hazardous materials such as radioactive materials[5], unbounded asbestos fibers, products containing PCBs[6] and chemicals subject to international phase-outs or bans. (Any further additions shall be recommended later for Internal Credit Committee approval).
VI. Commercial logging operations or the purchase of logging equipment for use in any primary forest or forest areas with a high biodiversity value, or any other activities that lead to substantial clear cutting of such forests7.
VII. Production of or trade in pharmaceuticals subject to international phase-outs or bans.
VIII. Production of or trade in pesticides/herbicides subject to international phase-outs or bans.
IX. Production of or trade in ozone depleting substances subject to international phase-out8.
X. Drift net fishing in the marine environment using nets in excess of 2.5 km in length.
XI. Gambling, casinos and equivalent enterprises
XII. Production or trade in alcoholic beverages (excluding Beer and Wine) 9
XIII. Production or trade in tobacco10.

[1] Forced labour means any work or service, not voluntarily performed that is extracted from an individual under threat of force or penalty.
[2] Employees may only be taken on who are aged 15 or older, unless local legislation specifies a higher age for compulsory school attendance or as the minimum age for working. In such cases the higher age shall apply.
[3] This does apply to clients who are substantially involved in these activities. "Not substantially involved" means that the activity concerned is ancillary to a project sponsor's primary operations
[4] CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora.
[5] This does not apply to the purchase of medical equipment, quality control (measurement) equipment and any equipment where NDB considers the radioactive source to be trivial and/or adequately shielded.
[6] PCBs: Polychlorinated biphenyls, a group of highly toxic chemicals. PCBs are likely to be found in oil-filled electrical transformers, capacitors and switchgear dating from 1950-1985.
[7] "Substantial" refers to any degree of deforestation, which leads to the disappearance of the essential functionalities of the forest, though surface reduction under a critical minimum. With "essential functionalities" defined as carrying capacity for biodiversity, watershed management, erosion control and indigenous inhabitation.
[8] Ozone Depleting Substances: Chemical compounds, which react with and delete stratospheric ozone, resulting in "holes in the ozone layer". The Montreal Protocol lists ODS's and their target reduction and phase-out dates.
[9] NDB's exposure to alcoholic beverages (excluding Beer & Wine) Tobacco and Coal to be capped at 2% of the total portfolio without excluding entirely.
[10] NDB's exposure to alcoholic beverages (excluding Beer & Wine) Tobacco and Coal to be capped at 2% of the total portfolio without excluding entirely.

ANNEX II

CHECK LISTS

Part i

Environmental and Social Questionnaire (category A projects)

SECTION A:

COMPANY AND PROJECT FACT SHEET

CONTACT DETAILS				
Company (incl. site details if different):	Name / Address/ Position:	Phone Number:	Fax Number:	Website/ home page:
Executive board member with responsibilities for environment and social issues:		T-Ext.:	F-Ext.:	e-mail:
Environmental & social contact person:		T-Ext.:	F-Ext.:	e-mail:

ENVIRONMENTAL AND SOCIAL ASSESSMENT

A 1. PROJECT INFORMATION

A 1.1 Details of Company activities;	Please provide a description of Company activities (with specific reference to the funding / investment request). Include information on location(s), history of operations, whether funding is sought for development of new site/ modernisation of existing site, construction schedule etc. Provide location plans and maps if necessary:
A 1.2 Details of operational process:	Please provide a description of operational processes including raw material / inputs, technologies and outputs, details of energy and water needs and supplies (for water please provide details on source – municipal, groundwater etc – and volumes used/month), production capacities, by products and waste products etc. Provide flow diagrams and other figures as necessary:

Land, Site and Setting Information

A 1.3 Will the Company **acquire any land** as a result of the loan /investment? If so please describe (providing details of location, size, current land use lease and purchase date and arrangements): ☐ Yes ☐ No

A 1.4 Is there potential for **contamination** of the Company's site(s) from past or present activities? If yes please provide details: ☐ Yes ☐ No

A.1.5 Specifically in respect of the proposed loan/ investment, please provide information on the Company's activities and locations in relation to local towns/ villages, industrial estates, **environmentally or socially sensitive areas** etc. Use the table below if it is helpful:

Site information:

Are Company activities located within, or in the vicinity of (2.5 km radius) any of the following (more than one may be selected)?		
	Company site located in:	Site in the vicinity of:
☐ Industrial areas		
☐ Free trade zones or special economic zones		
☐ Residential areas (villages/housing, shops)		
☐ Agricultural areas		
☐ Water bodies (such as wetlands, lakes, rivers)		

☐ Significant cultural property (e.g. sites of archaeological, geological, historical or religious interest)	.....	.....
☐ Natural habitats (e.g. forests, savannah, swamp, mangrove, coral reefs)	.....	.....

A 2. LABOR ISSUES

Employment

A 2.1 Current number of employed people	Total: (.....)	Permanent Workers: Females: ..... Males:	Temporary Workers: Females: ..... Males: ..... Seasonal ..... Migrants .....
Jobs that will be created	Total: (.....)	Females: ..... Males:	Females: ..... Males: .....
Subcontracted jobs	Total: (.....)	Females: ..... Males:	Females: ..... Males: .....
Number of subcontractors :		Type of sub-contracted work :	

A 2.2 Does the project offer a significant number of **females access to permanent jobs in the formal sector**? ☐ Yes ☐ No
If yes, please specify the number of jobs:

Basic Terms and Conditions of Employment

A 2.3 Please provide details of the Company's monthly **minimum wage** (based on the standard working week as defined by law, excluding any overtime): ..... /month ..... hours /week

A 2.4 Please provide details (if known) of the average monthly minimum wage for the sector and geographical location: ..... /month

A 2.5 Does the Company run a **shift system**? If yes, please specify (numbers of shifts per day, hours per shift, shift sequence): ☐ Yes ☐ No

A 2.6 Does the Company provide any **additional benefits** or services to workers beyond statutory requirements (e.g. pension schemes, medical treatment, free meals, women empowerment programs, housing programs, childcare and education for children, transportation, insurance etc.)? If yes, please specify: ☐ Yes ☐ No

A 3. SUPPLY CHAIN AND CONTRACTORS

A 3.1 Please briefly describe **your supply chain** (e.g. what products and /or services are used and what relationships do you have with your suppliers – spot market purchases, small businesses/smallholders, home-workers, forward financing etc);

A 3.2 If the project involves **construction**, please describe the proposed construction period, work force, number of local /foreign workers, need for construction camps or accommodation etc.

A 4. COMMUNITY DEVELOPMENT IMPACTS

A 4.1 Does the Company undertake any **activities for local communities with positive impact** (e.g. improvement of local infrastructure, medical programmes, educational programmes etc.). If so, please describe: ☐ Yes ☐ No

A 4.2 Does the Company seek to **promote economic linkages with local communities** and business (e.g. through preferential sourcing of goods or supplies, through local recruitment and training etc)? If so please describe: ☐ Yes ☐ No

A 4.3 Have local communities or other stakeholders **expressed concerns** about the Company's activities in the past two years? If so please describe: ☐ Yes ☐ No

A 5. ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

A 5.1 Has the Company undertaken any environmental and / or social **impact assessments** for the project? If so please describe the assessment procedure and the conclusions. Attach approval permits if available and complete the table below: ☐ Yes ☐ No

Document	Prepared by / Date	Required by local/ national laws/regulation	Preparation underway
Environmental and / or social impact assessment?	..... /	☐ Yes ☐ No	☐ Yes, due .....
Environmental and / or social due diligence or audit report?	..... /	☐ Yes ☐ No	☐ Yes, due .....
Environmental and / or social monitoring report?	..... /	☐ Yes ☐ No	☐ Yes, due .....
Environmental and / or social management / action plan?	..... /	☐ Yes ☐ No	☐ Yes, due .....
Other documents (please specify)	..... /	☐ Yes ☐ No	☐ Yes, due .....

A 5.2 Does the company **report to regulators** on any environmental and social issues? If so please provide a brief description (what the company discloses, how often, to which authorities)**:** ☐ Yes ☐ No

A 6. ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEMS

A 6.1 Does the Company have an environmental or social **management system**[11]? If so, please describe:

SECTION B:

COMPANY COMPLIANCE STATEMENTS

In this section the client has to be asked to confirm compliance with environmental and social requirements on an aggregate level. If compliance cannot be clearly confirmed, please check "Not Confirmed", and provide further information. Please note, that non confirmation is not necessarily an indication of a misdemeanour.

B 1. COMPLIANCE WITH THE RELEVANT ENVIRONMENTAL AND SOCIAL GUIDELINES, LAWS AND REGULATIONS

B 1.1 Please confirm that the Company will fully comply with the relevant environmental and social national and local **laws and regulations**:	☐ Confirmed	☐ Not Confirmed
B 1.2 Please confirm that you have obtained all environmental and social/ labor **permits and approvals** necessary for the Company and that these are all valid:	☐ Confirmed	☐ Not Confirmed
B 1.3 Please confirm that, within the past two years, there have been **no objections** to the Company and / or project due to environmental or social factors or land issues (ownership, use):	☐ Confirmed	☐ Not Confirmed
B 1.4 Please confirm that you have **consulted with relevant stakeholders**[12] about the Company's activities in an appropriate manner and in accordance with local requirements:	☐ Confirmed	☐ Not Confirmed
B 1.5 Please confirm that the Company does not use or produce any products which are subject to **international ban or phase out** (such as PCBs or CFCs):	☐ Confirmed	☐ Not Confirmed

B 2. ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM

B 2.1 Please confirm that scope and significance of environmental, social, health and safety effects of the project have been fully adequately **assessed and evaluated**:	☐ Confirmed	☐ Not Confirmed
B 2.2 Please confirm that all environmental, social, health and safety issues (including fire safety, and emergency response plans) identified in the assessment are **adequately managed**:	☐ Confirmed	☐ Not Confirmed

B 3. LABOR AND WORKING CONDITIONS

[11] **Environmental management systems** define the organisational structure, planning activities, responsibilities, practices, procedures and resources for developing, implementing and maintaining compliance with environmental laws and standards, including systems such as **ISO 14001**.

[12] A Stakeholder is an individual or group which may be affected by a company's activities. It is often applied to local communities or groups who live near to a company's assets/ facilities, but also includes employees, investors, Non Governmental Organisations and other groups or individuals.

Occupational Health & Safety	
B 3.1 Please confirm that there have been no **fatalities,** serious injuries or major health risks (such as fires, explosions, sudden release of hazardous substances, traffic accidents, incidents involving evacuation) caused by or related to the Company within the last two years:	☐ Confirmed ☐ Not Confirmed
B 3.2 Please confirm that you have an **HIV / AIDS policy and program** in place, which especially targets the needs of your workers and employees:	☐ Confirmed ☐ Not Confirmed
B 3.3 Please confirm that you require all workers to wear **Personal Protective Equipment** (gloves, hard hats, respirators etc) when conditions require :	☐ Confirmed ☐ Not Confirmed
ILO Core Labor Standards	
B 3.4 Please confirm that no personnel under the age of 18 years is employed and that you have a robust **age verification system** in place:	☐ Confirmed ☐ Not Confirmed
B 3.5 Please confirm that work is carried out for the Company and its suppliers only **voluntarily** and not exacted from any individual under threat of force or penalty:	☐ Confirmed ☐ Not Confirmed
B 3.6 Please confirm that the Company does not **withhold deposits** or the original identity papers of workers for any reason:	☐ Confirmed ☐ Not Confirmed
B 3.7 Please confirm that the Company has a policy /regulations to **prevent workplace discrimination** (e.g. gender, ethnicity, political opinion, and religion, national or social origin) with regard to recruitment/promotion/access to training/benefits:	☐ Confirmed ☐ Not Confirmed
B 3.8 Please confirm that the Company does not **deduct wages** for disciplinary or any other reasons:	☐ Confirmed ☐ Not Confirmed
B 3.9 Please confirm that workers have the **right to organise** (e.g. in trade unions) and to be represented on decision making bodies at work and are free to attend meetings on decisions which affect them:	☐ Confirmed ☐ Not Confirmed
Basic Terms and Conditions of Employment (Wage, Working Hours, contracts etc.)	
B 3.10 Please confirm that the Company pays all workers (permanent and temporary) at more than the **local minimum wage**:	☐ Confirmed ☐ Not Confirmed
B 3.11 Please confirm that the Company provides all workers (permanent and temporary) with **legally required social securities and benefits** (health & unemployment insurances, pension, maternity leave etc.):	☐ Confirmed ☐ Not Confirmed
B 3.12 Please confirm that daily work time including overtime does not exceed **12 hours** for more than a maximum three months per year:	☐ Confirmed ☐ Not Confirmed
B 3.13 Please confirm that **overtime i**s paid at premium rate:	☐ Confirmed ☐ Not Confirmed
B 3.14 Please confirm that workers have **one day off** per week:	☐ Confirmed ☐ Not Confirmed
B 3.15 Please confirm that all workers have **written contracts**:	☐ Confirmed ☐ Not Confirmed
B 3.16 Please confirm that **retrenchment** of more than ten percent (10%) of workers has neither been carried out in the last five years nor is planned within the activity to be financed:	☐ Confirmed ☐ Not Confirmed
Sub-contractors and supply chain labour	
B 3.17 Please confirm that you **contractually bind** sub-contractors and your tier-one supply chain to comply at least with relevant local health & safety, labor and environmental laws and regulations:	☐ Confirmed ☐ Not Confirmed

B 3.18 Please confirm that you ensure that child[13] and forced[14] labor is not used by your **sub-contractors** or in your tier-one supply chain:	☐ Confirmed ☐ Not Confirmed
B 3.19 Please confirm that no significant portion (e.g. > 20 % by volume) of your **tier-one suppliers** are mines of any kind, or small-scale farmers, or other small scale enterprises:	☐ Confirmed ☐ Not Confirmed
B 3.20 Please confirm that no significant portion (e.g.> 20%) of your work-force are **migrant labourers, seasonal workers or temporary labour workers** or come from minimum income groups or are women:	☐ Confirmed ☐ Not Confirmed
B4. POLLUTION PREVENTION AND ABATEMENT	
B 4.1 Please confirm that all industrial and domestic effluents are discharged to municipal sewer with necessary approvals, and confirm that you discharge less than 20,000m^3 of effluent/year:	☐ Confirmed ☐ Not Confirmed
B 4.2 Please confirm that **effluents** do not contain hazardous or toxic materials	☐ Confirmed ☐ Not Confirmed
B 4.3 Please confirm that there are no **significant emissions to air** (such as emissions from a thermal combustion plant larger than 3 MW):	☐ Confirmed ☐ Not Confirmed
B 4.4 Please confirm that your total **energy use**, including purchased and self-produced power and heat, is not higher than 25,000 MWh per year:	☐ Confirmed ☐ Not Confirmed
B 4.5 Please confirm that all general industrial **waste is managed** and disposed of in an environmentally sound manner (e.g. it is recycled, re-used, incinerated in dedicated facilities or disposed of in a municipal landfill):	☐ Confirmed ☐ Not Confirmed
B 4.6 Please confirm that **hazardous materials** (such as explosives or toxic chemicals, etc.) are not used or are only present in small quantities (e.g. for laboratory use):	☐ Confirmed ☐ Not Confirmed
B 4.7 Please confirm that **flammable substances** (e.g. fuel or flammable gases etc.) are used, managed and stored with due care:	☐ Confirmed ☐ Not Confirmed
B 4.8 Please confirm **that hazardous wastes** are not generated by the Company:	☐ Confirmed ☐ Not Confirmed
B 4.9 Please confirm that none of the following materials are used / produced / handled or stored by the Company: PCB (including use in transformers), asbestos, **ozone depleting substances** (including use in refrigeration or cooling systems):	☐ Confirmed ☐ Not Confirmed
B 4.10 Please confirm that **Material Safety Data Sheets** (MSDS) are used for all raw materials and as appropriate finished products:	☐ Confirmed ☐ Not Confirmed
B 4.11 ***For projects categorised A (high risk):*** please confirm that the company complies with relevant **Worldbank standards**, respectively where this is not the case that an action plan has been formulated. With the help of this action plan Worldbank standards will be reached in the near future.	☐ Confirmed ☐ Not Confirmed
B 5. COMMUNITY HEALTH & SAFETY AND SECURITY	
B 5.1 Please confirm that there are no significant adverse impacts to **community health & safety** as a result of Company activities (e.g., traffic and infrastructure risks, hazardous materials or wastes, or risks arising from changes to drainage or flood risk):	☐ Confirmed ☐ Not Confirmed
B 5.2 Please confirm that the Company's activities will not increase health **risks to local communities** (e.g. through air or water quality changes, or increased risks from communicable diseases, e. g. AIDS/HIV or malaria):	☐ Confirmed ☐ Not Confirmed
B 5.3 Please confirm that the Company does not use, employ or contract **armed security personnel** to safeguard its workforce and property:	☐ Confirmed ☐ Not Confirmed
B 6. BIODIVERSITY, RESETTLEMENT, INDIGENOUS PEOPLE AND CULTURAL HERITAGE	

[13] Employment of children in a manner that is economically exploitative, or is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development.
[14] Labor which consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty. This covers any kind of involuntary or compulsory labor, such as indentured labor, bonded labor or similar labor-contracting arrangements.

B 6.1 Please confirm that there will be no detrimental impact on **natural habitats**[15] **or endangered species**:	☐ Confirmed ☐ Not Confirmed
B 6.2 Please confirm that the Company's **tier one suppliers** do not obtain materials directly from natural habitats (e.g. wood from forests):	☐ Confirmed ☐ Not Confirmed
B 6.3 Please confirm that the Company's activities will not affect **local communities or ecosystems** as a result of changes to water quality or quantity, air quality or other ecosystem services[16]:	☐ Confirmed ☐ Not Confirmed
B 6.4 Please confirm that **genetically modified organisms** or alien species (e.g. species that are deliberately or inadvertently introduced from outside their natural range) will not be introduced:	☐ Confirmed ☐ Not Confirmed
B 6.5 Please confirm that the Company will not require **resettlement (physical or economic displacement**[17]**)** as a result of its activities, and that there has been no resettlement by government or other parties:	☐ Confirmed ☐ Not Confirmed
B 6.6 Please confirm that no **indigenous people**[18] will be affected by the project:	☐ Confirmed ☐ Not Confirmed
B 6.7 Please confirm that there will be no impacts to **cultural properties** with historical, archaeological, religious significance as a result of the Company's activities or through its supply chains:	☐ Confirmed ☐ Not Confirmed

If any of the above issues are ´Not Confirmed´, please provide details

[15] Natural habitats include land and water areas where the biological communities are formed largely by native plant and animal species, and where human activity has not essentially modified the area's primary ecological functions. They include forests, wetlands, unfarmed grasslands, savannah, coral reefs etc.

[16] Ecosystem services are the goods and services provided by nature. They include fresh water supply, the control of flooding and erosion, maintenance of air quality.

[17] Economic displacement is the loss of assets, or access to assets, that leads to loss of income or means of livelihood as a result of company-related land acquisition.

[18] Indigenous peoples are social groups whose identities, lifestyles, cultures and history's are distinct and different from dominant groups in society.

Annex II
Part ii

Environmental and Social Checklist for category B & C projects

Document is meant to discover red flag issues. To be filled by project officer.

1. COMPANY COMPLIANCE STATEMENTS

B 1. COMPLIANCE WITH THE RELEVANT ENVIRONMENTAL AND SOCIAL GUIDELINES, LAWS AND REGULATIONS	
B 1.1 Please confirm that the Company will fully comply with the relevant environmental and social national and local **laws and regulations**:	☐ Confirmed ☐ Not Confirmed
B 1.2 Please confirm that the Company has obtained all environmental and social/ labor **permits and approvals** necessary for the Company and that these are all valid:	☐ Confirmed ☐ Not Confirmed
B 1.3 Please confirm that, within the past two years, there have been no **objections to the Company** and / or project due to environmental or social factors or land issues (ownership, use):	☐ Confirmed ☐ Not Confirmed
B 1.4 Please confirm that the Company has sufficiently **consulted with relevant stakeholders**[19] about the Company's activities in an appropriate manner and in accordance with local requirements:	☐ Confirmed ☐ Not Confirmed
B 1.5 Please confirm that the local communities or other stakeholders have not expressed **concerns about the Company's activities** in the past two years	☐ Confirmed ☐ Not Confirmed
2. B 2. ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM	
B 2.1 Please confirm that scope[20] and significance of environmental, social, health and safety effects of the project have been fully adequately **assessed and evaluated**:	☐ Confirmed ☐ Not Confirmed
B 2.2 Please confirm that all environmental, social, health and safety issues (including fire safety, and emergency response plans) identified in the assessment are **adequately managed**:	☐ Confirmed ☐ Not Confirmed
3. B 3. LABOR AND WORKING CONDITIONS	
Occupational Health & Safety	
B 3.1 Please confirm that there have been no fatalities, serious injuries or major health risks (such as fires, explosions, sudden release of hazardous substances, traffic accidents, incidents involving evacuation) caused by or related to the Company within the last two years:	☐ Confirmed ☐ Not Confirmed
ILO Core Labor Standards	
B 3.2 Please confirm that no personnel under the age of 18 years is employed and that you have a robust age verification system in place:	☐ Confirmed ☐ Not Confirmed
B 3.3 Please confirm that work is carried out for the Company and its suppliers only voluntarily and not exacted from any individual under threat of force or penalty:	☐ Confirmed ☐ Not Confirmed
B 3.4 Please confirm that the Company has a policy /regulations to prevent workplace discrimination (e.g. gender, ethnicity, political opinion, and religion, national or social origin) with regard to recruitment/promotion/access to training/benefits:	☐ Confirmed ☐ Not Confirmed
B 3.5 Please confirm that workers have the right to organise (e.g. in trade unions) and to be represented on decision making bodies at work and are free to attend meetings on decisions	☐ Confirmed ☐ Not Confirmed

[19] A Stakeholder is an individual or group which may be affected by a company's activities. It is often applied to local communities or groups who live near to a company's assets/ facilities, but also includes employees, investors, Non Governmental Organisations and other groups or individuals.
[20] The scope of the impacts that should be considered is described in the introduction to this questionnaire.

which affect them:

Basic Terms and Conditions of Employment (Wage, Working Hours, contracts etc.)	
B 3.6 Please confirm that the Company pays all workers (permanent and temporary) at more than the local minimum wage or more than US$ 2 per day for a standard working week, whichever is the higher:	☐ Confirmed ☐ Not Confirmed
B 3.7 Please confirm that daily work time including overtime does not exceed 12 hours for more than a maximum three months per year:	☐ Confirmed ☐ Not Confirmed
Sub-contractors and supply chain labour	
B 3.8 Please confirm that the company contractually binds sub-contractors and tier-one supply chain to comply at least with relevant local health & safety, labor and environmental laws and regulations:	☐ Confirmed ☐ Not Confirmed
B 3.9 Please confirm that no significant portion (e.g. > 50 % by volume) of tier-one suppliers are mines of any kind, or small-scale farmers, or other small scale enterprises:	☐ Confirmed ☐ Not Confirmed
B4. POLLUTION PREVENTION AND ABATEMENT	
B 4.1 Please confirm that all industrial and domestic effluents are discharged to municipal sewer with necessary approvals, and confirm that you discharge less than 20,000m^3 of effluent/year:	☐ Confirmed ☐ Not Confirmed
B 4.2 Please confirm that effluents do not contain hazardous or toxic materials	☐ Confirmed ☐ Not Confirmed
B 4.3 Please confirm that the project does not cause any significant nuisance to neighbouring communities (e.g. noise, smell, traffic):	☐ Confirmed ☐ Not Confirmed
B 4.4 Please confirm that all general industrial waste is managed and disposed of in an environmentally sound manner (e.g. it is recycled, re-used, incinerated in dedicated facilities or disposed of in a municipal landfill):	☐ Confirmed ☐ Not Confirmed
4. B 5. COMMUNITY HEALTH & SAFETY AND SECURITY	
B 5.1 Please confirm that there are no significant adverse impacts to community health & safety as a result of Company activities (e.g., traffic and infrastructure risks, hazardous materials or wastes, or risks arising from changes to drainage or flood risk):	☐ Confirmed ☐ Not Confirmed
5. B 6. BIODIVERSITY, RESETTLEMENT, INDIGENOUS PEOPLE AND CULTURAL HERITAGE	
B 6.1 Please confirm that there will be no detrimental impact on natural habitats[21] or endangered species:	☐ Confirmed ☐ Not Confirmed
B 6.2 Please confirm that the Company's tier one suppliers do not obtain materials directly from natural habitats (e.g. wood from forests):	☐ Confirmed ☐ Not Confirmed
B 6.3 If the Company's activities involve harvesting or collection of renewable natural resources (forests, fisheries etc.), please confirm that there is an internationally recognized certification scheme or label in place	☐ Confirmed ☐ Not Confirmed
B 6.4 Please confirm that the Company will not require resettlement (physical or economic displacement[22]) as a result of its activities, and that there has been no resettlement by government or other parties:	☐ Confirmed ☐ Not Confirmed
B 6.5 Please confirm that no indigenous people[23] will be affected by the project:	☐ Confirmed ☐ Not Confirmed
If any of the above issues are ´Not Confirmed´, please provide details	

[21] Natural habitats include land and water areas where the biological communities are formed largely by native plant and animal species, and where human activity has not essentially modified the area's primary ecological functions. They include forests, wetlands, unfarmed grasslands, savannah, coral reefs etc.
[22] Economic displacement is the loss of assets, or access to assets, that leads to loss of income or means of livelihood as a result of company-related land acquisition.
[23] Indigenous peoples are social groups whose identities, lifestyles, cultures and history's are distinct and different from dominant groups in society.

ANNEX III

Part i

SECTOR STUDIES
CHEMICALS SECTOR

Value of industrial production @ 1990 constant prices

		2000	2001	2002	2003	2004	2005
Chemicals, Paints and fertilisers	Rs. Mn	6379	6155	6426	6805	6717	7408
Pharmaceuticals, detergents and other		10,956	10,532	10,911	11,555	11,925	13,087
Chemical industry		**17,335**	**16,687**	**17,337**	**18,360**	**18,642**	**20,495**

Source – Central Bank Report

Sub Categories

- Pharmaceuticals
- Paint
- Cement
- Glass
- Fertilizer & Pesticides
- Ceramics

(A) PHARMACEUTICALS

(e) Industry Description

The pharmaceutical industry includes the manufacture, extraction, processing, purification, and Packaging of chemical materials to be used as medications for humans or animals.

Pharmaceutical Manufacturing is divided into two major stages: the production of the active ingredient for drug (primary processing, or manufacture) and secondary processing, the conversion of the active drugs into products suitable for administration. The products are available as tablets, capsules, liquids (in the form of solutions, suspensions, emulsions, gels, or injectables), creams (usually oil-in-water emulsions), ointments (usually water in-oil emulsions), and aerosols, which contain inhalable products or products suitable for external use.

The major manufactured groups include:

• Antibiotics such as penicillin, streptomycin, tetracyclines, chloramphenicol, and anti fungal
• Other synthetic drugs, including sulfa drugs, anti tuberculosis drugs, anti leprosy drugs, analgesics, anesthetics, and anti malarial
• Vitamins
• Synthetic hormones
• Glandular products
• Drugs of vegetable origin such as quinine, strychnine and brucine, emetine, and digitalis glycosides
• Vaccines and sera
• Other pharmaceutical chemicals
• Surgical sutures and dressings.

The principal manufacturing steps are :

(a) Preparation of process intermediates.
(b) Introduction of functional groups.
(c) Coupling and esterification.
(d) Separation processes such as washing and stripping; and.
(e) Purification of the final product.

Additional product preparation steps include granulation; drying; tablet pressing, printing, and coating; filling; and packaging.

Each of these steps may generate air emissions, liquid effluents, and solid wastes.

(f) Waste Characteristics

The principal air pollutants are volatile organic compounds (VOCs) and particulate matter (PM). Liquid effluents resulting from equipment cleaning after batch operation contain toxic organic residues. Their composition varies, depending on the product manufactured, the materials used in the process, and other process details. Cooling waters are normally recirculated. Some wastewaters may contain mercury, cadmium, isomers of hexachlorocyclohexane, 1.2-dichloroethane, and solvents.

(g) Pharmaceutical Industry in Sri Lanka

Sri Lankan pharmaceutical companies deal with both branded & generic pharmaceuticals, which also includes their own Brands. The largest player is State Pharmaceuticals Corporation of Sri Lanka (SPC). However, in the private sector Glaxo has the largest market share (mainly imports) and Gamma Pharmaceuticals is the- largest manufacturing company. Major players are Astron, SPC, Glaxo & Gamma Pharmaceuticals. Sri Lanka does not manufacture any pharmaceuticals.

(h) Legal framework

- **Sri Lanka Ports Authority Act No.51 of 1979 (last amended in 1992) - Implementing Agency: Sri Lanka Ports Authority.**

This piece of legislation lays down terms and conditions relating to the entry of chemicals defined as 'Dangerous Goods' into the country. Chemicals belonging to this category are specified in the act either by name or by the physical/chemical properties. The act stipulates certain specified procedures and formalities, required by the Sri Lanka Ports Authority, to be conformed to by ships, with regard to entry/unloading of these chemicals through any of the specified ports. (Ref: SLPA act).

- **Customs Ordinance of 1869 (last amended in 1988)**

  Implementing Agency : Sri Lanka Customs Department

Customs Ordinance (CO): Piece of legislation under which the Director General of Customs has been empowered to act upon violations pertaining to imports and exports.

- **Legislation**: Poisons, Opium and Dangerous Drugs Act No 12 of 1952 (last amended in 1984) **Implementing Authority** : Department of Health

This act specifies that a license from the Director of Health Services must be obtained for the importation of specified poisonous chemicals & narcotic substances and bans the importation of particular narcotics such as heroin.

- **Legislation**: Veterinary Drug Control Act No 59 of 1992
  Implementing Authority: Department of Health

Legal instruments/regulations relating to processing, storage, disposal of chemicals.

- **Legislation**: Cosmetic Devices and Drugs Act No 27 of 1980
  Implementing Agency: Cosmetic, Devices and Drugs Authority

This Act specifies that all premises that manufacture, store or sell pharmaceutical products must be licensed and that all pharmaceutical products must be manufactured according to accepted standards including raw material handling. Only products that conform to such standards can be sold and distributed in the country.

- **Central Environmental Authority**

No person shall, on or after the relevant date discharge, deposit or emit waste into the environment, which will cause pollution, or cause noise pollution, except under the authority of a licence issued by the Central Environmental Authority.

Labour related Laws:

- **Legislation**: Factories Ordinance No 45 of 1942 (last amended in 2000)
  Implementing Agency: Department of Labour

This Act stipulates certain safe working conditions to be implemented in factory premises in the interest of the health and safety of factory employees. The Act contains a few specific provisions relating to chemical hazards, Legal Instruments/regulations pertaining to transport of chemicals.

- **Legislation**: Workers Compensation Act No. 19 of 1934 (last amended in 1990)
  Implementing Agency: Department of workmen compensation

This Act specifies the liabilities of the employer in paying compensation to the employee, if he/she is injured in an occupational mishap involving chemicals.

- **Legislation**: The Code of Criminal Procedure

The Public Nuisance Act gives the right to the public to take litigatory action against any of the activities mentioned in it that cause disturbances to normal public life. Public nuisances under the Code includes any trade or occupation or keeping of any goods or merchandise injurious to the health or physical comfort of the community.

A number of other labour laws regulate the various aspects of employer –employee relations, some of which are given below:

(a) Shop and office Employee Act
(b) Wages Board Ordinance
(c) Trade unions Ordinance
(d) Maternity Benefits Act
(e) Factories Ordinance
(f) Workmen's compensation Ordinance
(g) Employees Provident Fund Act
(h) Employees Trust Fund Act
(i) Termination of Employment of workmen (Special Provisions) Act
(j) Industrial Disputes Act

(k) Payment of gratuity Act

(i) Identification of E & S Risks

Environmental /social risks in respect of the industry is minimal since we do not manufacture any pharmaceuticals. These risks will apply when in the manufacturing process.

(B) PAINT

(a) Industry Description

This industry comprises Companies primarily involved in the manufacture of various paints, timber finishes and other surface coatings products for the decoration and protection of surfaces against wear, weather and corrosion. Key products include paints, varnishes, lacquers, and stains. Key product groups are architectural coatings, industrial products, special purpose coatings and miscellaneous coatings.

Paint manufacture is a relatively simple batch process. Basically, this is a physical process where raw materials such as pigment, a pigment vehicle, binder, solvents and additives are mixed in quantities ranging from 1,000 litres to 20,000 litres.

Ingredients

There are four main components in any paint formula:

1) Powders
2) Resin or Binder
3) Solvent or Carrier
4) Additives

The primary activities of companies in this industry are:

- Architectural coatings (i.e., paint) manufacturing.
- Calcimines manufacturing.
- Dispersions, pigment, manufacturing.
- Dopes, paint, and lacquer, manufacturing.
- Driers, paint, and varnish, manufacturing.
- Enamel paints manufacturing.
- Epoxy coatings made from purchased resins.
- Fillers, wood (e.g., dry, liquid, paste), manufacturing.
- Frit manufacturing.
- Glaziers' putty manufacturing
- Industrial product finishes and coatings (i.e., paint) manufacturing.
- Lacquers manufacturing.
- Latex paint (i.e., water based) manufacturing.
- Marine paints manufacturing.
- Motor vehicle paints manufacturing.
- Paint and varnish removers manufacturing.
- Paint thinner and reducer preparations manufacturing.
- Paintbrush cleaners manufacturing.
- Paints (except artist's) manufacturing.
- Paints, emulsion (i.e., latex paint), manufacturing.
- Paints, oil and alkyd vehicle, manufacturing.
- Plastic wood fillers manufacturing.
- Plastisol coating compounds manufacturing.
- Polyurethane coatings manufacturing.

- Powder coatings manufacturing.
- Primers, paint, manufacturing.
- Shellac manufacturing.
- Stains (except biological) manufacturing.
- Varnishes manufacturing.
- Water repellent coatings for wood, concrete and masonry manufacturing.

Paint sector (Architectural) in Sri Lanka has companies that do the business of Manufacture & Selling of Paints under the various brands. These paints are produced for both the local & international markets. Currently Macksons Paints (Multilac) are the no.1 exporter of paints in Sri Lanka. The highest market share in the country is currently held by CIC (Dulux) paints which is followed by Macksons Paints. Other players in the Market are Asian Paints and Nippolac.

(b) Legal framework

- **Customs Ordinance of 1869 (last amended in 1988)**

  Implementing Agency: Sri Lanka Customs Department

Customs Ordinance (CO): Piece of legislation under which the Director General of Customs has been empowered to act upon violations pertaining to imports and exports.

- **Central Environmental Authority**

No person shall, on or after the relevant date discharge, deposit or emit waste into the environment, which will cause pollution, or cause noise pollution, except under the authority of a license issued by the Central Environmental Authority.

Labour related Laws:

- **Legislation**: Factories Ordinance No 45 of 1942 (last amended in 2000)
  Implementing Agency: Department of Labour

This Act stipulates certain safe working conditions to be implemented in factory premises in the interest of the health and safety of factory employees. The Act contains a few specific provisions relating to chemical hazards, Legal Instruments/regulations pertaining to transport of chemicals

- **Legislation**: Workers Compensation Act No. 19 of 1934 (last amended in 1990)
  Implementing Agency: Department of workmen compensation

This Act specifies the liabilities of the employer in paying compensation to the employee, if he/she is injured in an occupational mishap involving chemicals.

- **Legislation**: The Code of Criminal Procedure

The Public Nuisance Act gives the right to the public to take litigatory action against any of the activities mentioned in it that cause disturbances to normal public life. Public nuisances under the Code includes any trade or occupation or keeping of any goods or merchandise injurious to the health or physical comfort of the community

A number of other labour laws regulate the various aspects of employer–employee relations, some of which are given below:

(a) Shop and office Employee Act

(b) Wages Board Ordinance
(c) Trade unions Ordinance
(d) Maternity Benefits Act
(e) Factories Ordinance
(f) Workmen's compensation Ordinance
(g) Employees Provident Fund Act
(h) Employees Trust Fund Act
(i) Termination of Employment of workmen (Special Provisions) Act
(j) Industrial Disputes Act
(k) Payment of gratuity Act

(c) Identification of E & S Risks

ENVIRONMENT	SOCIAL
➢ Location of the plant not in a industrial Processing Zone	
➢ Paints are a major source of indoor air pollution	➢ Unprotected/not properly maintained machinery would result in workers getting electrocuted /exposed to accidents
➢ Air Pollution Virtually all solvents are flammable, and even their vapours can ignite. Risk of using solvents near open flames	➢ Energy wastage by leakages
➢ Latex paint can be highly toxic to the environment. It harms fish and wildlife, and contaminates the food chain if poured down a storm drain. It can also pollute groundwater if dumped on the ground.	Health in General ➢ Effect of handling toxic material on employees health ➢ Inadequate sanitation/Ventilation systems ➢ No periodical medical check ups on personnel handing hazardous material
➢ post-application wastage and disposal. The petrochemical paints that currently dominate the market are predominately derived from oil, a non-renewable resource.	Safety in General ➢ Dangers in not implementing proper fire prevention/safety programs, ➢ Personnel not trained in safety matters (eg: accident prevention, safe lifting practices, safe chemical handling practices, maintenance of machinery) ➢ Non availability of first aid facilities
➢ Not following local regulations in storing hazardous material	

(C) CEMENT

(a) Industry Description

The preparation of cement involves mining, crushing, and grinding of raw materials (principally limestone and clay); calcining the materials in a rotary kiln; cooling the resulting clinker; mixing the clinker with gypsum; and milling, storing, and bagging the finished cement. The process generates a variety of wastes, including dust, which is captured and recycled to the process. The process is very energy-intensive, and there are strong incentives for energy conservation.

Environmental issues in cement primarily include the following:

- Air Emissions
- Energy consumption and fuels
- Wastewater
- Solid waste generation
- Noise

(b) Waste Characteristics

The generation of fine particulates is inherent in the process, but most are recovered and recycled. Approximately 10–20% of the kiln feed can be suspended in the kiln exhaust gases, captured, and returned to the feed. Other sources of dust emissions include the clinker cooler, crushers, grinders, and materials-handling equipment. When the raw materials have high alkali or chloride content, a portion of the collected dust must be disposed of as solid waste, to avoid alkali buildup. Other materials handling operations, such as conveyors, result in fugitive emissions.

Ambient particulate levels have been clearly demonstrated to be related to health impacts. Gases such as nitrogen oxides (NO2) and sulfur oxides (SO2) are formed from the combustion of the fuel (oil and coal) and oxidation of sulfur present in the raw materials, but the highly alkaline conditions in the kiln can absorb up to 90% of the sulfur oxides. Heavy metals may also be present in the raw materials and fuel used and are released in kiln gases. Cement kilns, with their high flame temperatures, are sometimes used to burn waste oils, solvents, and other organic wastes. These practices can result in the release of toxic metals and organics.

(c) Cement Industry in Sri Lanka

The main players in the cement industry in Sri Lanka are Holcim Cement with 30% share and Tokyo Cement with 30 % share. The other major players include Lafarge, L & T and Ambuja.

(d) Legal framework

- **Customs Ordinance of 1869 (last amended in 1988)**

  Implementing Agency: Sri Lanka Customs Department

Customs Ordinance (CO): Piece of legislation under which the Director General of Customs has been empowered to act upon violations pertaining to imports and exports.
Labour related Laws:

- **Central Environmental Authority**

No person shall, on or after the relevant date discharge, deposit or emit waste into the environment, which will cause pollution, or cause noise pollution, except under the authority of a license issued by the Central Environmental Authority.

- **Legislation**: Factories Ordinance No 45 of 1942 (last amended in 2000)
  Implementing Agency: Department of Labour

This Act stipulates certain safe working conditions to be implemented in factory premises in the interest of the health and safety of factory employees. The Act contains a few specific provisions relating to chemical hazards, Legal Instruments/regulations pertaining to transport of chemicals.

- **Legislation**: Workers Compensation Act No. 19 of 1934 (last amended in 1990)
  Implementing Agency: Department of workmen compensation

This Act specifies the liabilities of the employer in paying compensation to the employee, if he/she is injured in an occupational mishap involving chemicals.

- **Legislation**: The Code of Criminal Procedure

The Public Nuisance Act gives the right to the public to take litigatory action against any of the activities mentioned in it that cause disturbances to normal public life. Public nuisances under the Code includes any trade or occupation or keeping of any goods or merchandise injurious to the health or physical comfort of the community.

A number of other labour laws regulate the various aspects of employer –employee relations, some of which are given below:

(a) Shop and office Employee Act
(b) Wages Board Ordinance
(c) Trade unions Ordinance
(d) Maternity Benefits Act
(e) Factories Ordinance
(f) Workmen's compensation Ordinance
(g) Employees Provident Fund Act
(h) Employees Trust Fund Act
(i) Termination of Employment of workmen (Special Provisions) Act
(j) Industrial Disputes Act
(k) Payment of gratuity Act

(e) Identification of E & S Risks

ENVIRONMENT	SOCIAL
Location of the plant not in a industrial Processing Zone	Unprotected/not properly maintained machinery would result in workers getting electrocuted /exposed to accidents
• Air Pollution Generation of fine particulates which is inherent in the process. Other sources of dust emissions include the clinker cooler, crushers, grinders, and materials-handling equipment. Grinding mill operations also result in particulate emissions. Other materials handling operations, such as conveyors, resulting fugitive emissions	Energy wastage by leakages
• Solid waste Solid wastes such as pulverized fly ash.	Health in General ➢ Effect of handling hazardous material on employees health ➢ Inadequate sanitation/Ventilation systems ➢ No periodical medical check ups on personnel handing hazardous material
Noise pollution	Safety in General ➢ Dangers in not implementing proper fire prevention/safety programs, ➢ Personnel not trained in safety matters (eg: accident prevention, safe lifting practices, safe chemical handling practices, maintenance of machinery) ➢ Personnel not provided with protective gear when handling hazardous material ➢ Non availability of first aid facilities
Not following local regulations in storing hazardous material.	➢ Work place noise. Personnel not provided with hearing protection gear when exposed to prescribed noise levels
High Energy usage/Inefficient energy usage in production process	
Liquid effluents from cooling operations	

(D) GLASS

(a) Industry Description

There are two types of glass i.e. flat glass and pressed & blown glass. Flat glass includes plate and architectural glass, automotive windscreens, and mirrors. Pressed and blown glass includes containers, machine-blown and hand-blown glassware, lamps, and television tubing. In both categories, a glass melt is prepared from silica sand, other raw materials such as lime, dolomite, and soda, and cullet (broken glass). The use of recycled glass is increasing. It reduces the consumption of both raw materials and energy but necessitates extensive sorting and cleaning prior to batch treatment to remove impurities .For the manufacture of special and technical glass, lead oxide, potash, zinc oxide, and other metal oxides are added. Refining agents include arsenic trioxide, antimony oxide, nitrates, and sulfates. Metal oxides and sulfides are used as coloring or de coloring agents. The most common furnace used for manufacturing glass melt is the continuous regenerative type, with either the side or the end ports connecting brick checkers to the inside of the melter.

The molten glass is refined and is then pressed, blown, drawn, rolled, or floated, depending on the final product. Damaged and broken product (cullet) is returned to the process. The most important fuels for glass-melting furnaces are natural gas, light and heavy fuel oil, and liquefied petroleum gas. Electricity (frequently installed as supplementary heating) is also used.

(b) Waste Characteristics

Two types of air emissions are generated: those from the combustion of fuel for operating the glass-melting furnaces, and fine particulates from the vaporization and recrystallization of materialsin the melt. The main emissions are sulfuroxides (SO2), nitrogen oxides (NO2), and particulates, which can contain heavy metals such asarsenic and lead. Particulates from lead crystal manufacture can have a lead content of 20–60%and an arsenic content of 0.5–2%.

In all cases, the concentration of heavy metals and other pollutants in the raw flue gas mainly depends on the type of fuel used, the composition of the feed material, and the portion of recycled glass. Liquid effluents also result from forming, finishing, coating, and electroplating operations.

(c) Glass Industry in Sri Lanka

The glass sector in Sri Lanka is split into three segments – Glass bottles; Glass sheets; Glass mirrors. Glass bottles are dominated by Ceylon Glass Co. Ltd who has a monopoly in this market. The other two segments are mainly divided among family owned companies. These include Semage's & Colombo Picture Palace and Asoka glass who import and sell the glass sheets &/or mirrors.

(d) Legal framework

- **Customs Ordinance of 1869 (last amended in 1988)**

  Implementing Agency: Sri Lanka Customs Department

Customs Ordinance (CO): Piece of legislation under which the Director General of Customs has been empowered to act upon violations pertaining to imports and exports.

- **Central Environmental Authority**

No person shall, on or after the relevant date discharge, deposit or emit waste into the environment, which will cause pollution, or cause noise pollution, except under the authority of a licence issued by the Central Environmental Authority.

Labour related Laws:

- **Legislation**: Factories Ordinance No 45 of 1942 (last amended in 2000)
  Implementing Agency: Department of Labour

This Act stipulates certain safe working conditions to be implemented in factory premises in the interest of the health and safety of factory employees.

- **Legislation**: Workers Compensation Act No. 19 of 1934 (last amended in 1990)
  Implementing Agency: Department of workmen compensation

This Act specifies the liabilities of the employer in paying compensation to the employee, if he/she is injured in an occupational mishap involving chemicals.

- **Legislation**: The Code of Criminal Procedure

The Public Nuisance Act gives the right to the public to take litigatory action against any of the activities mentioned in it that cause disturbances to normal public life. Public nuisances under the Code includes any trade or occupation or keeping of any goods or merchandise injurious to the health or physical comfort of the community.

A number of other labour laws regulate the various aspects of employer –employee relations, some of which are given below:

(a) Shop and office Employee Act
(b) Wages Board Ordinance
(c) Trade unions Ordinance
(d) Maternity Benefits Act
(e) Factories Ordinance
(f) Workmen's compensation Ordinance
(g) Employees Provident Fund Act
(h) Employees Trust Fund Act
(i) Termination of Employment of workmen (Special Provisions) Act
(j) Industrial Disputes Act
(k) Payment of gratuity Act

(e) Identification of E & S Risks

ENVIRONMENT	SOCIAL
➢ Location of the plant not in a industrial Processing Zone	Unprotected/not properly maintained machinery would result in workers getting electrocuted /exposed to accidents
➢ Air emissions Two types of air emissions are generated: those from the combustion of fuel for operating the glass-melting furnaces, and fine particulates from the vaporization and recrystallization of materials in the melt. The main emissions are sulfuroxides (SO2), nitrogen oxides (NO2), and particulates, which can contain heavy metals	Energy wastage by leakages
➢ Dispose of solid wastes Heavy metals used as refining and colouring or decolouring agents.	Health in General ➢ Effect of handling hazardous material on employees health ➢ Inadequate sanitation/Ventilation systems ➢ No periodical medical check ups on personnel handing hazardous material
➢ Discharge of Liquid effluents resulting from forming, finishing, coating and electroplating operations.	Safety in General ➢ Dangers in not implementing proper fire prevention/safety programs, ➢ Personnel not trained in safety matters (eg: accident prevention, safe lifting practices, safe chemical handling practices, maintenance of machinery) ➢ Personnel not provided with protective gear when handling hazardous material ➢ Non availability of first aid facilities
➢ High Energy intensive industry. Therefore energy wastage is likely to occur.	➢ Work place noise. Personnel not provided with hearing protection gear when exposed to prescribed noise levels
➢ Use of fossil fuel may emit various emissions	
➢ Not following local regulations in storing hazardous material.	

(E) FERTILIZER & PESTICIDES

(a) Fertilizer

(i) Industry Description

Sri Lanka imports its fertilizer and operates mixing plants to suit various cultivations. Mixed fertilizers contain two or more of the elements nitrogen, phosphorus, and potassium (NPK), which are essential for good plant growth and high crop yields. The production of ammonium phosphates nitro phosphates, potash, and compound fertilizers.

Ammonium phosphates are produced by mixing phosphoric acid and anhydrous ammonia in a reactor to produce slurry. (This is the mixed acid route for producing NPK fertilizers; potassium and other salts are added during the process.) The slurry is sprayed onto a bed of recycled solids in a rotating granulator, and ammonia is sparged into the bed from underneath. Granules pass to a rotary dryer followed by a rotary cooler. Solids are screened and sent to storage for bagging or for bulk shipment.

(ii) Waste Characteristics

In a fertilizer plant, the main source of potential pollution is solids from spills, operating upsets and dust emissions.

Fluorides and dust are emitted to the air from the fertilizer plant. All aspects of phosphate rock processing and finished product handling generate dust, from grinders and pulverizers, pneumatic conveyors, and screens.

A sulfuric acid plant has two principal air emissions: sulfur dioxide and acid mist. If pyritesore is roasted, there will also be particulates in air emissions that may contain heavy metals such as cadmium, mercury, and lead. Sulfuric acid plants do not normally discharge liquid effluents except where appropriate water management measures are absent. Solid wastes from a sulfuric acid plant will normally be limited to spent vanadium catalyst.

(b) Pesticides

(i) Industry Description

Sri Lanka imports its entire pesticides requirement. The major chemical groups that are formulated include:

- Insecticides
- Fungicides
- Herbicides
- Rodenticides

The main purpose of pesticide formulation is to manufacture a product that has optimum biological efficiency, is convenient to use, and minimizes environmental impacts. The active ingredients are mixed with solvents, adjuvants (boosters), and fillers as necessary to achieve the desired formulation. The types of formulations include wettable powders, soluble concentrates, emulsion concentrates, oil-in-water emulsions, suspension concentrates, suspoemulsions, water dispersible granules, dry granules, and controlled release, in which the active ingredient is released into the environment from a polymeric carrier, binder, absorbent, or encapsulant at a slow and effective rate. The formulation steps may generate air emissions, liquid effluents, and solid wastes.

(c) Waste Characteristics

The principal air pollutants are particulate matter and volatile organic compounds. These are released from mixing and coating operations. Most liquid effluents result from spills, the cleaning of equipment, and process wastewaters. The effluents may contain toxic organics, including Pesticide residues.

Major solid wastes of concern include contaminated discarded packaging and process residues. There will also be effluent treatment sludges. The solid wastes generated depend on the process.

(d) Industry in Sri Lanka

Most fertilizers & Pesticides in Sri Lanka are imported with nearly 73% going to the private sector. Main use of fertilizer & Pesticides are for paddy, coconut & other food crops. Increase in use is dependent on a favourable climate, satisfactory product prices and subsidized prices for urea. There are a number of players in the Fertilizer business. The main players and their market shares are Ceylon Fertilizer (23%), CIC Fertilizer (22%) & A. Baurs (21%).

(e) Legal framework

- **Sri Lanka Ports Authority Act No.51 of 1979 (last amended in 1992**)
  Implementing Agency: Sri Lanka Ports Authority

This piece of legislation lays down terms and conditions relating to the entry of chemicals defined as 'Dangerous Goods' into the country. Chemicals belonging to this category are specified in the act either by name or by the physical/chemical properties. The act stipulates certain specified procedures and formalities, required by the Sri Lanka Ports Authority, to be conformed to by ships, with regard to entry/unloading of these chemicals through any of the specified ports. (Ref: SLPA act)

- Customs Ordinance of 1869 (last amended in 1988)

  Implementing Agency*:* Sri Lanka Customs Department

Customs Ordinance (CO): Piece of legislation under which the Director General of Customs has been empowered to act upon violations pertaining to imports and exports.

- **Import and Export Control Act No.1 of 1969 (last amended in 1987)**
  Implementing Agency: Department of Imports and Exports Control

This Act has introduced the 'Special Import License Scheme (SIL)' under which chemicals that come under the scheme cannot be imported without a license issued by the Controller of Imports and Exports. The license is issued on recommendations/certification given by the relevant body (Eg: Fertilizer from the Fertilizer Secretariat). On the arrival of these chemicals to the country, clearance from the Import Control Department must be obtained before the Customs Officials can release the goods to the importer.

The Act has provisions for further additions to the dangerous chemicals list through gazette notifications.

- **Legislation: Fertilizer Act No. 68 of 1988 (with amendments)**
  Implementing Agency: National Fertilizer Secretariat (NFS)

This Act provides the National Fertilizer Secretariat with authority to issue licenses to importers of fertilizers and fertilizer raw materials, which is subjected to periodic renewal. The licenses are granted based upon technical advice given by the relevant agricultural body. For items that come under 'SIL' a license from the Controller of Imports and Exports must be obtained.

- **Board Of Investment (BOI) law No.4 of 1978 (last amended in 1992)**
  Implementing Agency: Board of Investment (BOI)

Under Section 17(1) of the BOI Act of 1978 and as amended, BOI shall have the power to grant exemptions from any law referred to in schedule B to BOI Law No 4 of 1978 and as amended or to modify or vary the application of any such laws to such enterprises in accordance with such regulations as may be made by the Minister. As such a clause to this effect can not be incorporated in the agreement which is signed between the board and the enterprise enabling to import chemical and chemical allied product on approval from the BOI, as import export control Act No 1. 1969 has not been introduced to the schedule 'B' to BOI Law.

BOI enterprise can import chemicals and equipment, which are required for operating the particular industry. After submitting the list of chemicals and equipments to the Appraisal Dept of the BOI to obtain the approval, the list of chemicals and equipment is referred to the Environment Department. Accordingly, the Environment department gives recommendations to the Investor Services Dept of BOI for clearing chemicals/equipment. In the event the list is changed, investor Services Dept advice from the Environment Dept whereupon an inquiry is held and instructions are given.

This act also grants power to the BOI to carry out Environmental Impact Assessment and issue Environment Protection Licenses for BOI projects.

- **Legislation: Control of Pesticides Act, No 30 0f 1980:2.1 Control of Pesticides (Amendment) Act, No 6 of 1994**
  Implementing agency: Registrar of Pesticides

Under this Act all pesticides are required to be registered with the Registrar of pesticides prior to sale. Further the Act requires, prior to registration of a pesticide, a statement of the claim made by the manufacturer or producer of such pesticides as to its "Use, potency, stability in storage and the period of usage" in addition to a statement with regard to its " efficiency and crop safety supported by the results of any experimental data as evidence".

Person applying for import of a pesticide should submit all relevant data pertaining to the pesticides which include its physical and chemical properties, toxicological data, methods of analysis, etc. Before license is granted for import the container and the label is also approved.

- **Central Environmental Authority**

No person shall, on or after the relevant date discharge, deposit or emit waste into the environment, which will cause pollution, or cause noise pollution, except under the authority of a licence issued by the Central Environmental Authority.

Labour related Laws:

- **Legislation**: Factories Ordinance No 45 of 1942 (last amended in 2000)
  Implementing Agency: Department of Labour

This Act stipulates certain safe working conditions to be implemented in factory premises in the interest of the health and safety of factory employees. The Act contains a few specific provisions relating to chemical hazards.

Legal Instruments/regulations pertaining to transport of chemicals

- **Legislation**: Workers Compensation Act No. 19 of 1934 (last amended in 1990)
  Implementing Agency: Department of workmen compensation

This Act specifies the liabilities of the employer in paying compensation to the employee, if he/she is injured in an occupational mishap involving chemicals.

- **Legislation**: The Code of Criminal Procedure

The Public Nuisance Act gives the right to the public to take litigatory action against any of the activities mentioned in it that cause disturbances to normal public life. Public nuisances under the Code includes any trade or occupation or keeping of any goods or merchandise injurious to the health or physical comfort of the community

A number of other labour laws regulate the various aspects of employer –employee relations, some of which are given below:

(a) Shop and office Employee Act
(b) Wages Board Ordinance
(c) Trade unions Ordinance
(d) Maternity Benefits Act
(e) Factories Ordinance
(f) Workmen's compensation Ordinance
(g) Employees Provident Fund Act
(h) Employees Trust Fund Act
(i) Termination of Employment of workmen (Special Provisions) Act
(j) Industrial Disputes Act
(k) Payment of gratuity Act

(f) Identification of E & S Risks

(i) Fertilizer

Environmental risks in respect of the industry is minimal since we have only fertilizer mixing plants

ENVIRONMENT	SOCIAL
Air emissions Emission of Fluoride and dust .All aspects of finished product handling generate dust from grinders and pulverizers, pneumatic conveyors and screens.	Unprotected/not properly maintained machinery would result in workers getting electrocuted /exposed to accidents
Discharge of Liquid Effluents. Effluents can contain nitrogen, phosphorus, and fluorine.	Health in General ➢ Effect of handling toxic material on employees health ➢ Inadequate sanitation/Ventilation systems ➢ No periodical medical check ups on personnel handing hazardous material
Not following local regulations in storing Toxic material.	Safety in General ➢ Dangers in not implementing proper fire prevention/safety programs, ➢ Personnel not trained in safety matters (eg: accident prevention, safe lifting practices, safe chemical handling practices, maintenance of machinery) ➢ Personnel not provided with protective gear when handling hazardous material ➢ Non availability of first aid facilities
	➢ Work place noise. Personnel not provided with hearing protection gear when exposed to prescribed noise levels

(ii) Pesticides

Environmental risks in respect of the industry is minimal since we do not manufacture any pesticides Risks will arise on account of bottling of pesticides for sale.

ENVIRONMENT	SOCIAL
Discharge of Liquid Effluent Most liquid effluents result from spills, the cleaning of equipment. The effluents may contain toxic organics, including pesticide residues	Unprotected/not properly maintained machinery would result in workers getting electrocuted /exposed to accidents
Not following local regulations in storing hazardous material.	Health in General ➢ Effect of handling toxic material on

	employees health ➢ Inadequate sanitation/Ventilation systems ➢ No periodical medical check ups on personnel handing hazardous material
	Safety in General ➢ Dangers in not implementing proper fire prevention/safety programs, ➢ Personnel not trained in safety matters (eg: accident prevention, safe lifting practices, safe chemical handling practices, maintenance of machinery) ➢ Personnel not provided with protective gear when handling hazardous material ➢ Non availability of first aid facilities
	➢ Work place noise. Personnel not provided with hearing protection gear when exposed to prescribed noise levels
	Unprotected/not properly maintained machinery would result in workers getting electrocuted /exposed to accidents

(F) CERAMICS

(a) Industry Description

The Ceramics industry is composed of three major segments: tableware, (porcelain, stoneware or earthenware); ornamental artware (such as figurines, statuary, and decorations); and ceramic tile (including wall tile and floor tile).

o Tableware

Ceramic tableware is a ceramic houseware such as plates, kettles, cup and saucers. The ceramic goods are produced through a process starting from the processing of basic materials, shaping, glazing process and burning, The basic materials for ceramics include clay, kaolin, quartz sand, feldspar, etc. In the early phase of the process, all basic materials after being processed are made ready for casting burned under a certain temperature so as not to cause damage or defect. There are several methods of shaping the material into a desired form. For example, casting is one of the methods in the shaping process to produce ceramic teapots and cups. Saucers are shaped through pressing and plates are shaped through jiggering process. The half finished products already having certain forms, are then burned, glazed and decorated.

Tableware industry in Sri Lanka

- Mostly export – 80% or more
- Facing competition from global producers
- Oversupply and shift in demand
- Competition on price no longer possible
- Has to reposition to a higher level
- Issues with imported raw materials

- **Ceramic Tiles**

The ceramic tile manufacturing process consists of a series of successive stages, which can be summarised as follows:

§ Raw materials preparation
§ Pressing and drying of the green body
§ Firing, with or without glazing
§ Additional treatments
§ Sorting and packing

Depending on whether the product to be made is glazed or not, and whether single fire, twice fire or third fire is involved, the tile will or will not be glazed in a given process, or the order of the glazing and firing stages will be suitably rearranged.

Ceramic Tile Industry in Sri Lanka :

- Mostly for the local market
- Problems with "dumping" (price and quality)
- Many problems with locally sourced raw materials
- Problems with laws pertaining to mining agricultural lands

- **Ornamentalware**

- Highly labour intensive
- Mostly for the export market

(b) Waste Characteristics - ceramic tile and tableware

Environmental issues associated with ceramic tile and tableware manufacturing primarily include the following:
· Emissions to air
· Wastewater
· Solid waste

Emissions to Air

Air emissions may be generated from storage and handling of raw materials and during firing or spray drying of ceramics. In the latter case, emissions may be derived from the raw materials and / or from the fuels employed for heat and power generation.

Particulate Matter

The main sources of particulate matter emissions include the handling of raw materials (e.g. screening, mixing, weighing, and transporting/conveying); dry grinding / milling (less common than wet milling); drying (e.g. spray drying); glaze-spraying processes (e.g. for both tiles and sanitary ware production);ware decorating and firing; and fired ware finishing operations.

Sulfur Oxides
The emission of SO2 in ceramic kiln exhaust gases depends on the sulfur content of the fuel and certain raw materials (e.g.gypsum, pyrite, and other sulfur compounds). The presence of carbonates in raw materials may, however, prevent the formation of sulfur emissions because of their reaction with SO2.

Nitrogen Oxides
The main sources of NOX are the generation of thermal NOX caused by high firing temperatures in the kiln, the nitrogen content in the raw materials, and the oxidation of nitrogen contained in fuels.

Chlorides and Fluorides
Chlorides and fluorides are pollutants found in waste gases from ceramic kilns, and are generated from impurities in clay materials. The use of additives and water containing chloride during the preparation of the raw materials may generate hydrochloric acid (HCl) emissions. Hydrofluoric acid (HF) maybe generated by the decomposition of clay fluorosilicates.

Wastewater
Process wastewater is mainly generated from cleaning water in preparation and casting units, and various process activities (e.g. glazing, decorating, polishing, and wet grinding). Process wastewater is characterized by turbidity and coloring, due to the very fine suspended particles of glaze and clay minerals. The potential pollutants of concern include suspended solids (e.g.clays and insoluble silicates), suspended and dissolved heavy metals (e.g. lead and zinc), sulfates, boron, and traces of organic matter.

Solid Wastes.
Process waste originating from the manufacture of ceramic products mainly consists of different types of sludge, including sludge from process wastewater treatment, and process sludge resulting from glazing, plaster, and grinding activities. Other process wastes include broken ware from process activities (e.g. shaping, drying, and firing); broken refractory material; solids from dust treatments (e.g. flue-gas cleaning and dedusting); spent plaster molds; spent sorption agents (e.g.granular limestone and limestone dust); and packaging waste (e.g. plastic, wood, metal, paper).

(c) Ceramics Industry in Sri Lanka

There are at present approximately 30 ceramic companies in operation locally, seven of which are large with the remaining being small or medium scale enterprises. Competition among the larger firms is healthy and there is distinct product differentiation among manufacturers. The Sri Lanka Ceramics industry has some significant operational strengths, including a highly skilled workforce, relatively low labor costs, excellent management at the factory level, and design confidentiality/integrity.

Total industry employment currently stands at approximately 20,000 thought the quality of the workforce is considered sound, inflation and rising wages have been fast eroding the advantage of low cost manufacturing.

On the supply side, Sri Lanka does not have the large oil and natural gas deposits of some of its Asian competitors such as Indonesia and Malaysia, so it primarily uses imported LP gas as the main source of energy. Energy costs are therefore relatively high. Raw materials such as Kaolin and Feldspar can be sourced locally but certain key raw materials, such as china or ball clays, need to be imported from the United Kingdom or elsewhere to satisfy the whiteness of body needed for porcelain.

Overall, the Ceramic industry in Sri Lanka has reached a stage of stagnation. Ceramic exports have not grown for the last 10 years and the number of people employed in the industry directly and indirectly has remained static. Some of the contributing factors cited by the industry include a lack of (a) Brand and quality recognition (b) Understanding of consumers needs (c) Cost-effective energy sourcing (d) Consistency in quality of raw materials (e) Value-adding capabilities at firm level and (f) Readiness to use advanced technology for expanding product range and capturing new markets.

(d) Legal framework

- **Agrarian Development Act** - Under the Agrarian Development Act paddy lands are not supposed to be used for mining, not even land that is no longer viable for paddy cultivation.

- Customs Ordinance of 1869 (last amended in 1988)

  Implementing Agency: Sri Lanka Customs Department

Customs Ordinance (CO): Piece of legislation under which the Director General of Customs has been empowered to act upon violations pertaining to imports and exports.

- **Legislation**: Industrial Promotion Act No.46 of 1990
  Implementing Agency: Ministry of Industrial Promotion

This Act empowers the Ministry to grant approval/recommendation for the importation of chemicals that are restricted and under import control license.

No person shall carry on an industry specified in following schedule except under the authority of and otherwise than in accordance with the conditions of a license issued in that behalf by the secretary to the ministry of the Minister.

1. Any industry with foreign investment.
2. Any industry employing high technology.
3. Any industry producing goods for export from Sri Lanka.
4. Any industry exploring, extracting or processing minerals or non-renewable natural resources.
5. Any industry manufacturing arms and ammunition explosives, military vehicles and equipment, aircraft and an; other military hardware.
6. Any industry manufacturing poisons narcotics, alcohol, dangerous drugs, and toxic, hazardous and carcinogenic materials.
7. Any industry producing currency, coins and security documents.
8. Any industry where:-
   a. The value of capital investment in plant and equipment Exceeds four million rupees and.
   b. The number of permanent employees employed in such industry exceeds fifty.
9. Any industry which is owned by the Government or by a company in which the Government holds a majority of the shares.

- **Central Environmental Authority**

No person shall, on or after the relevant date discharge, deposit or emit waste into the environment, which will cause pollution, or cause noise pollution, except under the authority of a licence issued by the Central Environmental Authority

Labour related Laws:

- **Legislation**: Factories Ordinance No 45 of 1942 (last amended in 2000)
  Implementing Agency: Department of Labour

This Act stipulates certain safe working conditions to be implemented in factory premises in the interest of the health and safety of factory employees. The Act contains a few specific provisions relating to chemical hazards.

Legal Instruments/regulations pertaining to transport of chemicals

- **Legislation**: Workers Compensation Act No. 19 of 1934 (last amended in 1990)
  Implementing Agency: Department of workmen compensation

This Act specifies the liabilities of the employer in paying compensation to the employee, if he/she is injured in an occupational mishap involving chemicals.

- **Legislation**: The Code of Criminal Procedure

The Public Nuisance Act gives the right to the public to take litigatory action against any of the activities mentioned in it that cause disturbances to normal public life. Public nuisances under the Code includes any trade or occupation or keeping of any goods or merchandise injurious to the health or physical comfort of the community

A number of other labour laws regulate the various aspects of employer –employee relations, some of which are given below:

(a) Shop and office Employee Act.
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(d) Maternity Benefits Act.
(e) Factories Ordinance.
(f) Workmen's compensation Ordinance.
(g) Employees Provident Fund Act.
(h) Employees Trust Fund Act.
(i) Termination of Employment of workmen (Special Provisions) Act.
(j) Industrial Disputes Act.
(k) Payment of gratuity Act

(e) Identification of E & S Risks

ENVIRONMENT	SOCIAL
• Liquid Effluents from the Process	Unprotected/not properly maintained machinery would result in workers getting electrocuted /exposed to accidents
• Ambient Noise	Health in General ➢ Effect of handling toxic material on employees health ➢ Inadequate sanitation/Ventilation systems ➢ No periodical medical check ups on personnel handing hazardous material
• Air pollution with dust	Safety in General ➢ Dangers in not implementing proper fire prevention/safety programs, ➢ Personnel not trained in safety matters (eg: accident prevention, safe lifting practices, safe chemical handling practices, maintenance of machinery) ➢ Personnel not provided with protective gear when handling hazardous material ➢ Non availability of first aid facilities

Not following local regulations in storing hazardous material.	➢ Work place noise. Personnel not provided with hearing protection gear when exposed to prescribed noise levels
High Energy usage/Inefficient energy usage in production process	Unprotected/not properly maintained machinery would result in workers getting electrocuted /exposed to accidents

SECTOR STUDIES
COMMERCIAL SERVICES SECTOR (HEALTH CARE)

1. Sub Categorization

Healthcare sector can be sub categorized into the following areas as listed below ;

i. Hospitals(general and private)
ii. Nursing homes and clinics
iii. Laboratories and research institutes
iv. Ancillary service providers – blood banks and morgues
v. Manufacturers of drugs/indigenous medicine

2. Industry description and Practices

2.1 Hospitals / Nursing homes

The market of hospitals / nursing homes in Sri Lanka mainly consists of a few large scale National hospitals, Private hospitals Divisional small scale national hospitals and nursing homes established and wide spread all over the country.

The National Hospital, Lady Ridgeway Hospital for Children, Castle Street Hospital for Women, Cancer Institute, Kandy National Hospital, Mahamodara and Karapitiya Teaching Hospitals are the leaders among the large scale national hospitals.

Asiri, Nawaloka, Appollo, Durdans etc. stand out among the large scale private hospitals of the Country. Nursing homes also cater to the less complicated illnesses of patients. It is notable that the concentration of the hospitals is in major cities, Colombo being the most prominent. Almost all private hospitals and nursing homes in the Colombo city limits achieve 100% occupancy. Same is the scenario at National hospitals where not all in patients are offered a bed, while surgical procedures and operations are carried out on a waiting list basis.

The Central Bank report for the year 2005 depicts the below findings which clearly emanates the requirement for the expansion and requirement of injecting capital expenditure on the sector.

Description	**Unit**	**2005**
Hospital beds	Per 1000 persons	3.1
Persons per doctor	Number	2168
Nurses	Per 10,000 persons	10.3
Government expenditure on health	Per cent of GDP	1.9
Government Hospitals	Number	606
Private Hospitals	Number	190

2. Present Legal Framework Applicable

(a) Legislation in relation to Environmental Aspects

The main body governing the environmental aspects relating to the health sector is the Central Environmental Authority (CEA). Under the provisions of National Environmental Act No. 47 of 1980 as amended by the Amendments Acts No 56 of 1998 and No 53 of 2000 the prescribed activities for which Environmental Protection License (EPL) is required has been listed under Part "A" and "B" of the schedule of the Gazette notification no.1159/22 dated 22.11.2000.

Activities related to the hospital sector which needs to obtain EPL are as follows;

- Industries involved in manufacturing, extracting or formulating pharmaceuticals or cosmetic products including intermediaries and Industries involved in manufacturing, extracting or formulating Ayurvedic, Indigenous medical products where 25 or more workers are employed - Requires to obtain EPL from Central Environmental Authority

- Incinerators having an input of capacity of less than 5 metric tons per day. – required to obtain EPL from the Local Government Authorities, namely Municipal Councils, Urban Councils and Pradeshiya Sabhas to whom the authority of issuing, monitoring and following up is delegated by CEA.

In addition to the above, CEA has also specified the standards for following;

(i) **General Standards for Discharge of Effluent into Inland Surface waters** – Gazette Notification No. 595/16 dated 02.02.1990 termed as the *National Environmental (Protection & Quality) Regulations No.1 of 1990.* – **Schedule 1**

(ii) **Ambient Air Quality Standards –** Gazette Notification No. 11-193/1, 2A-D 034203 (94/10) dated 05.10.1994 *National Environment (Ambient Air Quality) Regulation* 1994 – **Schedule 2**

(iii) **Permissible Noise Levels** - Gazette Notification No. 924/12 dated 21.05.1996 *National Environment (Noise Control) Regulation No. 1* 1996 – **Schedule 3**

(iv) **Waste Handling Regulations -** Gazette Notification No. 924/13 dated 25.04.1996 *National Environment (Protection & Quality) Regulation No. 1* 1990

(v) **Vibration Control Standard – Schedule 4**

(vi) **Guidelines for Incinerators –Schedule 5**

(b) Legislation in relation to Social Aspects

Legislation applicable to all enterprises and workers including Free Trade Zones whether owned by nationals or non-nationals are governed mainly by;

(i) **Factories Ordinance No. 45 of 1942** - safety and welfare of the factory workers.

(ii) **Shop & Office Employees (regulation of Employment & Remuneration) Act No.19 of 1954 as amended**; - safety and welfare of administrative clerical staff

(iii) **Wages Boards Ordinance No. 27 of 1941 as amended** - prescribe minimum wages and other conditions namely holiday, leave and overtime rates for the relevant trades.

(iv) **Child Labour** -An amendment to the Employment of Women, Young Persons and Children Act (No. 47), 1956.
The minimum age for employment of children was raised from 12 to 14 years in December 1999. At present, the minimum age of employment in all sectors other than the plantation sector is 14 years. Further, through the Ministry of Labour, the legislation has been amended to provide for payment of compensation to victims, by employers violating the minimum age of employment laws.

(v) **Forced Labour** - No employer shall use any form of forced or compulsory labor.

(vi) **Equal Status -** Male and Female workers shall be accorded equal opportunity in employment and occupation and paid equal remuneration for work of equal value.

(vii) **Compulsory Education** -Education Ordinance of 1940,
Compulsory School Attendance, education and attendance at school were made compulsory for every Sri Lankan child aged between 5 and 14 years.

(viii) **Registration of a Factory** - *Factories Ordinance No.45 of 1942 as amended Section 126(1)*
Defines a Factory as a premises which employees are employed in manual labour. This requires a Factory to be registered and it would be an offence to be the occupier of any factory unless such factory is registered and licensed.

(ix) **Overtime -** Under the same Ordinance in c) above,
Previsions are available for overtime employment of women and young persons who are above sixteen but less than eighteen provided that the overtime worked by a woman shall not exceed in aggregate sixty hours in any calendar month and overtime worked by a young person (<16>18 years) , shall not exceed in the aggregate fifty hours in any calendar month. It also does not permit engaging the following persons in overtime.

- A pregnant Woman during her pregnancy
- A nursing mother for a period of one year from the birth of the child
- A woman delivered a still born child for a period of three months.

Wages Board Ordinance No 27 of 1941 as amended.

(x) **Provident Fund** - *Employees' Provident Fund (EPF) Act No 15.*
The employer is expected to contribute 12% of the wage/ salary to EPF. The employee has to contribute 8% and it is the obligation of the employer to collect the contributions and remit the contributions to the Central Bank.

(xi) **Trust Fund** - *Employees' Trust Fund (ETF) Act No 46 of 1980 as amended*,
An employer is required to contribute 3% of the employee's total earnings to the ETF. There is no contribution from the employee. This contribution should be made to ETF during 30 days of the wage period ending.

(xii) **Gratuity -** *Payment of Gratuity Act No 12 of 1983*
An employee who has 5 years uninterrupted and continuous service is entitled to gratuity in terms of the above Act. The payment is half month's salary or 14 days wages where he has not been on a monthly salary, per year of service.. This act is applicable if there are more than 15 employees.

(xiii) **Termination –** *Employment of Workmen (Special Provisions) Act No 45 of 1971 (order under section 6D)*

New formula for payment of compensation was introduced under the termination of the above Act.

(xiv) Recruitment and Retirement

The minimum age for recruitment shall be 18 years. The normal age of retirement is age 55 years. However extension beyond 55 years can be granted as the discretion of the management. Persons who have attained the age of 16 years but below the age 18 years can be employed, subject to the following conditions.

- Persons under 18 years cannot be employed for more that 50 hours of overtime during any month.
- Persons under the age of 18 years cannot be employed after 10.00 pm and before 6.00 a.m

Sri Lanka has ratified all eight of the ILO's fundamental conventions reflected in the 1998 Declaration on Fundamental Principles and Rights at Work:
Convention No. 29 on Forced Labor
Convention No. 87 on Freedom of Association and Protection of the Right to Organize
Convention No. 98 on the Right to Organize and Collective Bargaining
Convention No. 100 on Equal Remuneration
Convention No. 105 on the Abolition of Forced Labor
Convention No. 111 on Discrimination (Employment and Occupation)
Convention No. 138 on the Minimum Age for Admission to Employment
Convention No. 182 on the Worst Forms of Child Labor

4. Identification of E&S Risks

Environmental risks

1. **Proper disposal and management chemical / hazardous material / waste specifically the following types of waste which are specific to health sector.**
    a. Infectious waste- Includes waste suspected to contain pathogens (e.g. bacteria, viruses, parasites, or fungi)
    b. Sharps- Includes needles, scalpels, blades, knives, infusion sets, saws, broken glass, and nails etc.
    c. Pharmaceutical waste- Includes expired, unused, spoiled, and contaminated pharmaceutical products, drugs, vaccines, and sera that are no longer needed
    d. Genotoxic waste- Genotoxic waste may have mutagenic, teratogenic, or carcinogenic properties, and typically arises from the feces, urine, and vomit of patients receiving cytostatic drugs, and from treatment with chemicals and radioactive materials.
    e. Radio active waste-Includes solid, liquid, and gaseous materials that have been contaminated with radionuclides.

2. **Emissions to air**
    Sources of air emissions at Heath care facilities may include exhaust air from heating, ventilation, and air conditioning systems, ventilation of medical gases and fugitive emissions released from sources such as medical waste storage areas, medical technology areas, and isolation wards. Emissions may include exhaust from medical waste incineration if this waste management option is selected by the facility.

3. **Incineration**
    Large general hospitals may be equipped with their own incinerator plant, which is the major

source of emissions to air and wastewater. Typically, only a relatively small portion of medical waste should be incinerated, and the need for a hospital waste incinerator should be carefully evaluated against other technologies and techniques for waste management and disposal.

4. **Waste Water (Process Wastewater)**
   Wastewater from Health Care Facilities often has a quality similar to urban wastewater. Contaminated wastewater may result from discharges from medical wards and operating theaters (e.g. body fluids and excreta, anatomical waste), laboratories (e.g. microbiological cultures, stocks of infectious agents), pharmaceutical and chemical stores; cleaning activities (e.g. waste storage rooms), and x-ray development facilities.

Social risks

1. **Exposure to Infections / Diseases**
   Health care providers and personnel may be exposed to general infections, blood-borne pathogens, and other potential infectious materials during care and treatment, as well as during collection, handling, treatment, and disposal of health care waste.

2. **Exposure to Hazardous Materials and Waste**
   Heath care workers may be exposed to hazardous materials and wastes, including glutaraldehyde (toxic chemical used to sterilize heat sensitive medical equipment), ethylene oxide gas (a sterilant for medical equipment), formaldehyde, mercury (exposure from broken thermometers), chemotherapy and antineoplastic chemicals, solvents, and photographic chemicals, among others.

3. **Radiation**
   Occupational radiation exposure may result from equipment emitting X-rays and gamma rays (e.g. CT scanners), radiotherapy machines, and equipment for nuclear medicine activities.

4. **Fire Safety**
   The risk of fire in health care facilities is significant due to the storage, handling, and presence of chemicals, pressurized gases, boards, plastics, and other flammable substrates.

Schedule 1

(a) Effluent standards

1. DISCHARGED STANDARDS BASED ON THE RECEIVING ENVIRONMENT

a) General Standards For Discharge Of Effluent Into Inland Surface Waters

No.	Determinant	Tolerance Limit
1.	Total Suspended Solids, mg/l, max	50
2.	Particle size of total suspended solids	Shall pass sieve of aperture size 850 micro m
3.	pH value at ambient temperature	6.0 to 8.5
4.	Biochemical Oxygen Demand-BOD_5 in 5 days at 20^0 C, mg/l, max	30
5.	Temperature of discharge	Shall not exceed 40^0 C in any Section of the Stream within 25m down stream from the effluent outlet.
6.	Oils and greases, mg/l max	10.0
7.	Phenolic Compounds (as phenolic OH)mg/l. max	1.0
8.	Cyandes as (CN) mg/l, max	0.2
9.	Sulfides, mg/l, max	2.0
10.	Flourides, mg/l, max	2.0
11.	Total residual chlorine mg/l, max	1.0
12.	Arsenic, mg/l, max	0.2
13.	Cadmium total, mg/l, max	0.1
14.	Chromium total, mg/l, max	0.1
15.	Copper total, mg/l, max	3.0
16.	Lead, total, mg/l, max	0.1
17.	Mercury total, mg/l, max	0.0005
18.	Nickel total, mg/l, max	3.0
19.	Selenium total, mg/l, max	0.05
20.	Zinc total, mg/l, max	5.0
21.	Ammoniacal nitrogen, mg/l, max	50.0
22.	Pesticides	Undetectable
23.	Radio active material	
	a. Alpha emitters micro curie/ml	10^{-7}
	b. Beta-emitters micro curie/ml	10^{-6}
24	Chemical Oxygen Demand (COD), mg/l, max	250

Note 1 : All efforts should be made to remove colour and unpleasant odour as far as practicable.

Note 2 : These values are based on dilution of effluents by at least 8 volumes of clean receiving water. If the dilution is below 8 times, the permissible limits are multiplied by 1/8 of the actual dilution.

Note 3 : The above mentioned General Standards shall cease to apply with regard to a particular industry when industry specific standards are notified for that industry.

(b) Ozone Depleting Substances and National Environmental (Ambient Air Quality) Regulations 1994

Ambient Air Quality Standard

Pollutant	Averaging Time*	Maximum Permissible Level		Method of Measurement
		In mg/m3	In ppm	
Carbon Monoxide	8 hr.	10.0	9.0	Non-dispersive infrared spectroscopy
	1 hr.	30.0	26.0	
	Any Time	58.0	50.0	
Nitrogen Dioxide	24 hr.	0.10	0.05	Coloring using Saitzman method or equivalent (gas phase chemiluminescence)
	8 hr.	0.15	0.08	
	1 hr.	0.25	0.13	
Sulfur Dioxide	24 hr.	0.08	0.03	Pararosaniline method of equivalent (pulsed fluorescent method)
	8 hr.	0.12	0.05	
	1 hr.	0.20	0.08	
Ozone	1 hr.	0.20	0.10	Chemiluminescence method or equivalent (UV photometric method)
Lead	Annual	0.0005	-	Hi-volume sampling, wet ashing /atomic absorption or spectroscopy
	24 hr.	0.002	-	
Suspended Particulate Matter(SPM)	Annual	0.10	-	Hi-volume sampling & Gravimetric
	24 hr.	0.30	-	
	8 hr.	035	-	
	3 hr.	0.45	-	
	1 hr.	0.50	-	

* Minimum number of observations required to determine the average over the specified period:

03 hour average – 03 consecutive hourly average
08 hour average – 06 hourly average
24 hour average – 18 hourly average
Yearly average – 09 monthly averages with at least 02 monthly average each quarter.

By wet chemistry methods or by automated analysis.

Schedule 3

(c) National Environmental (Noise Control) Regulations 1996

(Regulation 2)

Maximum Permissible Noise Levels at Boundaries in LAeq'T.

Area	LAeq'T	
	Day time	Night Time
Low Noise	55	45
Medium Noise	63*	50
High Noise	70	60
Silent Zone	50	45

* Provided that the noise level should not exceed 60 dB (A) inside existing houses, during day time.

(Regulation 4)

Maximum permissible Noise Levels at Boundaries of the land in which the source of noise is located in LAeq',T, for construction activities.

LAeq' ,T	
Day time	Night time
75	50

The above maximum noise levels should be maintained inside the boundary of the land, in which the source noise is located.

(Regulation 3)

The following noise levels will be allowed where the background noise level exceed or is marginal to the given levels in Schedule 1.

a) For low noise areas in which the background noise level exceed or is marginal to the given levels	Measured Background Noise level + 3 dB (A)
b) For medium noise areas in which the Background noise level exceeds or is Marginal to the given level	Measured Background Noise level + 3 dB (A)
c) For silent zone in which the background Noise level exceeds or is marginal to the Given level	Measured Background Noise level + 3 dB (A)
d) For high noise areas in which the background noise level exceeds or is marginal to the given level	
For day time	Measured Background Noise Level +5 dB (A)
For Night time	Measured Background Noise Level +3 dB (A)

(Regulation 7 (a)

Maximum permissible Noise levels at Boundaries in LAeq ,T, for industrial activities.

	LAeq', T	
Areas	**Day time**	**Night time**
Rural Residential Area	55	45
Urban Residential Area	60	50
Noise Sensitive Area	50	45
Mixed Residential	63	55
Commercial Areas	65	55
Industrial Area	70	60

(Regulation 7 (b))

The following noise levels will be allowed in places where the background noise levels exceed or is marginal to the given levels in Schedule 1 :-

a. For rural residential areas in which the background Noise level exceeds or marginal to the given level	Measured Background Noise Level +3 dB (A)
b. For noise sensitive areas in which the background noise level exceeds or is marginal to the given level	Measured Background Noise Level +3 dB (A)
c. For noise sensitive areas in which the background Noise level exceeds or is marginal to the given level	Measured Background Noise Level +3 dB (A)
d. For mixed residential or commercial areas in which the background noise level exceed or marginal to the given level	
(i) For day	Measured Background Noise Level +5 dB (A)
(ii) For night time	Measured Background Noise Level +3 dB (A)
e. For industrial areas in which the background noise level exceeds or is marginal to the given level	
(i) For day	Measured Background Noise Level +5 dB (A)
(ii) For night time	Measured Background Noise Level +3 dB (A)

(Regulation 7 (c))

Area	LAeq' T	
	Day time	Night Time
Industrial/Commercial	75	60
Urban/Rural/Mixed Residential	65	50

Schedule 4

(d) Vibration Control

2. Interim Standards for Vibration Control

Table 2.1: Interim Standards for vibration of the Operation of Machinery, Construction Activities and Vehicle Movements Traffic

Category of the structure as given in Table 1.1	Type of Vibration	Frequency of Vibration (Hz)	Vibration in PPV (mm/Sec.)
Type 1	Continuous	0 – 10	5.0
		10-50	7.5
		Over 50	15.0
	Intermittent	0 – 10	10.0
		10 –50	15.0
		Over 50	30.0
Type 2	Continuous	0 - 10	2.0
		10-50	4.0
		Over 50	8.0
	Intermittent	0 – 10	4.0
		10 –50	8.0
		Over 50	16.0
Type 3	Continuous	0 - 10	1.0
		10 - 50	2.0
		Over 50	4.0
	Intermittent	0 - 10	2.0
		10 – 50	4.0
		Over 50	8.0
Type 4	Continuous	0 - 10	0.25
		10 – 50	0.5
		Over 50	1.0
	Intermittent	0 – 10	0.5
		10 - 50	1.0
		Over 50	2.0

Notes

1. Please see separate measurement methods
2. The values given above are in such a way that minor damage is unlikely as the nearby house/building

Multifying Factors Use to Specify Magnitudes of Building Vibration with Respect to Human Resource Using The Base Curve

Table 3.2 Multiplying factors use to specify magnitudes of building vibration with respect to human resource using the base curve in Table 3.1

Place	Time	Multiplying factors		
		Continuous vibration (day time and night time)*	Impulsive vibration (max. of three occurrence per day	Intermittent vibration
Critical working areas (e.g hospital operating theatres, precision laboratories	Day	1	1	1
	Night	1	1	1
Residential	Day	6	40	20
	Night	2	10	5
Office	Day	6	80	30
	Night	6	80	30
Workshop	Day	8	100	50
	Night	8	100	50

Note: * "day time" from 0600 h to 1800h
"night time" from 1800h to 0600h

Table 3.3: Interim standards on vibration for the inconvenience of the occupants in buildings

Place	Time	Multiplying factors		
		Continuous vibration (day time and night time)*	Impulsive vibration (max. of three occurrences per day	Intermitted vibration
Critical working areas	Day & Night	0.141	0.141	0.141
Residential	Day Night	0.705 0.282	5.640 1.410	2.820 0.705
Office	Day & Night	0.846	11.280	4.230
Workshop	Day & Night	1.41	1.41	7.05

Note * " day time" from 0600 to 1800h
" night time" from 1800h to 0600h

All values are frequency weighted to vertical axis

1.2.3 Guidelines for Incinerators

Incinerators are possible to be used in certain situations that arise in operations such as medical waste management etc. The following set of standards/guideline is forwarded as minimal criteria for such situations. However, it is cautioned that the system is selected always after considering all other options systematically.

Parameter / Incinerator Type	Modular Excess Air and Starved Air Incinerator	Mass Burn Incinerator
Minimum incineration temperature	1000°C at fully mixed height	1000°C determined over all design review
Minimum residence	1 second after final secondary air injection ports	1 second calculated from where most of combustion has been completed
Primary Air	Utilize multi-port injection to minimize waste distribution	Use multiple plenums with individual air flow control
Secondary Air	Up to 80% of the total air required	At least 40% of total air
Auxiliary burner capacity	Secondary burner 60% of total rated heat capacity and that required to meet start up and part load temperature	60% of total output and required to meet start up load temperature
Oxygen level at the incinerator outlet	6 to 12%	6 to 12%
Turndown restrictions	80 to 110% of designed capacity	80 to 110% of designed capacity
Maximum CO level	55 mg/Nm^3 @ 11%O_2 (4hr rolling average)	55 mg/Nm^3 @ 11%O_2 (4 hr to average)
Combustion efficiency	99.99 (8 hr rolling average)	99.9% (8 hr. rolling average)
Emission Control System		
Flue gas temperature at inlet or outlet at emission control device	Not to exceed 140°C	Not to exceed 140°C
Opacity	<10%	<10%

Where N means the values are expressed at Normal Conditions of 0°C temperature, 1 bar (760 mmHg) pressure and dry (zero moisture).

SECTOR STUDIES

COMMERCIAL SERVICES SECTOR (PRINTING & PACKAGES)

1. Sub Categorization

a) Publishing
   i. Newspapers & Magazines
   ii. Books

b) Commercial Printing
   i. Bills, Posters and handouts
   ii. Greeting Cards
   iii. Diaries and Other stationery items
   iv. Security Printing – Lotteries, Currency and Telephone Cards etc.

c) Packaging Material
   i. Manufacture of Boxes & Cartons – Paper based products
   ii. Manufacture of wrapper Bags/Covers – Polythene & Plastic bags
   iii. Manufacture of PET Bottles and containers – Plastic products
   iv. Manufacture of Plastic & Polymer Boxes
   v. Manufacture of Sacks – Sand Bags, Commodity Bags (Sugar, Rice etc)
   vi. Manufacture of Tins/Cans

d) Packaging accessories
   i. Tags & Label printing

e) Support Services
   i. Type Setting
   ii. Designing & Page Make up
   iii. Binding

1.1. Type setting, page making and binding facilities, which are considered as supporting services in the process of printing and packaging manufacturing, are sometimes offered as separate services by small/micro level players. Majority of the medium/large scale players operate in house facilities to provide these services. Large players are also capable of manufacturing few of the above products within a single operation (Ex. A paper based carton or box manufacturer can be diversified into manufacture of labels, tags, greeting cards, security printing, books etc., using the same operation and machinery).

2. Industry Description and Practices

(a) ***Industry Overview***

2.1. Printing and Packaging industry in Sri Lanka is highly diverse and viewed as a total service industry. There are more than 4,000 enterprises of varying scale operating in the country employing more than 40,000 people. Two schools, viz., Sri Lanka Institute of Printing and the Ingrin Institute of Printing & Graphic Arts cater to the local training requirements of the industry.

2.2. Approx. 90% of cartons, boxes, labels and tags produced in the country are indirectly exported. Furthermore, Sri Lankan manufacturers are competitive enough to win overseas orders for cartons and boxes (direct exports).

Industry in general is capital intensive and requires highly skilled labour force to operate and maintain sophisticated machinery and equipment. Main raw materials include paper, ink, films, pre sensitized plates and other chemicals.

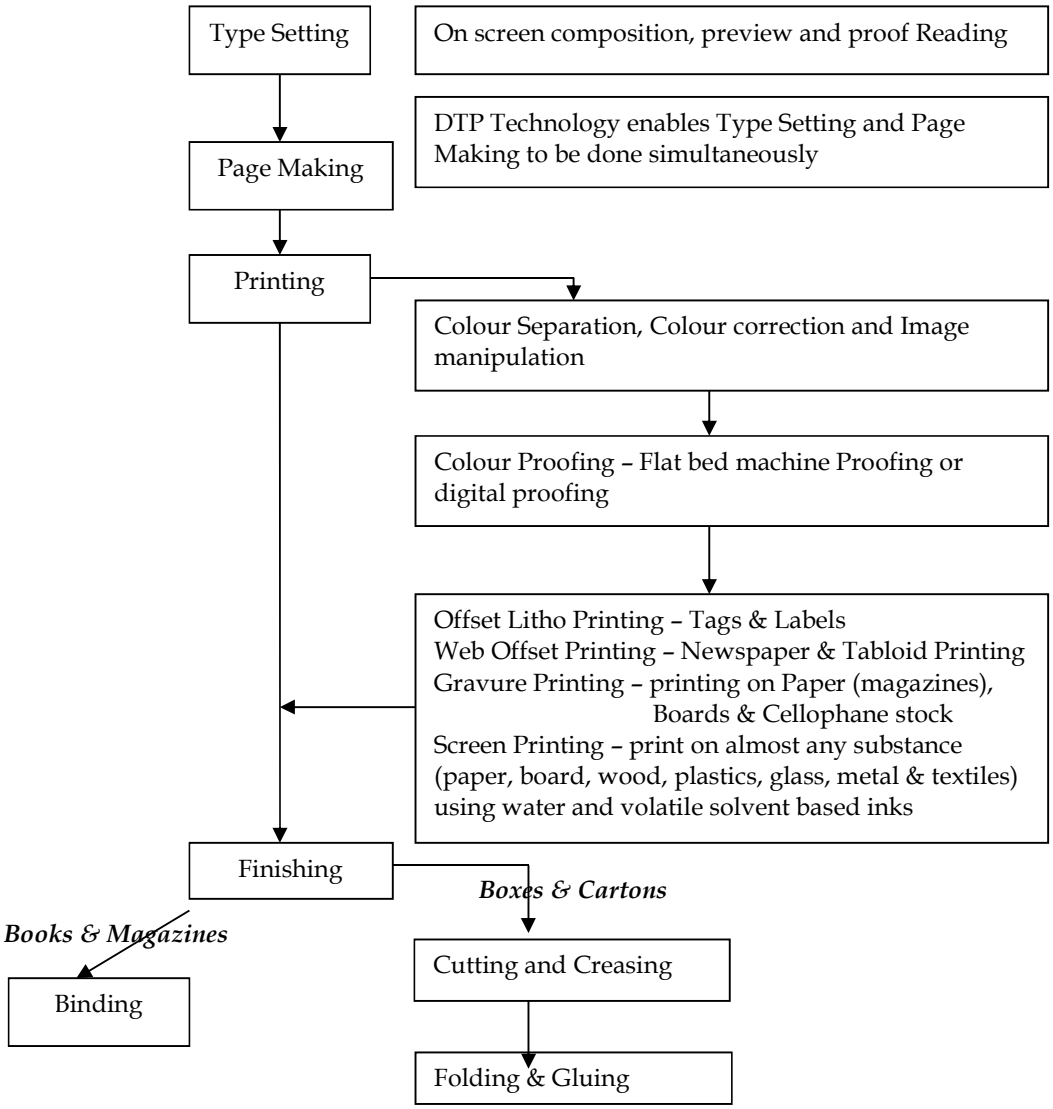
(b) ***Industry Practices***

2.3. Despite the diverse product range within the industry, industry practices adopted by the suppliers using a particular type of packaging material (ex. Paper, plastics, polythene, tin etc) are more or less similar. Following describes the practices adopted by

a) paper based Printing & Packaging industries and
b) Polythene based Printing & Packaging industries only.

Practices adopted by Plastic, Polymer and tin based Printing & Packaging industries are not addressed in this review as the Bank currently does not have any exposures to these segments.

2.4. Industry practices adopted by paper based printing and packaging industries

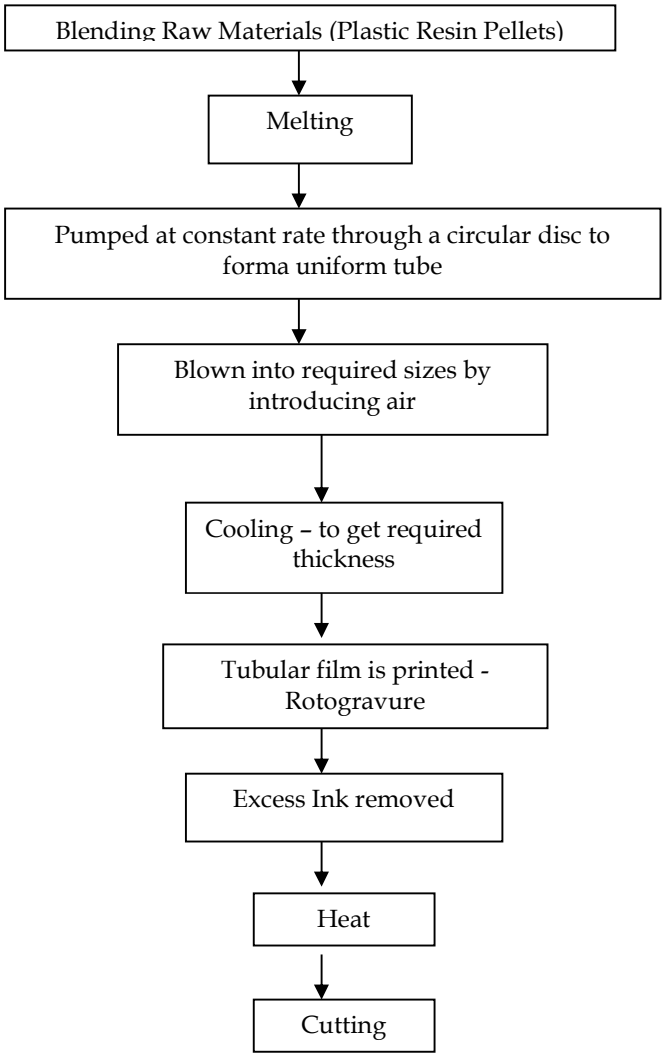


2.5. Once the colour separation, proofing and corrections are done, the picture or the page to be printed is converted to a printing form, a printing block (in high intensity flexography), a plate (in offset printing) a roller (in Gravure printing) or a stencil (in Screen Printing). This is done by means of exposure to a light sensitive coating. In the case of offset and screen printing, the form is developed by washing away part of the coating. The offset plate is coated with rubber to protect it from oxidation. The screen sheet's sides are masked with protective paint.

2.6. In gravure printing, the small grooves in the gravure roller are etched or engraved and the surface is chromed for better durability. The rubber printing block in flexographic printing is cast or engraved by laser. The dyeing agent in most cases is a solvent that evaporates from the paper. Clear varnish is sometimes added to the printed surface.

2.7. In laminating the end product layers of paper, plastics and metal foil are joined. Plastic surfaces are treated to facilitate printing using electrical discharges from an electrode system, the "corona treatment".

2.8. Industry practices adopted by polythene based printing and packaging industries



2.9. Raw materials used in the process include plastic resin pellets such as Low Density Polythene (LDPE), Linear Low Density Polythene (LLDPE), High Density Polythene (HDPE) and

Polypropylene (PP) and additives such as Ink and Solvents. LDPE and LLDPE are used to manufacture thinner bags whilst HDPE is used to manufacture products with more strength and stiffness.

3. Present Legal Framework applicable

3.1. The present legal framework that regulates the industry can be broadly sub divided into following areas.

a) Formation/incorporation of companies
b) Day to day operation of the companies within the industry
c) Pollution control and environmental protection

3.2. Detailed below are the minimum requirements and applicability of the main regulations under each of the above categories.

Area	Legal Framework	Minimum Requirement	Applicability
Company Formation	Companies/ Sole Proprietor Act	Registration of the company/ Sole Proprietorship	To all companies and sole proprietorships
	BOI Regulations	BOI approval for the setup of the company	Only for companies seeking concessions under BOI agreement.
Day to day operation of the company	Shop & Office Act	Adherence to the requirements	All companies
	Wages Board Ordinance	Adherence to the minimum wages applicable to the classes of employees within the industry	All companies
	Local Authority Approvals	Obtaining Street line certificates Non vesting certificates Approvals for building plans	Prior to construction of buildings/factories
Pollution Control & Environment Protection	Central Environmental Authority Regulations		
	National Environment Act No 47 of 1980 as amended by Act No 56 of 1988 & Act No 53 of 2000	Obtaining Environment Protection License (EPL)	Printing presses with lead smelting
	National Environmental (Protection & Quality) Regulations No 1 of 1990	Adherence to Waste Water Discharge standards based on the receiving environment.	All companies
	National Environmental (Noise Control) Regulations No. 01 of 1996	Adherence to the regulation. Please refer ***Schedule 1*** for details	All companies
	National Environment (Protection & Quality) Regulation No. 1 1990	Adherence to waste handling regulations	All companies

	National Environment Act No. 47 of 1980 - Order under Section 23W (Gazette No. 1466/5 of October 10, 2006)	Manufacture, sale or use of polythene or any polythene product of 20 microns or below in thickness is prohibited.	Any company

Schedule 1

Permissible Noise Levels - National Environment (Noise Control) Regulation No. 1 1996

(Regulation 2)

Maximum Permissible Noise Levels at Boundaries in LAeq'T.

Area	LAeq'T	
	Day time	Night Time
Low Noise	55	45
Medium Noise	63*	50
High Noise	70	60
Silent Zone	50	45

* Provided that the noise level should not exceed 60 dB (A) inside existing houses, during day time.

"LAeq 'T' means the equivalent continuous, A- weighted sound pressure determined over a time interval T(in dB).

(Regulation 3)

The following noise levels will be allowed where the background noise level exceed or is marginal to the given levels in Schedule 1.

a) For low noise areas in which the background noise level exceed or is marginal to the given levels	Measured Background Noise level + 3 dB (A)
b) For medium noise areas in which the Background noise level exceeds or is Marginal to the given level	Measured Background Noise level + 3 dB (A)
c) For silent zone in which the background Noise level exceeds or is marginal to the Given level	Measured Background Noise level + 3 dB (A)
d) For high noise areas in which the background noise level exceeds or is marginal to the given level	
For day time	Measured Background Noise Level +5 dB (A)
For Night time	Measured Background Noise Level +3 dB (A)

The above maximum noise levels should be maintained inside the boundary of the land, in which the source noise is located.

4. Identification of Environmental & Social Risks

(j) Environmental Risks

4.1. **Risk of air pollution due to emission of volatile organic compounds**

Emissions generated in the printing industry constitute approximately 98%-99% of toxic releases. The most significant sources of volatile organic emissions in printing result from evaporation of the fountain (e.g. isopropyl alcohol and ethanol) and cleaning (e.g. organic solvents) solutions that are used in pressrooms. Also, significant emissions may be generated from lacquering with solvent-based lacquers and from laminating with solvent-based adhesives. Other sources of volatile organic compounds include binding, laminating, coating, and drying operations as well as cleaning, ink storage & mixing and press proofing.

4.2. **Risk of air and water pollution due to emission of other toxic compounds**

Galvanic, chromium-plating, and dechroming baths in gravure printing cylinder-making may be sources of emission of some toxic compounds including hexavalent chromium, hydrochloric acid and isocyanates.

4.3. **Risk of soil pollution due to particulate Matter**

Paper slitting, folding, and cutting operations generate particulate matter(paper dust) which can cause soil pollution.

4.4. **Risk of air pollution due to combustion By-Products**

Printing machines may have boilers and/or thermal fluid heaters to produce heat for certain processes, such as in flexography.

4.5. **Risk of ground water systems being contaminated by wastewater released by printing industry**.

Wastewater sources in the printing industry are typically associated with photo ad plate processing activities. Prepress/imaging operations with photographic films, now largely out of use, involve light-sensitive salts, alkaline or acid baths, and other chemicals used in black and white printing (e.g. n-hexane, sodium thiosulfate, ammonia, hydroquinone, diethanolamine, and zinc compounds).

Wastewater from the industrial process may contain metal compounds (e.g. silver and mercury) and cleaning solutions may contain pigments, acids, and solvents (e.g. toluene)

Prepress/ imaging liquid wastes consist of spent developers, used rinse/wash water, and spent fixers, resulting from treatments to cover chemicals such as silver. The rinsing water from developing stencils in screen printing contains reactive acrylates, is toxic to aquatic organisms, and may cause nitrification effects.

4.6. **Risk of soil and ground water pollution by emission of liquid and solid waste**.

Liquid waste from the press may include ink residues (containing zinc, chromium, barium, lead, manganese, benzene, dibutyl, ethyl acetates); wastes from fountain and cleaning solutions (e.g. spent organic solvents, including trichloroethane, methylene chloride, carbon tetrachloride, acetone, and methanol); and other solvents and container residues(e.g. toluene, xylene, glycol ethers, Methyl ethyl ketone, and ethanol).

Water-based inks may contain biocides and photo initiators. Post-press waste may include zinc, barium, and cadmium from waste paper, and n-hexane, methanol etc. Solid wastes may include waste paper and other substrates, exhausted printing plates, cylinder-etching operation waste, rags, containers and packaging.

4.7. **Inhalation Hazards**

Inhalation of potentially hazardous chemicals may occur at any stage of the printing process where alcohols or solvents evaporate into the work environment or more specifically through the generation of ozone produced by UV lamps or from corona treatment of plastic film surfaces. An additional source of inhalation exposure is the different types of dust generated at some stages of the printing process.

4.8. **Fire Hazards**

Anti-offset powder, used mainly in sheet-fed offset presses, is a very fine, nontoxic powder that is emitted from the final roller. This powder contains maize starch, calcium carbonate, and tripolite. It may settle on exposed surfaces in the press room, and is classified as a nuisance dust with potential for explosion. In addition, this constitutes a potential health hazard.

4.9. **Noise pollution**

Printing industry machinery, including ventilation systems, may result in continuous or intermittent souses of noise.

(k) Social Risks

4.10. **Child Labour** – Abuse of child labour.

4.11. **Forced labour** - Risk of using forced labour and the risk of not having proper disciplinary practices.

4.12. **Discrimination** - Possibility of discrimination at work place.

- Does the company has a policy/regulation to prevent discrimination?
- What is the company policy on maternity leave?
- Do employees have a confidentiality counselor for sexual or other harassment?

4.13. **Remuneration**

- Does the company follow Wages Board Ordinance in deciding the minimum wages to be paid ?

4.14. **Dermal Contact Hazards**

The use of hazardous materials in printing may generate exposure hazard for workers through direct skin contact with liquid or solid hazardous/ corrosive substances (e.g. vapors and/or sprays). Exposure may occur in the prepress phase.(e.g. acid baths for film developing and hand correction of lithoplate). Other potential sources of exposures include isopropyl alcohol in fountain solution and press-cleaning solvents, non water-based inks, and UV-cured inks during the press and post-press phases.

4.15. **Health and Safety**

- Does the company has a written Occupational Health and Safety program in place?
- Does the company comply with the health and safety standards laid down by the Factories Ordinance and Shop & Office Ordinance?
- Does the company has an emergency Preparedness & Response Plan in place? Has this been communicated to every level of staff.
- Are all electrical installations properly earthed /insulated /watertight/explosive- proof.
- What measures has been taken to deal with the risk of fire.
- What measures will be taken to deal with the risk of explosions and in relation to the occurrence and handling of dust, volatile flammable etc.
- What preventive and/or protective measures have been taken to safeguard machinery and other equipment used by employees.

- What preventive and/or protective measures have been taken to prevent exposure of employees to pressure and/or electromagnetic field/ radiation.
- Are workers given gloves, masks, goggles etc
- Are workers trained adequately to handle hazardous substances such as chemicals.
- What preventive and/or protective measures will be taken to prevent contact substances that pose a health hazard (inhalation, potential eye damage, skin contact etc).
- Are the available sanitary facilities adequate?

4.16. **Risk of publishing phonographic and discriminatory publications**.

4.17. **Resettlement** – Is there a risk of unsatisfactory resettlement arrangements?

4.18. **Relocation** – Is there a risk of relocation due to unavailability of land for expansion or the land being located in a residential area?

Annex III
Part iv

SECTOR STUDIES

ENERGY SECTOR

1. Introduction- Key Sector Highlights

1.1. A reliable and uninterrupted supply of electricity is a pre-requisite for rapid industrialization and economic growth. The demand for electricity grows at around 8% annually. However, during the first eight months of 2007 electricity grew at a relatively lower rate of 4 % to 6,495 GWh . Thermal Power generation increased by 16% to 4,056 GWh, while hydropower generation decreased by 12% to 2,437 GWh. System losses still remain high at 16.3%.

1.2. The CEB holds an absolute monopoly over the power sector in SL. However, the financial position of CEB has been weak for the past several years. The operating losses of CEB are expected to be around Rs. 45 Bn for the years 2008. It has been observed that expediting the planned low cost power generation, improving financial and operational management of the power sector and the introduction of a tariff policy which is cost based will be important factors in reviving the financial position of the CEB.

1.3. The construction of work of several power projects is in progress. The 300 MW Kerawalapitiya thermal power plant is scheduled to commence in mid 2008. The 150 MW Kotmale Hydro Project commenced in 2007, as did the 300 MW Norochcholai coal power plant.

1.4. The Government of Sri Lanka has decided to implement regulatory reforms in the power sector to ensure sustainable development. The regulation of the Power Sector is to be entrusted with the Public Utilities Commission of Sri Lanka (PUCSL). All necessary arrangements will be taken to implement the PUCSL's recommendations within g the existing institutional structure of the power sector to facilitate regulation and to drive performance improvements.

1.5. The NDB's exposure to the energy sector is approximately Rs. 1.2 Bn and is 1% of the total exposure of the Bank.

2. Sub-sector categorization

2.1. The Energy Sector can be sub categorized in to the following:

- Hydro Power
- Mini Hydro Power
- Thermal Power
- Bio Mass
- Wind Power
- Solar Power

2.2. NDB has primarily lent to the mini hydropower sector and the thermal power sector. The current exposure is Rs 1,112 Mn and Rs. 110 Mn respectively. As NDB's exposure has primarily been to these two sub-sectors the process flow described will be for these two sub-sectors only.

(A) Mini-Hydro Power Sub-sector

Pre-Construction Process

2.3. ***Identification of Site*** - identification of potential site for hydropower generation. Especially the land layout for the project in terms of wier diversion point, intake channel, forebay tank and the powerhouse.

2.4. ***Hydrology Study*** –Undertake a study to collect and analyse the rainfall data at the site. Data collated by rainfall stations at the site or at a station in close proximity to the site is used for the analysis.

2.5. ***LOI***- Letter of Intent given to the developer by the CEB to proceed to conduct a feasibility study and to obtain all other approval required for the construction and eventual operation of the project.

2.6. ***Acquisition of Land –*** The purchase of land required for the construction of the project. Purchase is usually made out right by private parties or leased out by the government to the project developers on a long term basis.

2.7. ***CEA*** *Clearance* –Central Environmental Authority will grant its clearance after a comprehensive environmental questionnaire is filled out and filed by the developer.

2.8. **Pradeshiya Sabha/Divisional Secretary's clearance** - Obtaining approval to construct the project within the jurisdiction of the local authority of the area.

2.9. **Irrigation Department Clearance –** Approval granted for the construction of the project as no existing irrigation scheme is within the stretch of the stream affected by the project and as there are no plan to utilize the water of the same for irrigation development.

2.10. **National Water Supply and Drainage Board clearance-**Approval granted for the use of water rights fro the project.

2.11. **Generation License –** license granted by the Energy Supply Committee to build, own operate and maintain a mini hydro project.

2.12. **Power Purchase Agreement-** executed between CEB and the project developer. The terms of conditions governing the production, sale and price of energy is set out in this agreement. The PPA could be executed anytime prior to commissioning.

Construction and Commission Process

2.13. **Mobilization** – Setting up of the engineering and construction team at the construction site

2.14. **Access Roads** – Clearing of the project site to establish access roads. This is essential not only personnel working on the construction but also for the purposes of transporting goods for construction.

2.15. **Electro- Mechanical Equipment** – Establishing Letters of Credit for the procurement of EME. The process of making the EME only commences once the LC's have been established. The gestation period takes between 10 months to a year depending on the complexity of the project.

2.16. **Civil Works** – construction of all civil structures such as the channel, penstock anchor blocks and supports, forebay tank and power house essential elements of the project.

2.17. **Installation of EME** – at the conclusion of the construction of the civil structures the EME is installed in the powerhouse

2.18. **Transmission Lines** – Construction of the transmission lines and connection to grid substation

2.19. **Testing and Commissioning** - Period of testing is undertaken when all the elements of the structure, equipment and transmission lines are tested. Upon, successful testing CEB gives the go ahead to commission the project.

(B) Thermal Power Sector

Pre-Construction Phase

2.20. **Identification of Site** - identification of potential site for the power plant.

2.21. **Acquisition of Land –** The purchase of land required for the construction of the project. Purchase is usually made out right by private parties or leased out by the government to the project developers on a long-term basis. Clearing of title etc…

2.22. **Pradeshiya Sabha/Divisional Secretary's clearance** - Obtaining approval to construct the project within the jurisdiction of the local authority of the area.

2.23. **BOI** – Obtaining of BOI clearance and entering in an agreement with the BOI for the setting up an operations of the project

2.24. **Generation License –** license granted by the Energy Supply Committee of the Ministry of Power and Energy to build, own operate and maintain the power plant.

2.25. **Environmental Impact Assessment-** Environmental clearance for the setting up of the project granted by the environmental division of the relevant provincial council.

2.26. **Coast Conservation Department–** Depending on the location of the plan, (coastal areas) approval will be required to transport heavy equipment and for purposes of unloading same.

2.27. **Power Purchase Agreement-** executed between CEB and the project developer. The terms of conditions governing the production, sale and price of energy is set out in this agreement. The PPA could be executed anytime prior to commissioning.

Construction and Commissioning Process

2.28. The above process involves the following

1. Land development and site preparation.
2. Entering in to Engineering Procurement and Construction contracts with a turnkey contractor.
3. Entering in to an operation and maintenance contract with an O & M contractor
4. Entering in to an Implementation Agreement with the GOSL
5. Entering into Insurance agreements. Insurance will cover insurance during construction/Post construction insurance and the lenders' insurance requirements.
6. Entering in to fuel supply agreements with fuel supplier.
7. Civil construction of the site to house the EME

8. Installation of the equipment and erection of transmission lines
9. Testing and Commissioning

(C) Wind Power Sector

Pre-Construction Phase

2.29. ***Identification of Site*** - Identification of a suitable site for the power plant.

2.30. ***Acquisition of Land –*** The purchase of land required for the construction of the project.

2.31. ***Divisional Secretary's clearance*** - Obtaining approval for project construction.

2.32. ***BOI – Obtaining BOI clearance and entering into an agreement with the BOI for the operations of the project***

2.33. ***Environmental Clearance-*** Environmental clearance for the setting up of the project

2.34. ***Geo-technical Investigations***- To ascertain the suitability of the site

2.35. ***Power Purchase Agreement-*** executed between CEB and the project proponent. This sets out the framework for energy sales. This will include basis for determination of future tariff.

Construction and Commissioning Phase

2.36. The above process involves the following

1. Land development and site preparation.
2. Entering into Equipment Supply, Erection, Commissioning and Technical Supervision contracts.
3. Civil Construction Work
4. Electrical Construction Work
5. Setting up mechanisms for Equipment Transportation
6. Entering into Insurance agreements. Insurance will cover insurance during construction/Post construction insurance and the lenders' insurance requirements.
7. Testing and Commissioning

3. Legal and Regulatory Framework

3.1. As mentioned above certain clearances have to be obtained to commence the construction of a mini hydropower project. They are as follows:

- Letter of Intent
- Central Environmental Authority Clearance
- Pradeshiya Sabha approval
- Divisional Secretary's clearance
- Irrigation Department Clearance
- National Water Supply and Drainage Board clearance
- Generation License
- Power Purchase Agreement
- BOI approval and agreement

- Coast Conservation Department Clearance
- Environmental Impact Assessment

3.2. Sri Lanka legislation applies to all enterprises and workers in Sri Lanka. Enterprises engaged in power generation are governed primarily by -

(a) Wages Board Ordinance No 27 of 1941 as amended.
(b) Holidays Act No 29 of 1971
(c) Employees Provident Fund Act No 15
(d) Employees Trust Fund Act No 46 of 1980 as amended
(e) Payment of Gratuity Act No 12 of 1983 as amended
(f) Termination of Employment of Workmen Special Provisions Act No 45 of 1971
(g) Shop & Office Employee (Regulation of Employment and Remuneration) Act No 19 of 1954 as amended.
(h) National Environmental Act (Amendment) No 56 of 1988– Tolerance Limits for power sector in to the Inland Surface Waters Annex ii
(i) Gazette Notification No 924/12 dated 23.05.1996 as termed National Environmental (Noise Control) Regulations No. 01 of 1996
(j) National Environmental (Protection and Quality) Regulations No1 of 1990

SCHEDULE A

BRIEF REGULATORY LABOUR GUIDELINES

(a) Factories Ordinance No 45 of 1942 as amended

Section 126(I) defines a Factory in the following broad terms :

A factory means any premises in which persons are employed in manual labour in any process for or incidental to any of the following purposes :-

(a) the making of an article or any part of an article; or
(b) the altering, repairing, ornamenting, finishing, cleaning or washing or breaking up or demolition of any article; or
(c) the adapting for sale of any article.

The definition also covers work close to such premises or within the precincts or curtilage of which work is carried on **by way of trade or for the purposes of gain** and **to or over which the employer of the persons employed has the right of access or control**.

(b) Wages Board Ordinance No : 27 of 1941 as amended

Wages Boards under the Wages Boards Ordinance as amended is a method of prescribing minimum wages and a few other conditions such as holidays, leave and overtime rates for the relevant trades.

Wages are fixed by Wages Boards on the basis of tripartite discussions and voting at meetings of the relevant Board. Where a monthly rate has been determined an employer can still place workers on a piece rate but he would have to ensure that the minimum monthly rate is paid to the employee.

Any employee called upon to wait for work is entitled to payment of his full wages for that period. However, this does not apply to employees who are present on the premises by reason only of the fact that they reside on the premises of the employer.

Wages have to be paid within 3 days of the expiry of the wage period if the wage period does not exceed one week; if the wage period is 2 weeks within 5 days; and where the wage period is one month within 10 days of the expiry of the month.

(i) Weekly Holidays, Section 24

Every employer shall allow each Sunday as the weekly holiday to all workers employed under him. Provided, however, that an employer may employ any worker on such Sunday subject to the following conditions :-

(1) That a day within six days next succeeding such Sunday shall be allowed to that worker as a holiday; and
(2) That in respect of work done on a Sunday that worker shall be paid as remuneration :-

    (a) The minimum rates of wages for normal working days (ascertained by dividing the monthly rate by 26) increased by 50 percentum of such minimum rate for the first 9 hours (inclusive of one hour for a meal or rest); and
    (b) 100 percentum of the minimum hourly rate (ascertained by dividing the minimum monthly rate by 200) for each subsequent hour of work.

(3) The remuneration due to a worker for work done on a Sunday during any period shall be paid along with the wages payable for that period.

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(ii) Annual Holidays, Section 25

(1) If a worker has been in continuous employment and has worked under the same employer for more than 218 days in any year (hereinafter called the "qualifying year") he shall be allowed in the next succeeding year a holiday or holidays, calculated at the rate of one holiday for each unit of 4 days by which the number of days on which the worker has worked exceeds 218 days.

Provided, however, that it shall not be obligatory on an employer to allow any such holiday in respect of any period of work in excess of 274 days.

In this paragraph "days on which a worker has worked" includes :-

(a) every holiday allowed by the employer that worker under Section 25 of the Wages Boards Ordinance (Chapter 136), in any year under consideration;
(b) every day of absence on any grounds approved by the employer;
(c) every day of absence due to any injury to the worker caused by an accident arising out of and in the course of his employment;
(d) every day of absence due to any occupational disease specified in Schedule II of the Workmen's Compensation Ordinance (Chapter 139);
(e) every day on which the employer fails to provide work for the worker and
(f) every day of absence due to a strike or lockout that is not illegal and that does not continue for more than 30 days; but shall not include the day fixed as the weekly holiday under Section 24.

(2) (i) If the number of holidays that a worker is entitled to does not exceed seven, such worker shall be allowed, and he shall take those holidays on consecutive days.
(ii) If the number of holidays that a worker is entitled to exceeds seven, such worker shall be allowed, and he shall take seven of those holidays on consecutive days.

(3) a worker shall be allowed his holidays on a day or days to be mutually agreed upon between him and his employer.

(4) The remuneration for each holiday shall be the average daily wage of the worker obtained by dividing the total wage (excluding overtime and bonuses) earned by the worker for the days on which he has actually worked in the last 60 days of the qualifying year by the number of such days.

(5) The remuneration due to a worker in respect of his holiday or holidays shall be paid to him before such holiday, but not earlier than seven day before such holiday or holidays.

(c) Holidays Act No : 29 of 1971

Public Holidays – Section 25

1. (a) Subject to the provisions of the act, every employer shall allow as holidays with remuneration to all workers employed by him the following public holidays within the meaning of the Holidays Act No: 29 of 1971;

(1) The Tamil Thai Pongal day
(2) National Day (4th February)
(3) The day immediately prior to the Sinhala and Tamil New Year day.
(4) The Sinhala & Tamil New Year Day
(5) May Day (1st May)

(6) The day immediately following the Full Moon Poya Day of the Sinhala month of Wesak.
(7) Milad-un-Nabi (Holy Prophet's Birthday)
(8) Christmas Day

The above list contains only 8 public holidays, which are not bank holidays, whereas the list of public and bank holiday for all purposes contains 26 such holidays. However this list does not include June 30th and December 31st which are special bank holidays.

(b) The provisions of sub-paragraph (a) of this Paragraph shall not apply to a worker in any case where a public holiday referred to in that sub-paragraph occurs during any period when such worker is on strike.

(a) The remuneration payable to a worker for each such holiday as is referred to in the preceding sub-paragraph (a) shall be not less than the minimum rate of wages payable for a normal working day in the month in which such holiday occurs.

2. An employer may employ any worker on any such public holiday as is referred to in the preceding paragraph subject, however, to the following conditions :-

(a) A day on or before the thirty first day of December next succeeding such public holiday shall, be granted to the worker as a holiday with remuneration at not less than the daily minimum rate of wages (ascertained by dividing the monthly rate by 26) payable for a normal working day of the month in which the alternative holiday is granted, or

(b) Such worker shall be remunerated for work done on any such public holiday at not less than double the minimum daily rate of wages (ascertained by dividing the monthly rate by 26) for work done during the number of hours constituting a normal working day and at not less than three time the normal hourly rate (obtained by dividing the monthly rate by 200) for work done during each year (and proportionately for work done for part of such hour) in excess of the number of hours constituting a normal working day."

(d) Employees' Provident Fund (EPF) ACT No : 15

The employer is expected to contribute 12% of the wage/salary to the Employees' Provident Fund. The employee has to contribute 8% and it is the obligation of the employer to collect the contributions and remit the contributions to the Central Bank. Contributions have to be made in respect of all employees, including casuals.

For purposes of contributions total earnings include the basic wage, cost of living or special living allowance, payment in respect of holidays, the cash value of any cooked or uncooked food as assessed by the Commissioner of Labour, meal allowances, commissions paid to employees, incentive/piece rate earnings and fees.

Payments of benefits would have to be made upon the employee reaching 55 years in the case of males and 50 years in the case of females. Payments of benefits may also have to be made where the employee is leaving the country or is retiring on medical grounds, or, in the case of females on marriage.

The remittance of contributions should be made within one month from the end of the wage period. For delays a surcharge is levied which ranges from 5 to 50%. Returns have to be made to the Commissioner of Labour.

(e) Employees' Trust Fund (ETF) Act No : 46 of 1980 as amended

Under the law, an employer is required to contribute 3% of the employee's total earnings to the Employees Trust Fund. There is no contribution from the employee. This contribution should be made to the ETF within 30 days of the wage period ending and there are similar surcharges, which are prescribed.

(f) Payment of gratuity Act No : 12 of 1983 as amended

An employee who has 5 years of uninterrupted and continuous service is entitled to gratuity in terms of the Gratuity Act if the employer has more than 15 employees. The payment is half month's salary or 14 days wages where he has not been on a monthly salary, per year of service.

The Act applies if there are more than 15 employees, which includes casuals and apprentices as well. The gratuity becomes payable on the termination of an employee's service or cessation for any reason. For the purpose of this Act, the terminal salary would include the basic wages of living allowance, special living allowance and piece rates.

An employee would forfeit his gratuity if his services are terminated for fraud or willful damage or causing loss and the loss is quantifiable. However, where a gratuity has been deemed to be forfeited a Labour Tribunal may inquire has been deemed to be forfeited a Labour Tribunal may inquire into the matter and order payment. A surcharge is payable for delay beyond one month.

(g) Termination of employment of workmen (special provisions) act no : 45 of 1971

Order under Section 6D

The newly introduced Formula for Payment of compensation under the Termination of Employment of Workmen Act has come into operation with effect from 15th March 2005.

The new Formula is reproduced in Schedule II and a ready reckoner indicating the quantum of payment applicable for the number of years of service rendered by an employee is given in Schedule III.

SCHEDULE B

National Environmental Act (Amendment) No 56 of 1988

(a) SCHEDULE I

(Regulation 2)
Maximum Permissible Noise Levels at Boundaries in Laeq'T

Area	**LAeq'T**	
	Day Time	**Night Time**
Low Noise	55	45
Medium Noise	63*	50
High Noise	70	60
Silent Zone	50	45

* Provided that the noise level should not exceed 60 dB(A) inside existing houses, during day time.

(b) SCHEDULE II
(Regulation 3)
The following noise levels will be allowed where the background noise level exceed or is marginal to the given levels in Schedule I.

a)	For low noise areas in which the background noise level exceeds or is marginal to the given levels	Measured Background Noise level + 3 dB(A)
b)	For medium noise areas in which the background noise level exceeds or is marginal to the given levels	Measured Background Noise level + 3 dB(A)
c)	For silent zone in which the background noise level exceeds or is marginal to the given levels	Measured Background Noise level + 3 dB(A)
d)	For high noise areas in which the background noise level exceeds or is marginal to the given levels	
	For day time	Measured Background Noise level + 5 dB(A)
	For night time	Measured Background Noise level + 3 dB(A)

The above maximum noise levels should be maintained inside the boundary of the land, in which the source noise is located.

(c) SCHEDULE III
(Regulation 4)
Maximum permissible Noise Levels at Boundaries of the land in which the source of noise is located in LAeq'T, for construction activities.

LAeq',T	
Day time	**Night time**
75	50

(d) SCHEDULE IV

(Regulation 7 (a))

Maximum permissible Noise levels at Boundaries in Laeq',T for industrial activities.

Areas	**LAeq'T**	
	Day Time	**Night Time**
Rural Residential Area	55	45
Urban Residential Area	60	50
Noise Sensitive Area	50	45
Mixed Residential	63	55
Commercial Areas	65	55
Industrial Area	70	60

(e) SCHEDULE V

(Regulation 7 (b))

The following noise levels will be allowed in places where the background noise levels exceed or is marginal to the given levels in Schedule 1 :-

a) For rural residential areas in which the background noise level exceeds or is marginal to the given level	Measured Background Noise level + 3 dB(A)
b) For noise sensitive areas in which the background noise level exceeds or is marginal to the given level	Measured Background Noise level + 3 dB(A)
c) For noise sensitive areas in which the background noise level exceeds or is marginal to the given level	Measured Background Noise level + 3 dB(A)
d) For mixed residential areas or commercial areas in which the background noise level exceeds or is marginal to the given level For day time For night time	 Measured Background Noise level + 5 dB(A) Measured Background Noise level + 3 dB(A)
e) For industrial areas in which the background noise level exceeds or is marginal to the given level For day time For night time	 Measured Background Noise level + 5 dB(A) Measured Background Noise level + 3 dB(A)

CENTRAL ENVIRONMENTAL AUTHORITY
Pollution Control Division

(i) Interim Standards for Vibration Control

Table 2.1 : Interim standards for vibration of the Operation of Machinery, Construction Activities and Vehicle Movements Traffic

Category of the structure as given in Table 1.1	**Type of Vibration**	**Frequency of Vibration (Hz)**	**Vibration in PPV (mm/Sec)**
Type 1	Continuous	0-10	5.0
		10-50	7.5
		Over 50	15.0
	Intermittent	0-10	10.0
		10-50	15.0
		Over 50	30.0
Type 2	Continuous	0-10	2.0
		10-50	4.0
		Over 50	8.0
	Intermittent	0-10	4.0
		10-50	8.0
		Over 50	16.0
Type 3	Continuous	0-10	1.0
		10-50	2.0
		Over 50	4.0
	Intermittent	0-10	2.0
		10-50	4.0
		Over 50	8.0
Type 4	Continuous	0-10	0.25
		10-50	0.5
		Over 50	1.0
	Intermittent	0-10	0.5
		10-50	1.0
		Over 50	2.0

(ii) Table 2.2 : Interim Standards on Vibration for Blasting Activities

Category of the structure as given in Table 1.1	Type of Vibration	Type of Blasting	Ground Vibration I PPV (mm/sec.)	Air blast over Pressure (dB (L))
Type 1	Impulsive	Single bore hole	8.0	105
		Multi bore hold with delay detonators	10.0	115
Type 2	Impulsive	Single bore hole	6.0	105
		Multi bore hold with delay detonators	7.0	115
Type 3	Impulsive	Single bore hole	4.0	105
		Multi bore hold with delay detonators	5.0	115
Type 4	Impulsive	Single bore hole	0.5	95
		Multi bore hold with delay detonators	0.75	100

(iii) Standards for the inconvenience of the occupants in buildings

The frequency response of vibration of the human body is complex as explained in chapter 6. However, approximate response curves (basic curve) for Z axis are given in BS 6472 : 1992. These are given in terms of base curves, which may be close to the threshold of perception for majority of people

Table 3.1 : Base curve in relation to preparing of interim vibration for the inconvenience of the occupants in building taken from BS 6472 : 1992

Frequency Hz	PPV (mm/sec)
1.00	2.250
1.25	1.610
1.60	1.110
2.00	0.296
2.50	0.569
3.15	0.402
4.00	0.281
5.00	0.225
6.30	0.179
8.00	
10.00	
12.50	
16.00	
20.00	

25.00	
31.00	
40.00	
50.00	
63.00	

(iv) Table 3.2 : Multiplying factors use to specify magnitudes of building vibration with respect to human resource using the base curve in Table 3.1

Place	**Time**	**Multiplying Factors**		
		Continuous vibration (day time and night time)*	Impulsive vibration (max. of three occurrences per day)	Intermittent vibration
Critical working areas (e.g. hospital operating theatres, precision laboratories	Day Night	1 1	1 1	1 1
Residential	Day Night	6 2	40 10	20 5
Office	Day Night	6 6	80 80	30 30
Workshop	Day Night	8 8	100 100	50 50

Note : * “day time” from 0600h to 1800h
“night time” from 1800h to 0600h

4. Environmental and Social Risks

Environmental Risks	**Social Risks**
a) Construction Phase	**a) Construction Phase**
1. Modest clearing of land for the setting up of Channel, penstock path, forebay tank and powerhouse factory and premises.	1. Though large scale clearing of land is not envisaged, families may have to be relocated. Purchase of land may not be remunerated in the most justifiable manner.
2. Disturbance to rock boulder deposits in the up stream are during construction and operation of the project.	2. Transport, loading and unloading of materials being carried out a manner that is a nuisance to the villagers by way of noise and dust.
3. Disturbance to existing ground cover resulting in soil erosion. Where soil cover is disturbed the risk of adopting inadequate and appropriate soil conservation methods to stabilize disturbed slopes.	3. Transport of heavy loads being done during peak hours causing disturbance to the regular flow of traffic.
4. Inadequate volume of water being released down stream for maintaining a healthy ecology and for utility of villagers/users. Inadequate Maintenance of a continuous supply of water released through the weir at all times.	4. Inadequate safety for road uses and adjacent land occupants within the project area.
5. The noise levels at the boundaries of the project site exceeding the limits set out in the environmental standards. Methods of mitigating noise pollution such as purchase of surrounding land and growth of sound absorbing tree species not been grown as per environmental guidelines.	5. Safety of workers not being ensured during construction. Proper and adequate safety measures not being adopted.
6. Fine dust blowing from open topped lorries during transportation causing pollution.	
7. During dry periods exposed areas, such as access roads not being adequately dampened to prevent dust nuisance.	
8. Blasting operations being carried out without approval and not in accordance with laid out blasting procedure.	
9. Proper drainage system not being in place to carry debris and waste materials to established drainage routes	
10. Flushing of sediment deposits not being appropriately and periodically removed. Any sediment flushed out not being done so during high flood times.	
11. Inadequate treatment for discharge of effluent and sewage waste	
12 Transformer oil being discharged to inland waters	
13. Gaseous emissions and warm water emissions being discharged in to surface waters	
14 Air quality in the air space of the project being affected due to emissions as no proper safeguards are in place	

	b) General Health and Safety
	1. Inadequate first aid facilities on site
	2. Fire detection and fire fighting equipment not being in place and available at suitable locations.
	c) Others
	1. Non payment of statutory contributions to EPF and ETF by the employer

Annex III
Part v

SECTOR STUDIES

FOOD AND BEVERAGES

		2000	2001	2002	2003	2004	2005
value of industrial production @ 1990 constant prices [1]							
food & other	Rs. Mn	28,094	29,146	30,428	32,649	34,249	35,980
Liquor		3,397	3,478	3,659	4,098	4,389	4,720
Beverages		7,210	7,548	7,888	8,409	8,652	8,940
Food & Bev		**38,701**	**40,172**	**41,975**	**45,156**	**47,290**	**49,640**

value of industrial production (Rs. Mn) [1]							
F& B and tobacco	Rs. Mn	105,671	120,359	136,173	151,870	172,424	195,184

Capacity utilisation in industry[1]							
F& B and tobacco	%	89	89	90	90	91	91

Realised investment in BOI Enterprises [1]							
F& B and tobacco							
- no of enterprises	Number		146	143	148	155	147
- foreign inv	Rs. Mn		5,058	8,732	9,773	12,493	16,765
- INV potential	Rs. Mn		11,088	14,679	15,774	21,184	27,105

[1] CBSL annual report 2005

Manufacturing [2] (USD Mn)	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**Avg Growth %**
Processed fruit & fruit Juices	4.58	5.32	6.58	6.22	7.37	7.81	8.27
Confectionery and Bakery Products	2.82	2.25	2.34	3.43	4.64	5.22	9.6
Processed food	7.71	8.6	9.6	13.94	26.07	150.23	27.46
Beverages	1.55	1.85	1.77	1.88	2.31	2.99	13.55
Other	1.8	7.97	15.07	16.67	18.55	15.18	43.93

[2] EDB export performance indicators 2005

Environment : One of the key constraints faced by the food processing industry is the high import tariff on raw materials and packaging materials. Further the tariff on some of the imported finished products is lower than that of the raw materials. In view of this the cost of production of locally processed foods is high creating a disadvantageous situation when competing with the imported products. The food industry's best alternative processing techniques for food, drink and milk processing plants pinpoints water consumption, effluent discharges, energy use and waste generation as the most common environmental impacts across the food and drink sectors.

Workforce development : there is no proper school for training personnel needed for the food processing industry. Further the need for qualified technologists for the industry is also not identified.

Branding design & Marketing : Many established food processing companies lack market information and exposure to international markets.

Standards: Many processed food manufacturers in the country do not adhere to hygienic standards and market their products in the local market without any health certification. This situation weakens the ability of the food industry to penetrate export markets, which are making quality requirements more stringent.

Marketwise distri. Of Food & Beverages	usd Mn	**2001**	**2002**	**2003**	**2004**	**2005**
Exports to EU		4.86	6.38	13.83	24.05	27.65
Exports to other asian countries		5.21	11.65	9.45	16.15	13.15
Exports to SAARC countries		5.71	5.8	9.31	21.51	145.21

EDB export performance indicators 2005

F & B sector can be sub categorized into the following

- **Fruit & Vegetable Processing**
- **Meat Processing**
- **Fish Processing**
- **Dairy Products**
- **Confectionary**
- **Non Alcoholic Beverages**
- **Breweries**
- **Vegetable Oil Processing**
- **Sugar Manufacturing**

(A) INDUSTRY DECRIPTION

1. Fruit & Vegetable Processing

1.1. Processing involves

- Canning / bottling vegetables in brine
- Jams, cordials, pickles, chutneys, canned fruits & sauces
- Dehydrated and Frozen fruits and vegetables
- Fruit based non carbonated drinks
- Canned/ bottled ready to eat foods

Processing steps include preparation of the raw materials (fruit / vegetables) by way of

- Cleaning
- Trimming
- Peeling
- Cooking
- Canning
- Freezing

1.2. This industry generates large volumes of effluents & solid waste. The effluents contain cleansing & blanching agents, salts, suspended solids such as fibres & soil particles. May also contain pesticide residue washed from the raw material.

1.3. The main solid wastes are organic materials including discarded fruits/vegetables which are high in nutritional value and may be used as animal feed. Odor problems can occur with poor management of solid waste and effluents.

1.4. Leading brands dominate the urban markets while a multitude of smaller players vie for a share of the marketplace. A wide range of imported products are available while local competition is almost non existent. Lack of consistent and cost effective supplies and packaging also affect the growth in the industry.

1.5. The formal sector is made up of 15-20 registered processors covering two thirds of the volume while catering both to the local and export markets. There is an increasing tendency to use imported raw materials such as mango pulp and tomato paste owing to the cost and quality constraints in the locally grown raw material. Consumer preferences for imported canned fruits and vegetables is on a steady increase due to high quality , wide variety and low price.

2. Meat Processing

2.1. The meat processing and rendering industry includes the slaughter of animals and fowl, processing the carcasses into cured , canned and other meat products and the rendering of inedible and discarded remains into useful by products such as lard and oils.

2.2. The meat industry has the potential for generating large quantities of solid waste and waste water. The amount of wastewater generated and the pollutant load depend on the kind of meat being processed.

2.3. The waste water from a slaughterhouse can contain blood, manure, hair, fat feathers and bones. The wastewater may be at a high temperature and may contain organic material and nitrogen as well as such pathogens as salmonella and shigella bacteria, parasite eggs and amoebic cysts. Pesticide residue may be present from treatment of animals or their feed.

2.4. Chloride levels form curing and pickling may be very high. Smoking operations can release toxic organics into the air.

2.5. Rendering is an evaporative process that produces a condensate stream with a foul odour. All slaughtering waste (generally 35% of the animal weight) can be used a by-products or for rendering. The only significant solid waste going for disposal is the manure from animal transport and handling areas.

3. Fish Processing

3.1. The processing of fish involves firstly, the application of preservation techniques in order to retain quality and increase shelf life and secondly, it may also involve value adding to produce a wide variety of products.

3.2. The end products of fish processing may be

- **fresh, frozen or marinated fillets**, - involves the pretreatment , fish filleting, trimming of fillets , packing & storage. Pretreatment involves the removal of ice, washing, grading according to size and de-heading. Filleting generally done by mechanical machines cuts the fillet from the backbone and remove the collarbone. Some fish fillets may also be skinned at this stage. At trimming pin bones are removed and removes defects of any parts that are inferior quality. Off cuts are collected and minced. Packaging storage is done by individually packing in plastic and freezing fillets separately or packing into ice blocks (which is most commonly used in the industry)
- **canned fish** – Some fish types need to have skin removed by immersion in caustic bath before canning. The effluent generated by this has a high organic load and has to be neutralized before being discharged. The canning process depends on the size of the fish. Small fish species are canned whole with the heads and tails removed. The whole fish

products are cooked in the can after it has been filled with brine or oil. Medium/ large size fish are cut into pieces and precooked in the can before the can is filed with brine or oil and sealed , sterilized and then stored.

- **fish meal / fish oil** - The production of fish meal is included as it's a major product in terms of volume, and environmental impact. Fish meal and fish oil are produced from fish that are caught specifically for this market, by catch from fishing activities and solid waste from filleting and canning. Fish meal and fish oil have a high nutritional value where the fish meal is used as feed for livestock and farmed fish and the oil is used as an ingredient in paints and margarine.

4. Dairy

4.1. The diary industry involves processing raw milk into products such as consumer milk, butter, cheese, yoghurt, condensed milk, dried milk powder, ice creams using processes such as chilling, pasteurization and homogenization. Typical by products include buttermilk, whey and their derivatives.

4.2. Dairy effluents contain dissolved sugars and proteins, fats and possibly residues of additives.

4.3. A dairy often generates odors and in some cases dust which need to be controlled. Most of the solid wastes can be processed into other products and by products. Since the pollutants generated by the industry are very largely losses in production , improvements in production efficiency are recommended to reduce pollutant loads.

4.4. Only 17% of the islands milk consumption is produced locally with the rest imported as powdered milk from full cream to fortified infant milk to low fat to meet demand.

Production & Imports of milk

Year	Fresh Milk			Tinned Milk		Condensed Milk		Milk Food	
000 MT	cow	buffalo	total	local prod	imports	local prod	imports	local prod	imports
2004	134.88	25.84	160.72	13.98	54.02	5.06	0.16	2.54	0.38
2005	136.67	26.12	162.79	15.73	52.79	5.27	0.01	2.77	0.24

Dept of Census & Stats- food balance sheet

5. Confectionary

5.1. During the past few decades the industry has taken a quantum leap setting up large mechanized factories thereby improving and maintaining high quality standards. The confectionery products made locally, namely biscuits chocolates and sweets match up to any international brand.

5.2. The confectionery industry is characterized by the multitude of products and therefore production lines. Plants can have as few as one or two production lines or all of them. Service and ancillary units provide water and energy requirements as well as maintenance, storage, packaging, testing and analysis needs. Because of the nature of confectionery industry, equipment is characterized by designs, which facilitate hygienic operation, easy cleaning and sterilization. While many older plants use manual methods batch processing, modern facilities are automated and operate in a continuous mode. Shut down for cleaning is generally required at least once per day.

5.3. The main ***raw materials*** used are sugar, flour, cocoa, butter, powdered milk, oil, molasses, glucose, yeast, ammonium bicarbonate, sodium bicarbonate, dates, raisins, nuts, artificial flavors,lecithin, …

5.4. ***Chemicals*** are consumed at the facility for different purposes:

- In the lab for quality control and effluent analyses, such as organic solvents (ether, chloroform, acetone, toluene, hexane, ethyl and methyl alcohol's), acids (acetic, boric, oxalic, benzoic, hydrochloric, sulfuric), alkalis (sodium, potassium and ammonium hydroxides), potassium chloride, sodium sulfate, potassium iodide, culture media for microbial growth.
- For pH control such as dilute hydrochloric acid, sodium hydroxide
- As detergents and antiseptics for cleaning and sterilization (sodium hydroxide, nitric acid,sodium hypochlorite).
- ***Lube oil*** is used in the garage and workshops.
- Different types of ***packaging materials*** are also used (aluminum foil, plastic containers, tin sheets).
- ***Steam*** is generated in boilers that use either fuel oil, solar (gas oil) or natural gas as fuel. Steam is used for providing heat requirements and in some large facilities for electric power generations.
- ***Water*** is used as process water, as rinse water for equipment and floor, as boiler feed water, as cooling water and for domestic purposes. Boiler grade water is pretreated in softeners to prevent scale formation. Water may be supplied from public water lines, wells or canals. The type of water supply will dictate the type of pretreatment. (Note: Defining the inputs and outputs helps predict the expected pollutants)
- The confectionery industry does not generate large volumes of effluents as compared to the fruits and vegetable processing industry. However, the generated wastewater contains high organic loads, cleansing agents and suspended and dissolved solids

6. Non Alcoholic Beverages

6.1. The soft drink industry is composed of four key players: franchise companies, bottlers, retailers and consumers. Franchise companies are the owners of the brands. They manufacture the soft drink concentrate and market the brands. The franchisers business enjoys high gross margins of close to 80%. Their biggest expenses come from marketing, advertising, promotion, market research and managing their network of bottlers. The bottlers purchase the concentrate, mix it with sweeteners, and carbonated water, package and distribute the finished product and promote the products locally. The bottler's business is very capital intensive needing specialized-high speed equipment, distribution trucks, warehouses and info management systems. The bottler's gross margins are much lower, typically in the 15-45% range. Bottlers ultimately have the choice on how the product is presented to the market. In emerging markets like Sri Lanka, bottlers prefer to package their products in glass bottles because with the lower price points, the reusable package format is more affordable as opposed to the disposable aluminum cans.

6.2. The carbonated soft drinks market is dominated by three major players – the local Elephant House brand owned by John Keells and managed by Ceylon Cold Stores, Coke distributed and marketed by Coca Cola Beverages, and Pepsi, Mirinda, 7 up and Ole range of carbonated drinks distributed and marketed by the Maharaja Group.

6.3. The manufacture of carbonated soft drinks can be divided into the following sub-processes: preparation of sugar solutions, preparation of sweetener, preparation of water, preparation and mixing of flavours and concentrates and, finally, packaging and distribution

6.4. The beverage markets are evolving rapidly on a daily basis. Through this growth, the need for thermal processing became apparent with the requirements for preservative-free, natural,

shelf-stable, high-acid beverages that took hold of a market share along side the normal carbonated beverage product line.

6.5. Thermal processing reduces bacteria and allows for longer storage without preservatives. Typical beverage types include: iced tea, 100% juice drinks, juice-containing beverages, and isotonic sports drinks. All thermal processes are considered HTST (high-temperature-short-time). Basic Thermal Processing Methods include:

- **Hot Filled** - A finished beverage is heated to 190 degrees (F) and the container filled and capped. The product then goes through a cooling tunnel of cold water spray. The pH of the beverage must be below 4.6 but is commonly less than 3.9. Carbonated beverages CANNOT be hot filled.
- **Cold Filled** - A finished beverage is chemically preserved. This requires no heat treatment.
- **Tunnel Pasteurization** - A beverage without preservatives is filled into a can or bottle. The container is capped and then pasteurized by going through a tunnel with hot (160-190 degrees-F) water followed by a cooling tunnel. A good product example of this process is beer.
- **Aseptic Processing** - The beverage is sterilized by heating to high temperatures for a short period of time and then rapidly cooling the beverage without the introduction of microorganisms. Package is sterilized with hydrogen peroxide and/or steam. Product is then filled into the package without microorganisms. This process requires a "clean room."
- **Retort Processing** - The retort process is common for unpreserved beverages with a pH of greater than 4.0. The product reaches temperatures of at least 250 degrees (F) while it is already packaged.
- **Choosing the appropriate process involves determining desired packaging, the product ingredient/content, and the shelf-life considerations**

7. Breweries

7.1. **Beer -** is a low alcohol content beverage produced by fermenting sugars extracted from various types of cereals. A large number of different beer types exist that vary in the use of raw material, and the strength, taste profile, and packing of the final product. Each brewery generally has its own specific product and container mix. Production methods differ by brewery, as well as according to beer types, equipment, and national legislation. Most beer is produced from malted barley. However, there is a trend toward a more diverse group of cereals, with modern large breweries increasingly using maize and rice. The malt is extracted from the cereal into the water, hops are added, and the mixture boiled. After cooling, the mix is fermented with yeast to produce alcohol. This raw beer is then matured and packed. Some beers are filtered and pasteurized.

7.2. Liquor – is high alcohol content (25-40%) beverage produced from fermenting palm nectar (toddy) and/or molasses. Molasses or treacle is a thick syrupy by product from the processing of sugarcane or sugarbeet used to produce blended arrack, rum , gin.wines and brandy.

- **Palm Nectar (toddy)** The milky white sap ferments very quickly and becomes the heady liquid which is called toddy. The potent liquor is sometimes consumed as it is, but most of it is used to distill further. At the distillery, the toddy is purified and processed in copper stills and the coconut spirit extracted by a method of distillation. The extracted spirit is stored in wooden vats made of Halmilla timber. This particular timber is ideal for maturing spirit since it has the ability to make the coconut spirits mellow. No artificial flavours of ingredients are added. After a period of years in the vats, the spirits are diluted and blended to perfection.

- **Gin** - is made by adding the flavor of various botanicals (herbs and spices) to a neutral spirit. The first step is to distill the white spirit. It is rare to find a gin producer that distills its own neutral spirit. Often it is purchased from a plant which specializes in the manufacturing of neutral grain spirits for a variety of uses. The second step of crafting gin is made by re-distilling the spirit with the botanicals, either with these ingredients in the still, or by passing the vapor through the agents during distillation. Most *dry* gin is produced in column stills. Finally, pure water is added to bring the strength down.**Flavor:** Gin derives its main characteristic flavor from juniper berries. In addition to juniper berries, other botanicals may be used, including angelica root, anise, coriander, caraway seeds, lime, lemon and orange peel, licorice, calmus, cardamom, cassia bark, orris root, and bitter almonds. The use and proportion of any of these botanicals in the **gin formula** is left to the producer, and the character and quality of the gin will depend to a great extent on the skill of the distiller in formulating his recipe. The more discerning producers formulate their **aromatic ingredients** on the basis of the essential oil content in the raw materials to assure a greater degree of product uniformity.

8. Sugar manufacturing

8.1. The sugar industry processes sugar cane and sugar beet to manufacture edible sugar. More than 60% of the world's sugar production is from sugar cane; the balance is from sugar beet. Sugar manufacturing is a highly seasonal industry, with season lengths of about 6 to 18 weeks for beets and 20 to 32 weeks for cane. Approximately 10% of the sugar cane can be processed to commercial sugar

8.2. Sugar cane contains 70% water; 14% fiber; 13.3% saccharose (about 10 to 15% sucrose), and 2.7% soluble impurities. Sugar canes are generally washed, after which juice is extracted from them. The juice is clarified to remove mud, evaporated to prepare syrup, crystallized to separate out the liquor, and centrifuged to separate molasses from the crystals. Sugar crystals are then dried and may be further refined before bagging for shipment. In some places (for example, in South Africa), juice is extracted by a diffusion process that can give higher rates of extraction with lower energy consumption and reduced operating and maintenance costs. For processing sugar beet (water, 75%; sugar, 17%), only the washing, preparation, and extraction processes are different. After washing, the beet is sliced, and the slices are drawn into a slowly rotating diffuser where a countercurrent flow of water is used to remove sugar from the beet slices.

8.3. Sugar refining involves removal of impurities and decolorization. The steps generally followed include affination (mingling and centrifugation), melting, clarification, decolorization, evaporation, crystallization, and finishing. Decolorization methods use granular activated carbon, powdered activated carbon, ion exchange resins, and other materials.

9. Vegetable oil processing

9.1. The vegetable oil processing industry involves the extraction and processing of oils and fats from vegetable sources. Vegetable oils and fats are principally used for human consumption but are also used in animal feed, for medicinal purposes, and for certain technical applications. The oils and fats are extracted from a variety of fruits, seeds, and nuts. The preparation of raw materials includes husking, cleaning, crushing, and conditioning. The extraction processes are generally mechanical (boiling for fruits, pressing for seeds and nuts) or involve the use of solvent such as hexane. After boiling, the liquid oil is skimmed; after pressing, the oil is filtered; and after solvent extraction, the crude oil is separated and the

solvent is evaporated and recovered. Residues are conditioned (for example, dried) and are reprocessed to yield by-products such as animal feed. Crude oil refining includes degumming, neutralization, bleaching, deodorization, and further refining.

9.2. Dust is generated in materials handling and in the processing of raw materials, including in the cleaning, screening, and crushing operations.The wastewater is high in organic content. In addition, the wastewaters are high in dissolved solids, oil and fat residues, organic nitrogen, and ash residues.Most of the solid wastes, which are mainly of vegetable origin, can be processed into by-products or used as fuel. Molds may be found on peanut kernels, and aflatoxins may be present.

(B) PRESENT LEGAL FRAMEWORK

(B.1) APPLICABLE TO THE TOTAL F & B INDUSTRY: (SUMMARISED)

1. Food Act No 26 of 1980

The Act prohibits the manufacturing, import, sale or distribution of food unfit for human consumption, as well as the labelling, packaging and advertising of food in a false or misleading manner. The Chief Food Authority (for the purpose of this Act the Director of Health Services) must authorize the sale for purposes other than human consumption of food rendered unfit for human consumption. The manufacturing, preparation, storage, sale or distribution of food is subject to the issue of a licence by the competent Food Authority. Part II entrusts the implementation of this Act to the Food Advisory Committee and to Food Authorities, which shall exercise their duties within every administrative area pertaining to their competence. Part IV concerns legal proceedings.

2. National Environment Act No 47 of 1980 as amended by the amendments act no 56 of 1988 and no 53 of 2000

The Act provides for the establishment of the Central Environmental Authority, whose functions and duties shall be:

(a) to recommend to the Minister the national environmental policy and the criteria to be taken into account for the protection of the environment;
(b) to undertake surveys and investigations;
(c) to conduct, promote and coordinate research;
(d) to specify standards and methods to be adopted in taking samples and making tests;
(e) to provide information and education to the public;
(f) to promote, encourage and co-ordinate long range planning in environmental protection and management.

The Act makes provision for the establishment of the Environmental Council which shall generally advise the Authority on matters pertaining to its responsibilities, powers and duties, and on any matters referred to it by the Authority.According to the provisions of article 9 the Authority shall appoint a District Environmental Agency for each administrative district consisting "of such members as the Authority may determine" (art. 9).For the purpose of ensuring the rational exploitation of the country's natural resources, the Authority in consultation with the Council shall formulate and recommend to the Minister a land use scheme consistent with an efficient system of acquisition, utilization and disposition of land and with the rational use and conservation of land resources.

The Scheme may include:

(a) a land inventory and classification system;
(b) a determination of present land uses;
(c) an identification of the areas having historic, cultural or aesthetic value;
(d) a policy for influencing the location of new areas of resettlement and the methods for assuring appropriate control over the use of land in such areas.

3. **National Environmental (impact assessment regulations (1992)-**

4. **National Evironmental (procedure for approval of projects) regulations (1993)-** The Regulations set out the procedure to be followed for the approval of projects by the Project Approving Agency. The procedure consists inter alia of the following:
   - submission of preliminary information by the applicant;
   - submission of the Initial Environmental Examination Report;
   - granting or refusal to grant the approval;
   - notification of the Report for public inspection;
   - implementation of the proposed project.

5. **Wages Board Ordinance -** An ordinance for the regulation of wages and other employments of persons employed in trades

6. **Trade Unions Ordinance -** An ordinance to provide for the registration and control of trade unions

7. **Maternity benefits Act –** An ordinance to make provision for the payment of maternity benefits to women workers and for other matters incidental to the employment of such women before and after their confinement

8. **Factories Ordinance -** An ordinance to make provision for the safety and welfare of workers in factories

9. **Workmen's Compensation Ordinance**-
   Where it appears to the Labour Commissioner that in any factory or class or description of factory
   (a) cases of illness have occurred which he has reason to believe may be due to the nature of a process or other conditions of work; or
   (b) by reason of changes in any process or in the substances used in any process, or by reason of the introduction of any new process or new substance for use in a process, there may be risk of injury to the health of persons employed in that process; or
   (c) young persons are or are about to be employed in work which may cause risk of injury to their health, he may issue directions requiring such reasonable arrangements to be made for the medical supervision (not including medical treatment other than first-aid treatment and medical treatment of a preventive character) of the persons, or any class of the persons, employed at that factory or class or description of factory as may be specified in the directions.

10. **Employees' Provident Fund Act –**An act to establish a provident fund for the benefit of certain classes of employees

11. **Employees' Trust Fund Act-** An act to provide for the establishment of a fund called the Employees' Trust Fund and to provide for matters connected therewith.

12. **Termination of Employment of Workmen Act-**An act to make special provisions in respect of the termination of services of workmen in certain employments by their employers

13. **Industrial Disputes Act-** An act to provide for the prevention , investigation and settlement of industrial disputes

14. **Payment of Gratuity Act** - An act to provide for payment of gratuity by employers to their workmen

(B.2) ADDITIONAL LAWS APPLICABLE TO MEAT/ FISH INDUSTRY

1. **Animal Diseases Act (1992**)- An Act to provide for the control and prevention of contagious diseases in animals; for the control of the import and export of animals, animal products, and veterinary drugs and veterinary biological products, and for matters connected therewith or incidental thereto.

2. **Animal Diseases (Control & Prevention) Regulations (1998)**

Regulations to implement the Animal Diseases Act of 1992. The Regulations make provision for

- notification of importation of diseased live animals and investigation ;
- sealing of infected premises
- declaration of infected area by the Director
- seizure of animals
- destruction of animals
- disinfecting premises by the owner
- enforcement and inspection
- application of registration of premises to be used for livestock production, etc
- application for the establishment of a hatchery
- other licenses under sections 17 or 19 of the act
- permits to import embryos, etc.
- quarantine fees
- exportation of animals, animal products, embryos, etc.

3. **Animal Feed Act (1986)-** This Act is to regulate, supervise and control the manufacture, sale and distribution of animal feed in Sri Lanka. The Registrar of Animal Feed shall act as the licensing authority for the manufacture of animal feed. The Committee shall advise the Registrar on matters relating to

- licensing,
- manufacture,
- storage and preparation of animal feed

There are provisions relating to the particulars stated on the print or label. No person may manufacture, prepare or store any animal feed for sale that has been adulterated . Section 28 relates to penalties for contravention of this Act.

4. **Fisheries and Aquatic Resources Act 1996 (NO. 2 of 1996).** An Act to provide for the management, regulation, conservation and development of fisheries and aquatic resources in Sri Lanka; to repeal the Fisheries Ordinance, The Chank Fisheries Act and the Whaling Ordinance.

5. **Aquaculture Management Regulations (1996)-** These Regulations shall apply to aquaculture enterprises.No person shall set up or operate an aquaculture enterprise except under the authority of a licence issued to him by the Director of Fisheries and Aquatic Resources or any officer authorized by him. Regulation specifies the authorizing authority for each of the four categories of aquaculture enterprises. A licence shall not be transferable, be valid for one year and renewable. The Director may limit the number of licences in the interest of the economy and the environment. Regulations prescribe specific procedures and requirements for the granting licences for each category of aquaculture enterprise. "The Director may issue specific directions to licence holders where he considers it necessary to do so under special conditions".

6. **Aquaculture Management (Disease Control) Regulations (2000)** These Regulations shall apply to aquaculture enterprises in order to avoid or control the spreading of disease by implementing and operating the hygiene procedures, notifying eventual outbreak of infections and diseases, disposing of dead fish and waste; furthermore it provides for the exclusion of medically treated fish from human consumption,regulating or restricting vaccination and the use of additives. In the schedule are listed the diseases affecting fish, molluscs and crustaceans to which the present Regulations apply to.

7. **Fish Processing Establishments Regulations (1998)-** No person shall operate a fish processing establishment, except under authority of a licence of the Director of Fisheries and Aquatic Resources. The licence shall be valid for one year and may be revoked earlier by the Director if the licensee has violated terms of the licence or if the certificate of registration issued by the Sri Lanka Standards Institution has been cancelled.

(C) IDENTIFICATION OF ENVIRONMENTAL & SOCIAL RISKS

(i) Applicable to all sub sectors

Environmental Risks	Social Risks
Location of the processing plant **-**is the plant in a residential area or industrial processing zone?	-Do the workers have easy access to lodging, food, medical requirements etc if located in an industrial zone?
Solid Waste management - solid waste disposal – is it handled methodically with solid waste turned into animal feed and/or fertiliser -Till solid waste is disposed of in the appropriate manner is it kept in a place where it does not attract flies/cockroaches and other insects	-Are any production residue which needs to disposed of in any way entering into human consumption? **-** Are adequate sanitation facilities made available to the workers?
Waste water disposal - subject to pre treatment requirements by law -is the waste water disposed off into a river/stream/lake by which a threat would arise to the health of the humans/animals if consumed	
Processing plant noise -does the processing plant have a high degree of noise pollution to the immediate surroundings	
Energy use **-** Is there energy **inefficient** production processes?	
Emissions to the atmosphere -concentration of contaminants emitted from boilers , incinerators, furnaces and electrical generating equipment should conform to standards specified by the CEA guidelines	
Hazardous material handling in processing -storage and handling of hazardous material must be in accordance with local regulations and appropriate to their hazard characteristics -fire prevention systems and secondary containment should be provided for storage facilities where necessary or require by regulations -workplace air quality in relation to processing plant's operations	
	General Health -Are adequate ventilation systems in place at the work areas to control the temperature and humidity? - Are the workers in the processing areas directly handling the food/beverages subjected to pre employment and periodic medical check ups to make sure no diseases are passed on to the consumers? (eg Hepatitis vaccinations etc conforming to HACCP certifications)

	General safety **-** Are shield guards/ guard railings etc installed in all belts pulleys, blades etc which are moving parts of any processing equipment? -Is there fire prevention and fire safety programs implemented and include regular drills? -Are employees given proper training in handling the processing equipment and when handling hazardous material? -Are personnel trained in environmental and health and safety matters including accident prevention, safe lifting practices, safe chemical handling practices and proper maintenance of equipment and facilities?

(ii) <u>Applicable to Meat/ Fish Processing</u>

Environmental Risks	**Social Risks**
Location of the processing plant **-**is the plant in a residential area or industrial processing zone?	-If the plant is in a residential area has the air pollution been addressed in order to minimize the stale air that can result from the rotting offcuts etc? -Spread of diseases by the attraction of insects like flies cockroaches etc needs to be addressed.
Solid Waste management - solid waste disposal – is it handled methodically with solid waste turned into animal feed and/or fertiliser -Till solid waste is disposed of in the appropriate manner is it kept in a place where it does not attract flies/cockroaches and other insects	-Are any production residue which needs to disposed of in any way entering into human consumption? **-** Are adequate sanitation facilities made available to the workers?
Hazardous material handling in processing -storage and handling of hazardous material must be in accordance with local regulations and appropriate to their hazard characteristics -fire prevention systems and secondary containment should be provided for storage facilities where necessary or require by regulations -workplace air quality in relation to processing plant's operations	Chloride levels form curing and pickling may be very high. Smoking operations can release toxic organics into the air. Are workers provided with masks/ gloves etc in handling such chemicals? Is there a monitoring mechanism to check the quality of air released to the environment?

(iii) Applicable to Dairy

Environmental Risks	Social Risks
Energy use **-** Is there energy **inefficient** production processes? • Since the pollutants generated by the industry are very largely losses in production , improvements in production efficiency are recommended to reduce pollutant loads.	A dairy often generates odors and in some cases dust which need to be controlled. Most of the solid wastes can be processed into other products and by products

(iv) Applicable to Sugar Manufacturing

Environmental Risks	Social Risks
Location of the processing plant -Factory maybe located in an area where threat from elephants persist. -Clearing of natural forests for sugar cultivations - Cultivation may cause underground water beds drying up	-Snake attacks on farmers / workers

SECTOR STUDIES

HOTELS AND TOURISM SECTOR

1. Sub Categorization

1.1. Hotels and Tourism sector can be broadly categorized into the following sub categories

- Hotels and Restaurants
- Guesthouses
- Culture & heritage sites
- Travel agents and tour operators
- Airlines
- Agencies providing recreational facilities
- Tourist shops
- Guides

1.2. From the above sub categories the Bank's current exposure is mainly to the Hotels and Restaurants sub sector.

2. Industry description and Practices

2.1. Over 160 mn international visitor arrivals have been recorded within the Asia Pacific region in the year 2005.This indicates the growing demand and potential that regional destinations like Sri Lanka have in the macro picture of Global Tourism.

2.2. The Tsunami and the aftermath of it devastated most of Sri Lanka's coast line and adversely affected many beach hotels in the country. In addition, to surviving the tsunami, Sri Lanka's tourism potential has been further dilapidated by continued political instability in the North and East resulting in negative international media coverage that hindered tour operators and discouraged many potential holiday makers.

2.3. Tourism is the fourth largest foreign exchange income earner for Sri Lanka, where a wide audience ranging from conglomerates to individuals makes their livelihood though operating in the industry. The industry however, has contributed to socially demeaning and unacceptable activities such as child labour, child prostitution, female / male prostitution, drug abuse etc.

2.4. Key points that will be paramount in the furtherance of the tourism industry will be;

- The status quo in the peace initiatives
- The development of infrastructure supporting tourism, transportation being the most notable.
- Training and development facilities for human resources attached to the tourism sector.

3. Present Legal Framework Applicable

(A) Environmental Aspects

3.1. The main body governing the environmental aspects relating to the hotels and tourism sector is the Central Environmental Authority (CEA). Under the provisions of National Environmental Act No. 47 of 1980 as amended by the Amendments Acts No 56 of 1998 and No 53 of 2000 the prescribed activities for which Environmental Protection License (EPL) is required has been listed under Part "A" and "B" of the schedule of the Gazette notification no.1159/22 dated 22.11.2000.

3.2. Activities in the hotel and tourism sector which needs to obtain EPL are as follows;

- Hotels, guest houses, rest houses with 20 or more rooms and Hotels having boarding capacity of 200 or more boarders - Requires to obtain EPL from Central Environmental Authority

- Residential hotels, guest houses, rest houses with less than 20 rooms and Non-residential hotels, restaurants, eating houses with cooking facilities where more than 5 workers are employed. – required to obtain EPL from the Local Government Authorities, namely Municipal Councils, Urban Councils and Pradeshiya Sabhas to whom the authority of issuing, monitoring and following up is delegated by CEA.

3.3. In addition to the above, CEA has also specified the standards for following;

(i) General Standards for Discharge of Effluent into Inland Surface waters –
(ii) Gazette Notification No. 595/16 dated 02.02.1990 termed as the *National Environmental (Protection & Quality) Regulations No.1 of 1990.* – **Schedule 1**
(iii) **Ambient Air Quality Standards –** Gazette Notification No. 11-193/1, 2A-D 034203 (94/10) dated 05.10.1994 *National Environment (Ambient Air Quality) Regulation* 1994 –**Schedule 2**
(iv) **Permissible Noise Levels** - Gazette Notification No. 924/12 dated 21.05.1996 *National Environment (Noise Control) Regulation No. 1* 1996 – **Schedule 3**
(v) **Waste Handling Regulations -** Gazette Notification No. 924/13 dated 25.04.1996 *National Environment (Protection & Quality) Regulation No. 1* 1990
(vi) Vibration Control Standard– Schedule 4

3.4. Further establishments in this sector should obtain prior approval from;

(i) the Coast Conservation Department
(ii) the Ceylon Tourist Board with regard to commencement of operations, sell and serve liquor and to obtain star class category(if applicable).

(B) Social Aspects

3.5. In relation to Social Aspects, Legislation applicable to all enterprises and workers including Free Trade Zones whether owned by nationals or non-nationals are governed mainly by;

(i) Factories Ordinance No. 45 of 1942 - safety and welfare of the factory workers.

(ii) **Shop & Office Employees (regulation of Employment & Remuneration) Act No.19 of 1954 as amended**; - safety and welfare of administrative clerical staff

(iii) **Wages Boards Ordinance No. 27 of 1941 as amended** - prescribe minimum wages and other conditions namely holiday, leave and overtime rates for the relevant trades.

(iv) **Child Labour** -An amendment to the Employment of Women, Young Persons and Children Act (No. 47), 1956.

The minimum age for employment of children was raised from 12 to 14 years in December 1999. At present, the minimum age of employment in all sectors other than the plantation sector is 14 years. Further, through the Ministry of Labour, the legislation has been amended to provide for payment of compensation to victims, by employers violating the minimum age of employment laws.

(v) **Forced Labour** - No employer shall use any form of forced or compulsory labor.

(vi) **Equal status -** Male and Female workers shall be accorded equal opportunity in employment and occupation and paid equal remuneration for work of equal value.

(vii) **Compulsory Education** -Education Ordinance of 1940, - Compulsory School Attendance, education and attendance at school were made compulsory for every Sri Lankan child aged between 5 and 14 years.

(viii) **Registration of a Factory** - *Factories Ordinance No.45 of 1942 as amended Section 126(1)* Defines a Factory as a premise which employees are employed in manual labour. This requires a Factory to be registered and it would be an offence to be the occupier of any factory unless such factory is registered and licensed.

(ix) **Overtime -** Under the same Ordinance in c) above, provisions are available for overtime employment of women and young persons who are above sixteen but less than eighteen provided that the overtime worked by a woman shall not exceed in aggregate sixty hours in any calendar month and overtime worked by a young person (<16>18 years) , shall not exceed in the aggregate fifty hours in any calendar month. It also does not permit engaging the following persons in overtime.

- A pregnant Woman during her pregnancy
- A nursing mother for a period of one year from the birth of the child
- A woman delivered a still born child for a period of three months.

(x) **Wages Board Ordinance No 27 of 1941 as amended.**

(xi) **Provident Fund** - *Employees' Provident Fund (EPF) Act No 15. -* The employer is expected to contribute 12% of the wage/ salary to EPF. The employee has to contribute 8% and it is the obligation of the employer to collect the contributions and remit the contributions to the Central Bank.

(xii) **Trust Fund** - *Employees' Trust Fund (ETF) Act No 46 of 1980 as amended*, - An employer is required to contribute 3% of the employee's total earnings to the ETF. There is no contribution from the employee. This contribution should be made to ETF during 30 days of the wage period ending.

(xiii) **Gratuity -** *Payment of Gratuity Act No 12 of 1983* **-** An employee who has 5 years uninterrupted and continuous service is entitled to gratuity in terms of the above Act. The payment is half month's salary or 14 days wages where he has not been on a monthly salary, per year of service.. This act is applicable if there are more than 15 employees.

(xiv) **Termination –** *Employment of Workmen (Special Provisions) Act No 45 of 1971 (order under section 6D) -* New formula for payment of compensation was introduced under the termination of the above Act.

(xv) **Recruitment and Retirement** - The minimum age for recruitment shall be 18 years. The normal age of retirement is age 55 years. However extension beyond 55 years can be granted as the discretion of the management. Persons who have attained the age of 16 years but below the age 18 years can be employed, subject to the following conditions.

- Persons under 18 years cannot be employed for more that 50 hours of overtime during any month.
- Persons under the age of 18 years cannot be employed after 10.00 pm and before 6.00 a.m

3.6. Sri Lanka has ratified all eight of the ILO's fundamental conventions reflected in the 1998 Declaration on Fundamental Principles and Rights at Work:
Convention No. 29 on Forced Labor
Convention No. 87 on Freedom of Association and Protection of the Right to Organize
Convention No. 98 on the Right to Organize and Collective Bargaining
Convention No. 100 on Equal Remuneration
Convention No. 105 on the Abolition of Forced Labor
Convention No. 111 on Discrimination (Employment and Occupation)
Convention No. 138 on the Minimum Age for Admission to Employment
Convention No. 182 on the Worst Forms of Child Labor

4. Identification of E&S Risks – Hotel and Tourism

(A) Environmental Risks

These risks can be divided into two sections

1. Risks occurs during the site selection/ development and construction phase
    a. Site selection/ development
        i. Constructions in protected areas/ conserved areas
        ii. Possible danger to fauna and flora
        iii. Local population to be relocated
        iv. Significant cultural properties/ ecosystems/ natual habitats etc.
    b. Construction work
        i. Issues in relation to infrastructure developments such as roads etc.
        ii. Impacts on local water bodies during construction.
        iii. Destruction of sensitive vegetations.
        iv. Erosion and sediment may cause problems.
2. Risks during the operations
        i. Proper disposal and management of emission of Sewerage
        ii. Reduction of noise pollution
        iii. Destruction of mangroves in beaches while constructing hotels, which results in, increased erosion of sea.
        iv. Demand for products, produced out of endangered animals, trees and natural endowments (E.g., elephant tusks, cutting of Kaluwara trees, coral reef)

(B) Social Risks

1. Child labour
2. Child prostitution
3. Male / Female prostitution
4. Drug abuse
5. Money Laundering / Infusion of black money into the financial system of the country
6. Filtration of the western culture which are unacceptable as per given Sri Lankan value and norms

Schedule I

1. DISCHARGED STANDARDS BASED ON THE RECEIVING ENVIRONMENT

a) General Standards For Discharge Of Effluent Into Inland Surface Waters

No.	Determinant	Tolerance Limit
1.	Total Suspended Solids, mg/l, max	50
2.	Particle size of total suspended solids	Shall pass sieve of aperture size 850 micro m
3.	pH value at ambient temperature	6.0 to 8.5
4.	Biochemical Oxygen Demand-BOD_5 in 5 days at 20° C, mg/l, max	30
5.	Temperature of discharge	Shall not exceed 40° C in any Section of the Stream within 25m down stream from the effluent outlet.
6.	Oils and greases, mg/l max	10.0
7.	Phenolic Compounds (as phenolic OH)mg/l. max	1.0
8.	Cyandes as (CN) mg/l, max	0.2
9.	Sulfides, mg/l, max	2.0
10.	Flourides, mg/l, max	2.0
11.	Total residual chlorine mg/l, max	1.0
12.	Arsenic, mg/l, max	0.2
13.	Cadmium total, mg/l, max	0.1
14.	Chromium total, mg/l, max	0.1
15.	Copper total, mg/l, max	3.0
16.	Lead, total, mg/l, max	0.1
17.	Mercury total, mg/l, max	0.0005
18.	Nickel total, mg/l, max	3.0
19.	Selenium total, mg/l, max	0.05
20.	Zinc total, mg/l, max	5.0
21.	Ammoniacal nitrogen, mg/l, max	50.0
22.	Pesticides	Undetectable
23.	Radio active material	
	a. Alpha emitters micro curie/ml	10^{-7}
	b. Beta-emitters micro curie/ml	10^{-6}
24	Chemical Oxygen Demand (COD), mg/l, max	250

Note 1 : All efforts should be made to remove colour and unpleasant odour as far as practicable.

Note 2 : These values are based on dilution of effluents by at least 8 volumes of clean receiving water. If the dilution is below 8 times, the permissible limits are multiplied by 1/8 of the actual dilution.

Note 3 : The above mentioned General Standards shall cease to apply with regard to a particular industry when industry specific standards are notified for that industry.

Schedule II

Ozone Depleting Substances and National Environmental (Ambient Air Quality) Regulations 1994

Ambient Air Quality Standard

Pollutant	Averaging Time*	Maximum Permissible Level		Method of Measurement
		In mg/m3	In ppm	
Carbon Monoxide	8 hr.	10.0	9.0	Non-dispersive infrared spectroscopy
	1 hr.	30.0	26.0	
	Any Time	58.0	50.0	
Nitrogen Dioxide	24 hr.	0.10	0.05	Coloring using Saitzman method or equivalent (gas phase chemiluminescence)
	8 hr.	0.15	0.08	
	1 hr.	0.25	0.13	
Sulfur Dioxide	24 hr.	0.08	0.03	Pararosaniline method of equivalent (pulsed fluorescent method)
	8 hr.	0.12	0.05	
	1 hr.	0.20	0.08	
Ozone	1 hr.	0.20	0.10	Chemiluminescence method or equivalent (UV photometric method)
Lead	Annual	0.0005	-	Hi-volume sampling, wet ashing /atomic absorption or spectroscopy
	24 hr.	0.002	-	
Suspended Particulate Matter(SPM)	Annual	0.10	-	Hi-volume sampling & Gravimetric
	24 hr.	0.30	-	
	8 hr.	035	-	
	3 hr.	0.45	-	
	1 hr.	0.50	-	

* Minimum number of observations required to determine the average over the specified period:

03 hour average – 03 consecutive hourly average
08 hour average – 06 hourly average
24 hour average – 18 hourly average
Yearly average – 09 monthly averages with at least 02 monthly average each quarter.

By wet chemistry methods or by automated analysis.

Schedule III

National Environmental (Noise Control) Regulations 1996

(Regulation 2)

Maximum Permissible Noise Levels at Boundaries in LAeq'T.

Area	LAeq'T	
	Day time	Night Time
Low Noise	55	45
Medium Noise	63*	50
High Noise	70	60
Silent Zone	50	45

* Provided that the noise level should not exceed 60 dB (A) inside existing houses, during day time.

The above maximum noise levels should be maintained inside the boundary of the land, in which the source noise is located.

(Regulation 3)

The following noise levels will be allowed where the background noise level exceed or is marginal to the given levels in Schedule 1.

a) For low noise areas in which the background noise level exceed or is marginal to the given levels	Measured Background Noise level + 3 dB (A)
b) For medium noise areas in which the Background noise level exceeds or is Marginal to the given level	Measured Background Noise level + 3 dB (A)
c) For silent zone in which the background Noise level exceeds or is marginal to the Given level	Measured Background Noise level + 3 dB (A)
d) For high noise areas in which the background noise level exceeds or is marginal to the given level	
For day time	Measured Background Noise Level +5 dB (A)
For Night time	Measured Background Noise Level +3 dB (A)

(Regulation 7 (a)

Maximum permissible Noise levels at Boundaries in LAeq ,T, for industrial activities.

Maxi
noise

	LAeq', T	
Areas	**Day time**	**Night time**
Rural Residential Area	55	45
Urban Residential Area	60	50
Noise Sensitive Area	50	45
Mixed Residential	63	55
Commercial Areas	65	55
Industrial Area	70	60

(Regulation 7 (b))

The following noise levels will be allowed in places where the background noise levels exceed or is marginal to the given levels in Schedule 1 :-

a. For rural residential areas in which the background Noise level exceeds or marginal to the given level	Measured Background Noise Level +3 dB (A)
b. For noise sensitive areas in which the background noise level exceeds or is marginal to the given level	Measured Background Noise Level +3 dB (A)
c. For noise sensitive areas in which the background Noise level exceeds or is marginal to the given level	Measured Background Noise Level +3 dB (A)
d. For mixed residential or commercial areas in which the background noise level exceed or marginal to the given level	
(i) For day	Measured Background Noise Level +5 dB (A)
(ii) For night time	Measured Background Noise Level +3 dB (A)
e. For industrial areas in which the background noise level exceeds or is marginal to the given level	
(i) For day	Measured Background Noise Level +5 dB (A)
(ii) For night time	Measured Background Noise Level +3 dB (A)

(Regulation 7 (c))

Area	LAeq' T	
	Day time	Night Time
Industrial/Commercial	75	60
Urban/Rural/Mixed Residential	65	50

2. Interim Standards for Vibration Control

Table 2.1: Interim Standards for vibration of the Operation of Machinery, Construction Activities and Vehicle Movements Traffic

Category of the structure as given in Table 1.1	Type of Vibration	Frequency of Vibration (Hz)	Vibration in PPV (mm/Sec.)
Type 1	Continuous	0 – 10	5.0
		10-50	7.5
		Over 50	15.0
	Intermittent	0 – 10	10.0
		10 –50	15.0
		Over 50	30.0
Type 2	Continuous	0 - 10	2.0
		10-50	4.0
		Over 50	8.0
	Intermittent	0 – 10	4.0
		10 –50	8.0
		Over 50	16.0
Type 3	Continuous	0 - 10	1.0
		10 - 50	2.0
		Over 50	4.0
	Intermittent	0 - 10	2.0
		10 – 50	4.0
		Over 50	8.0
Type 4	Continuous	0 - 10	0.25
		10 – 50	0.5
		Over 50	1.0
	Intermittent	0 – 10	0.5
		10 - 50	1.0
		Over 50	2.0

Notes

1. Please see separate measurement methods
2. The values given above are in such a way that minor damage is unlikely as the nearby house/building

Table 3.2 Multiplying factors use to specify magnitudes of building vibration with respect to human resource using the base curve in Table 3.1

Place	Time	Multiplying factors		
		Continuous vibration (day time and night time)*	Impulsive vibration (max. of three occurrence per day	Intermittent vibration
Critical working areas (e.g hospital operating theatres, precision laboratories	Day	1	1	1
	Night	1	1	1
Residential	Day	6	40	20
	Night	2	10	5
Office	Day	6	80	30
	Night	6	80	30
Workshop	Day	8	100	50
	Night	8	100	50

Note: * "day time" from 0600 h to 1800h
"night time" from 1800h to 0600h

Table 3.3: Interim standards on vibration for the inconvenience of the occupants in buildings

Place	Time	Multiplying factors		
		Continuous vibration (day time and night time)*	Impulsive vibration (max. of three occurrences per day	Intermitted vibration
Critical working areas	Day & Night	0.141	0.141	0.141
Residential	Day Night	0.705 0.282	5.640 1.410	2.820 0.705
Office	Day & Night	0.846	11.280	4.230
Workshop	Day & Night	1.41	1.41	7.05

Note * " day time" from 0600 to 1800h
" night time" from 1800h to 0600h

All values are frequency weighted to vertical axis

SECTOR STUDIES

METALS SECTOR

Value of industrial production @ 1990 constant prices

		2000	2001	2002	2003	2004	2005
Basic Metal Products	Rs. Mn	2,024	2096	2155	2254	2455	2600
Fabricated metal Products, machinery and transport equipment		9071	9261	9446	10079	10,512	10,825
Metal industry		**11,095**	**11,357**	2155	**12,333**	**12,967**	**13,425**

value of industrial production (Rs. Mn)

Basic Metal Products	Rs. Mn	3378	3888	4323	4690	5366	6278
Fabricated metal Products, machinery and transport equipment		15,678	17,638	19,358	21,872	24,964	28,237

Capacity utilisation in industry

Basic Metal Products	%	50	50	54	58	59	61
Fabricated metal Products, machinery and transport equipment		87	89	89	89	89	88

Realised investment in BOI Enterprises

Basic Metal Products							
- no of enterprises	Number	-	-	-	-	-	-
- foreign inv	Rs. Mn	-	-	-	-	-	-
- INV potential	Rs. Mn	-	-	-	-	-	-
Fabricated metal Products, machinery and transport equipment							
- no of enterprises	Number		41	67	75	88	92
- foreign inv	Rs. Mn		3769	5562	6390	7189	9827
- INV potential	Rs. Mn		5116	7230	8088	9454	12,383

Metal sector can be sub categorized into the following

- **Steel Products**
- **Copper & Copper Products**
- **Aluminum Products**

1. INDUSTRY DESCRIPTION

(A) Iron & Steel Products

1.1. The industry includes firms that manufacture basic steel shapes (such as bar, plate, rod, sheet, strip and wire) or form pipe and tube from imported steel.

1.2. The major products and services covered in this industry are:

- Hot rolled sheet and strip
- Hot rolled bars
- Cold rolled sheet and strip
- Steel pipe and tube
- Steel ingots
- Wire
- Cold finished steel bars and shapes
- Ferroalloys

1.3. The primary activities of companies in this industry are:

- Direct reduction of iron ore
- Manufacturing and/or converting pig iron
- Making and/or manufacturing steel products

Waste Characteristics

1.4. Furnace used to manufacture metal products produce metal dusts, slag, and gaseous emissions. The primary hazardous components of dust are zinc, lead, and cadmium; nickel and chromium are present when stainless steels are manufactured. The composition of dust can vary greatly, depending on scrap composition and furnace additives. Furnace dust usually has a zinc content of more than 15

1.5. Major pollutants present in the air emissions include particulates, nitrogen oxides from cutting, scarfing, and pickling operations, and acid fumes from pickling operations.

1.6. Mini mills also generate wastewater. The characteristics of the wastewater depend on the type of steel, the forming and finishing operations, and the quality of scrap used as feed to the process.

1.7. Solid wastes include furnace dust and wastewater treatment sludge's.

Steel Industry in Sri Lanka

The metals industry in Sri Lanka is dominated by a few players who manufacture heavy-duty metal structures for construction purposes. The industry is linked to the construction industry and depends on the trends of the constructions in the country. Therefore, to track growth in the basic metals industry will require growth in the construction industry, which in turn depends on government policy, foreign aid & rates.

Main Players: Buwalka Steel & Confab Melbourne metal, Ceylon Heavy industries, GTB Steel

(B) Copper & Copper Products

Firms in this industry have as their main focus melting scrap/billets, extruding shapes, (such as bar, plate, sheet, strip, tube, and wire) from melted copper. Typically, firms in the industry use both newly produced copper and scrap copper to produce a range of fabricated products, such as tubes, wire, sheet, strip and bar from copper and copper alloys.

The main companies in sri lanka are Colombo copper, Reymet (Pvt) Ltd ,Agro met (Pvt) Ltd,Shanshi (Pvt) Ltd , Mirigama Lanka (Pvt) Ltd . Sri Charad (Pvt) Ltd

(C) Aluminium Products

Firms in this industry engage in one or more of the processes involved in converting the aluminum-bearing ore bauxite into aluminum products (including plate, sheet, foil and extrusions). The industry also includes firms that recover aluminum from scrap.

The major products and services covered in this market research report are

- Aluminum sheet, plate and foil
- Aluminum extrusions
- Primary aluminum
- Secondary aluminium
- Other aluminum rolling and drawing

2. PRESENT LEGAL FRAMEWORK APPLICABLE:

(A) Central Environment Authority Certificate

2.1. Under the provisions of National Environmental Act No.47 of 1980 as amended by the Amendment Acts No.56 of 1988 and No.53 of 2000 to carry out a prescribed activity listed in the gazette notification No.1159/22 dated 22.11.2000 a valid Environmental Protection Licence (EPL) should be obtained from the Central Environmental Authority.

2.2. The Following are considered as significantly polluting industries:

(a) Iron & Steel Mills
(b) Non ferrous metal processing industries such as lead, copper, aluminum smelting, secondary lead processing or recovery of metals including silver recovery
(c) Metal fabricating industries, machine tools, equipment manufacturing and assembling industries where more than 25 workers are employed

2.3. Section 23 A (2) of the National Environmental Act (NEA) explicit that no person shall carry out any prescribed activity expect (a-c of above) under the authority of an EPL and in accordance with such standards and other criteria as may be prescribed under this Act

(B) Standards for discharge of wastewater

2.4. The standards for discharge of wastewater into the environment are published in the Gazette Notification No. 595/16 dated 02.02.1990 termed as the National Environmental (Protection & Quality) Regulations No.1 of 1990.

(C) Standards for Noise Emission

2.5. Standards were also gazetted for the control of noise emissions from industries by the Gazette Notification no. 924/12 dated 23.05.1996 termed as National Environmental (Noise Control) Regulations No. 01 of 1996

(D) The Environmental Protection Licence (EPL)

2.6. The Environmental Protection Licence issued to prescribed activity will stipulate the standards and criteria under which such an activity is allowed to discharge their wastes.

2.7. The EPL issued to a prescribed activity is legally binding on such activities and the violation of the conditions in the licence is an offence punishable under the provisions of NEA. \

2.8. The EPL issued shall be valid for such period as specified in the licence but shall not be more than a period of 3 years subject to any suspension or cancellation.

2.9. The EPL is renewable.

2.10. The holder of an EPL is under the obligation to comply with any directives given by the CEA to prevent or mitigate environmental pollution and hazards.

2.11. The holder of the EPL shall permit Director General of the CEA or any other officer duly authorized at any time to enter the premises and inspect any equipment or industrial plant and to take samples of pollutants.

2.12. The EPL shall ensure that monitoring of environmental pollution or other acts that the CEA considers necessary to protect the environment

(E) Factories Ordinance

(i) Registration

2.13. The factories ordinance requires a factory to be registered. This rules applies both to the construction of a factory as well the extensions to existing factories and conversion of existing buildings to factories. It is obligatory that prior to the construction or alternation, the site at which such construction or modification is to be done, be approved by the chief Inspecting Engineer or the District factory Engineer and the buildings must be approved by a panel of civil Engineers nominated by the commissioner of Labour for the purpose of reporting on the structural worthiness of the factory building.

(ii) Health

2.14. The ordinance makes provisions for matters such as cleanliness, overcrowding, temperature control, ventilation, lighting facilities, drainage and sanitary conveniences and for medical supervision.

(iii) Safety of workers in the factory

2.15. It has been made compulsory for dangerous machinery or parts to be securely fenced, maintenance, quality and mechanical conditions machinery such as hoists, lifts, chain ropes, cranes, the maintenance of floors, passage of stairs, access in general is also covered in the ordinance

(iv) Welfare

2.16. Deals with general welfare such as supply of wholesome water, washing facilities, accommodation for clothing, facilities for resting for female workers and first aid.

A certificate is issued on compliance of above, which is renewed annually.

(F) Labour related laws:

2.17. A number of laws regulate the various aspects of employer –employee relations ,which are given below:

(i) **Shop and office Employee Act --** An ordinance to make provision for the safety and welfare of workers in factories .

(ii) **Wages Board Ordinance** - An ordinance for the regulation of wages and other employments of persons employed in trades.

(iii) **Trade unions Ordinance** - An ordinance to provide for the registration and control of trade unions.

(iv) **Maternity Benefits Act** - An ordinance to make provision for the payment of maternity benefits to women workers and for other matters incidental to the employment of such women before and after their confinement.

(v) **Factories Ordinance** - An ordinance to make provision for the safety and welfare of workers in factories .

(vi) **Workmen's compensation Ordinance** - Where it appears to the Labour Commissioner that in any factory or class or description of factory

- cases of illness have occurred which he has reason to believe may be due to the nature of a process or other conditions of work; or

- by reason of changes in any process or in the substances used in any process, or by reason of the introduction of any new process or new substance for use in a process, there may be risk of injury to the health of persons employed in that process; or

- young persons are or are about to be employed in work which may cause risk of injury to their health, he may issue directions requiring such reasonable arrangements to be made for the medical supervision (not including medical treatment other than first-aid treatment and medical treatment of a preventive character) of the persons, or any class of the persons, employed at that factory or class or description of factory as may be specified in the directions.

(vii) **Employees' Provident Fund Act** –An act to establish a provident fund for the benefit of certain classes of employees.

(VIII) **Employees' Trust Fund Act-** An act to provide for the establishment of a fund called the Employees' Trust Fund and to provide for matters connected therewith.

(IX) **Termination of Employment of Workmen Act-**An act to make special provisions in respect of the termination of services of workmen in certain employments by their employers.

(x) **Industrial Disputes Act**- An act to provide for the prevention, investigation and settlement of industrial disputes.

(xi) Payment of Gratuity Act - An act to provide for payment of gratuity by employers to their workmen

3. IDENTIFICATION OF E & S RISKS

ENVIRONMENT	SOCIAL
Location of the plant not in a industrial Processing Zone	Unprotected/not properly maintained machinery would result in workers getting electrocuted /exposed to accidents
Emissions of particulate matter (PM) from the melting and treatment of molten metal, as well as from mold manufacture, shakeout, cleaning and after-treatment.	Energy wastage by leakages
Oil and suspended solids are released into process Effluents.	Health in General ➢ Effect of handling hazardous material on employees health ➢ Inadequate sanitation/Ventilation systems ➢ No periodical medical check ups on personnel handing hazardous material
Wastewater from tumbling may contain metals and surfactants. Cooling waters may contain oil and Some chemicals for the control of algae and corrosion.	Safety in General ➢ Dangers in not implementing proper fire prevention/safety programs, ➢ Personnel not trained in safety matters (eg: accident prevention, safe lifting practices,), maintenance of machinery) ➢ Non-availability of first aid facilities. ➢ Non availability of protective gear ➢ Difficult /unsafe working conditions ➢ Long working hrs ➢ Wages below standard Levels
Steel/Aluminum Mill noise	
Emission of dust	

SECTOR STUDIES

PLANTATION INDUSTRY

1. Sub Categorization

1.1. NDB's exposure to plantation sector largely consists of Regional Plantation Companies and the Small Scale Private Holders and both the above are in the following sub categories.

Tea Plantation
Rubber Plantation
Oil Palm Plantation
Coconut Plantation
Paddy Plantation
Other Economic Crops

2. Industry Description and Practices

2.1. Agriculture sector contributes 17.2% towards the national Gross Domestic Production (GDP), thus is an important sector in the national economy. Tea and rubber collectively contributes 15.4 % towards the national GDP. Therefore Tea and Rubber sub sectors accounts for a significant portion of the Agriculture sector. In addition, 92% of NDB's exposure is to Regional Plantation Companies (RPC) while the balance 8% is for the small holders. Regional Plantation companies are largely involved in Tea and Rubber while they also have Oil Palm and Coconut to a lesser extent. As such this paper would concentrate on likely Environmental and Social issues in Tea and Rubber planations of RPC's.

2.2. Tea and Rubber are among the most labour intensive of all plantation crops. They have both agricultural as well as manufacturing dimension. A brief account of both agricultural and manufacturing activities is given below.

(A) Tea Plantation

a) **Harvesting** – Commonly referred to as plucking and this activity is highly labour intensive. (Despite the tendency lately in some areas in the South Asian region to use mechanized methods for harvesting during the heavy crop seasons). Plucking in tea industry alone accounts for about 70% of the workdays on estates and about 40% of the total cost of production.

b) **Fertilizing** - Fertilizing will vary from estate to estate depending on the soil condition of each estate. Fertilizer application continues to be a manual operation.

c) **Weeding** - Manual weeding is slowly giving way to chemical weeding now a days, so that what was a labour intensive component of the production is now no more. On the other hand, with the increasing usage of chemicals for eradication of weeds (as opposed to controlling/ managing of weeds with an emphasis on cost-benefit line of operation). The environmental issues are more relevant in this category of activities.

d) **Pruning** - The average life of a seedling tea plant is well over 50 years, with hybrid types having a life around 40 years. Pruning is important for maintaining the tea bush in the right form and height for growing and plucking. Pruning is also necessary for the removal o branches that are decayed or dead as a result of drought, pests or diseases, thereby ensuring a clean and healthy estate. In practice, pruning is undertaken when the yield of a particular estates is declining.

e) **Other Field Operations** - These include soil conservation measures, control of pests and diseases and sundry activities

f) **Capital Field Development**- This involves three key activities. They are New Planting, Re- Planting and Infilling of vacancies.

g) **Manufacturing** - Approximately 4.5Kg of freshly plucked green leaf is required to manufacture 1 Kg of Black Tea. The technology has been upgraded from the conventional technology, though considerably slowly. Between the two principal methods of manufacturing, Orthodox and CTC (Cut, Tear & Curl), the global demand for the latter has been rising, because of its higher cuppage. And greater acceptability in quick brewing tea bags. Sri Lanka has traditionally been an Orthodox producer. It is pertinent to note that because of the relatively continuous process which CTC entails, the factory labour requirement is just about half that is necessary for orthodox production. *http://www.ilo.org/public/english/dialogue/sector/papers*

Detailed process of manufacturing is given below.

(i) **Withering -** Newly picked leaves are thinly spread to dry during this process. Heated air is forced over the leaves if the climate is not suitable. The main goal of this process is to reduce the water content. By the end of this process, the leaves should be pliable enough to be rolled.

(ii) **Rolling -** From the withering racks, the leaves are now twisted and rolled so that the leaf cells are broken up. Sometimes shaking is done as well. Oils are released with this rolling process that give the tea its distinctive aroma. The leaves can be rolled with machinery or by hand. The juices that are released remain on the leaf; a chemical change will occur shortly.

(iii) **Oxidation -** This is the chemical process where oxygen is absorbed. This process began once the leaf membranes were broken during the rolling process. Oxidation causes the leaves to turn bright copper in color. This process is the main deciding factor whether we have Green, Oolong or Black tea.

(iv) **Drying or Firing -**In this stage the leaves are dried evenly and thoroughly without burning the leaves. Firing the leaves stops the oxidation process.
http://www.enjoyingtea.com/teaprocessing1.html

(B) Rubber Plantation

Rubber is a collective term for macromolecular substances of natural or synthetic origin (natural rubber or synthetic rubber). Natural rubber (abbreviated to NR) primarily comprises polyisoprene and is harvested from the milky white latex of a number of species of plants, which flourish in the tropics, above all from the Spurge family (Euphorbiaceae).
http://www.tis-dv.de/tis_e/ware/kautschuk/naturkautschuk/naturkautschuk.htm

Agricultural dimension of the Rubber Plantation is very much similar to Tea Plantation thus would not be repeated. However, the Manufacturing process of Natural Rubber is given below.

a) **Different types of products** - A distinction is drawn between the following forms of natural rubber:

(i) **Crepes -** Pale crepe rubber is among the highest quality crepes. Coagulation of this high-quality natural rubber is achieved with sodium hydrogen sulfite (NaHSO3). The clean coagulum is washed and milled. This produces sheets between 1.2 and 1.5 mm thick and 24 cm wide. The washing process removes from the coagulum considerable amounts of the serum constituents which can cause rotting. The sheets are dried in drying rooms for 2.5 to 4 days at 37°C or air-dried for 5 to 10 days on drying floors.Excessive temperatures lead to discolored patches in the sheets as a result of oxidation. The sheets are packed as bales and marketed as "thin pale crepe". The 10-mm crepe from Sri Lanka is marketed as "thick pale crepe".

(ii) **Sheets** - Two different types of sheets are distinguished

ADS (air dried sheets)

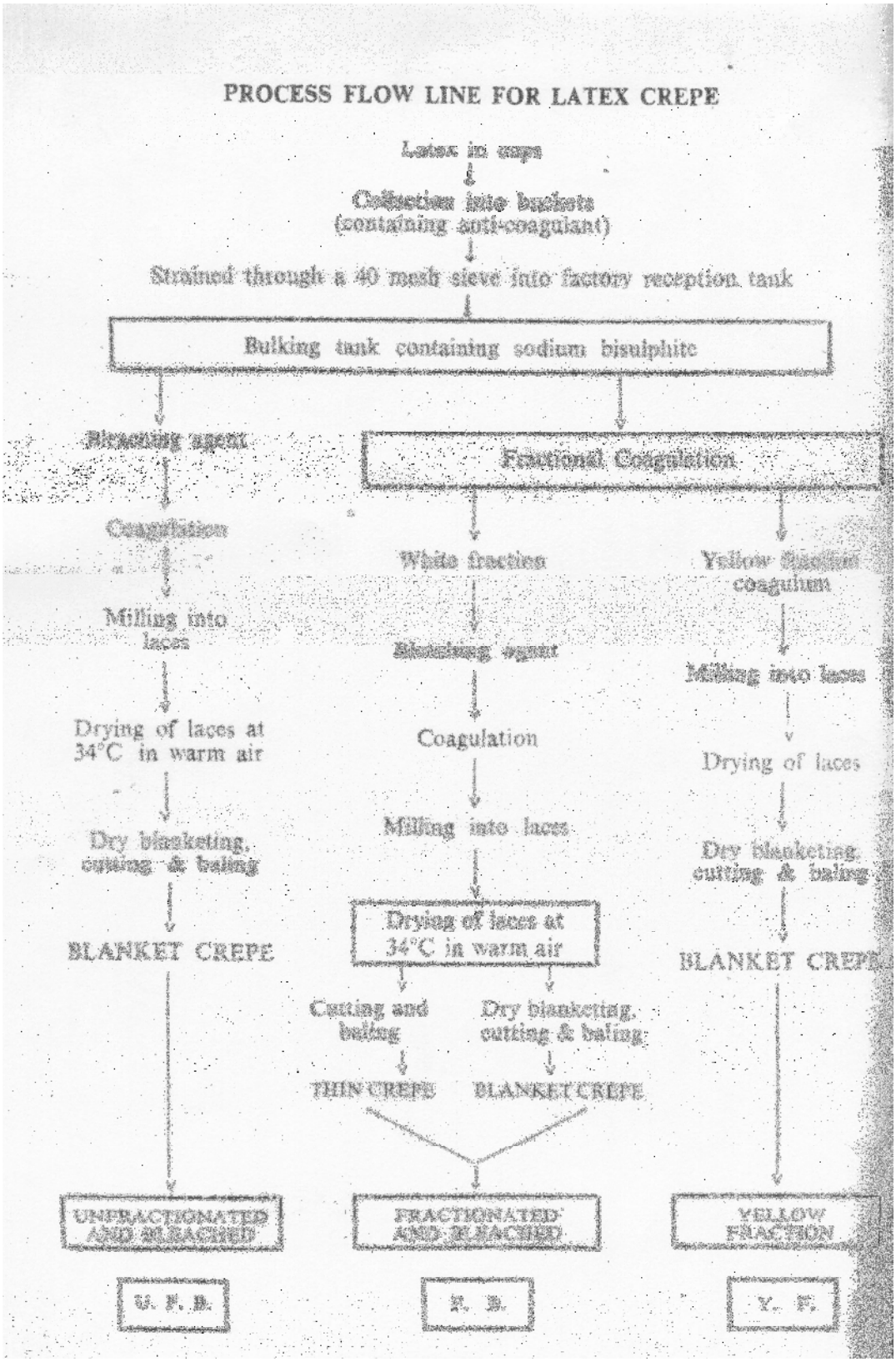
Air dried sheets are less common. They have an appearance similar to RSS (ribbed smoked sheets), but are more transparent, as they are manufactured in smoke-free rooms.

RSS (ribbed smoked sheets)

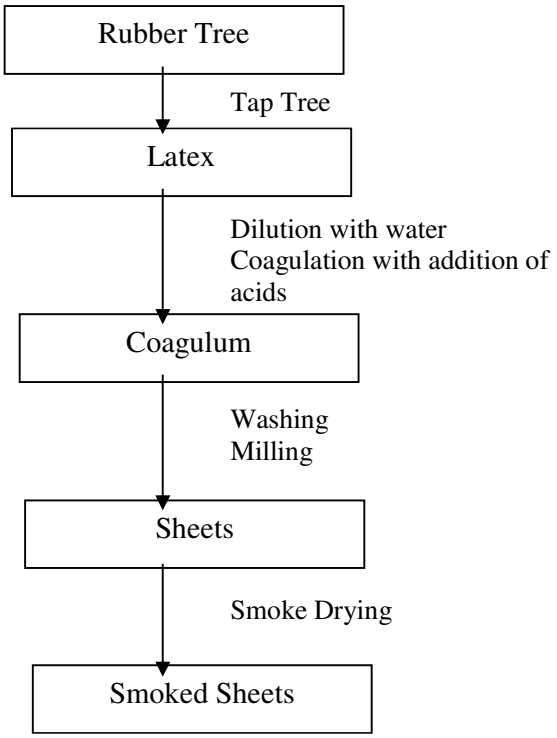
The fresh latex is diluted to a rubber content of 15 - 16% and coagulated in coagulation tanks using formic acid or acetic acid. Lumps of coagulum are formed after the acid has acted for 3-4 hours. After milling and washing, sheets between 2.5 and 3.5 mm thick, 24 cm wide and 90 or 135 cm in length are produced. The final mill is an embossed mill, which gives the sheets their ribbed structure. Since these rubber sheets are not washed as intensively as crepes, they contain a higher proportion of serum constituents which encourage mold and rotting. For this reason, the sheets undergo an additional preservation process in which they are smoked in smokehouses. The sheets are hung in the smokehouses and dried for a week at temperatures up to 60°C. The smoke resulting from burning Hevea (rubber tree) wood and other organic materials such as coconut husks preserves the sheets. The specific smell of these sheets is caused by the materials used to produce the smoke. The sheets are pressed into bales and wrapped in protective sheets. The surface is protected from oxidation by application of a bale coating solution and talcum.

b) The process flow chart for Crepe manufacturing is given below.

Ref :A hand book of Rubber Culture and Processing- Rubber Research (edited by O.S. Peries and D.M. Fernando)


PROCESS FLOW LINE FOR LATEX CREPE
Latex in cups
Collection into buckets (containing anti-coagulant)
Strained through a 40 mesh sieve into factory reception tank
Bulking tank containing sodium bisulphite
Bleaching agent
Fractional Coagulation
Coagulation
White fraction
Yellow fraction coagulum
Milling into laces
Bleaching agent
Milling into laces
Drying of laces at 34°C in warm air
Coagulation
Drying of laces
Dry blanketing, cutting & baling
Milling into laces
Dry blanketing, cutting & baling
BLANKET CREPE
Drying of laces at 34°C in warm air
BLANKET CREPE
Cutting and baling
Dry blanketing, cutting & baling
THIN CREPE
BLANKET CREPE
UNFRACTIONATED AND BLEACHED
FRACTIONATED AND BLEACHED
YELLOW FRACTION
U. F. B.
F. B.
Y. F.

c) Process of Manufacturing of ribbed smoked sheets



http://www.tis-gdv.de/tis_e/ware/kautschuk/naturkautschuk/naturkautschuk.htm

3. Present Legal framework Applicable

3.1. Present legal framework could be sub categorized in to the following areas.

- In relation to Environmental Issues
- In relation to Social Issues

(A) Legislation in relation to Environmental Issues

3.2. Main legislative framework in relation to plantations would be the Central Environmental Authority rules and regulations. The Central Environmental Authority (CEA) was established in August 1981 under the provision of the National Environmental Act No:47 of 1980. The Ministry of Environment and Natural Resources (ME&NR) which was established in December 2001 has the overall responsibility in the affairs of the CEA with the objective of integrating environmental considerations in the development process of the country. The CEA was given wider regulatory powers under the National Environment (Amendment) Acts No:56 of 1988 and No:53 of 2000.

(a) EPL - The prescribed activities for which Environmental Protection License (EPL) is required has been listed under Part "A" and "B" of the schedule of the *Gazette notification no.1159/22 dated 22.11.2000*. Activities in relation to the Plantations companies are listed below.

- Synthetic rubber, natural rubber manufacturing or processing or rubber based industries excluding industries which manufacture 100 Kg or less per day of ribbed Smoke rubber sheets are required to obtain EPL from Central Environmental Authority

- Ribbed smoke rubber sheets manufacturing industries having a production capacity of more than 50 Kilograms per day and less than 100 Kilograms per day are required to obtain EPL from the Local Government Authorities, namely Municipal Councils, Urban Councils and Pradeshiya Sabhas to whom the authority of issuing, monitoring and following up is delegated by CEA.

(b) Waste Water Quality - In addition to the above, CEA has also prescribed the standards for discharge of wastewater into the environment were published in the Gazette Notification No. 595/16 dated 02.02.1990 termed as the *National Environmental (Protection & Quality) Regulations No.1 of 1990.*

1. DISCHARGED STANDARDS BASED ON THE RECEIVING ENVIRONMENT

a) General Standards For Discharge Of Effluent Into Inland Surface Waters

No.	Determinant	Tolerance Limit
1.	Total Suspended Solids, mg/l, max	50
2.	Particle size of total suspended solids	Shall pass sieve of aperture size 850 micro m
3.	pH value at ambient temperature	6.0 to 8.5
4.	Biochemical Oxygen Demand-BOD_5 in 5 days at 20^0 C, mg/l, max	30
5.	Temperature of discharge	Shall not exceed 40^0 C in any Section of the Stream within 25m down stream from the effluent outlet.
6.	Oils and greases, mg/l max	10.0
7.	Phenolic Compounds (as phenolic OH)mg/l. max	1.0
8.	Cyandes as (CN) mg/l, max	0.2
9.	Sulfides, mg/l, max	2.0
10.	Flourides, mg/l, max	2.0
11.	Total residual chlorine mg/l, max	1.0
12.	Arsenic, mg/l, max	0.2
13.	Cadmium total, mg/l, max	0.1
14.	Chromium total, mg/l, max	0.1
15.	Copper total, mg/l, max	3.0
16.	Lead, total, mg/l, max	0.1
17.	Mercury total, mg/l, max	0.0005
18.	Nickel total, mg/l, max	3.0
19.	Selenium total, mg/l, max	0.05
20.	Zinc total, mg/l, max	5.0
21.	Ammoniacal nitrogen, mg/l, max	50.0
22.	Pesticides	Undetectable
23.	Radio active material	
	a. Alpha emitters micro curie/ml	10^{-7}
	b. Beta-emitters micro curie/ml	10^{-8}
24	Chemical Oxygen Demand (COD), mg/l, max	250

Note 1 : All efforts should be made to remove colour and unpleasant odour as far as practicable.

Note 2 : These values are based on dilution of effluents by at least 8 volumes of clean receiving water. If the dilution is below 8 times, the permissible limits are multiplied by 1/8 of the actual dilution.

Note 3 : The above mentioned General Standards shall cease to apply with regard to a particular industry when industry specific standards are notified for that industry.

a) Tolerance Limits For Effluents From Rubber Factories Discharged Into Inland Surface Waters

No.	Determinant	Tolerance Limit	
		*Type I Factories**	*Type II Factories***
1.	pH value at ambient temperature	6.5 to 8.5	6.5 to 8.5
2.	Total suspended solids, mg/l, max	100	100
3.	Total solids, mg/l, max	1500	1000
4.	Biochemical Oxygen Demand (BOD5) in 5 days at 200C, mg/l, max	60	50
5.	Chemical Oxygen Demand (COD) mg/l, max	400	400
6.	Total Nitrogen, mg/l, max	300	60
7.	Ammonical Nitrogen, mg/l, max	300	40
8.	Sulfides, mg/l, max	2.0	2.0

* Type I Factories - Latex Concentrate

** Type II Factories - Standard Lanka Rubber; Crepe Rubber and Ribbed Smoked Sheets

Note I : All efforts should be made to remove colour and unpleasant odour as far as practicable

Note II : These values are based on dilution of effluents by at least 8 volumes of clean receiving water. If the dilution is below 8 times, the permissible limits are multiplied by 1/8 of the actual dilution

(c) **Noise Pollution**- Standards were also gazetted for the control of noise emissions from industries by the Gazette Notification no. 924/12 dated 23.05.1996 termed as National Environmental (Noise Control) Regulations No. 01 of 1996.

SCHEDULE 1

(Regulation 2)

Maximum Permissible Noise Levels at Boundaries in LAeq'T.

Area	LAeq'T	
	Day time	Night Time
Low Noise	55	45
Medium Noise	63*	50
High Noise	70	60
Silent Zone	50	45

* Provided that the noise level should not exceed 60 dB (A) inside existing houses, during day time.

"LAeq 'T' means the equivalent continuous, A- weighted sound pressure determined over a time interval T(in dB).

SCHEDULE II

(Regulation 3)

The following noise levels will be allowed where the background noise level exceed or is marginal to the given levels in Schedule 1.

a) For low noise areas in which the background noise level exceed or is marginal to the given levels	Measured Background Noise level + 3 dB (A)
b) For medium noise areas in which the Background noise level exceeds or is Marginal to the given level	Measured Background Noise level + 3 dB (A)
c) For silent zone in which the background Noise level exceeds or is marginal to the Given level	Measured Background Noise level + 3 dB (A)
d) For high noise areas in which the background noise level exceeds or is marginal to the given level	
For day time	Measured Background Noise Level +5 dB (A)
For Night time	Measured Background Noise Level +3 dB (A)

The above maximum noise levels should be maintained inside the boundary of the land, in which the source noise is located.

(d) **Environmental Impact Assessment (EIA)** - The procedure stipulated in the Act for the approval of projects provides for the submission of two types of reports Initial Environmental Examination (IEE) report and Environmental Impact Assessment (EIA) report. Such reports are required in respect of "prescribed projects" included in a Schedule in an Order published by the Minister of Environment in terms of *section 23 Z of the act in the*

Gazette Extra Ordinary No. 772/22 dated 24th June 1993. Once an EIA report is submitted NEA provides for a public inspection and comment on the report during a mandatory period of 30 days. A public hearing may be held to provide an opportunity to any member of the public (who has submitted his comments) to be heard in support of his comments if the PAA considers it to be in the public interest to do so. A decision whether to approve the project has to be arrived at thereafter. Prescribed projects in relation to planations are as follows.

- Extraction of timber covering land area exceeding 5 hectares
- Conversion of forests covering an area exceeding 1 hectare into non-forest uses.
- Clearing of land areas exceeding 50 hectares.

(e) Control of Pesticides - The *Control of Pesticides Act No. 33 of 1980* provides for the licensing of pesticides; to regulate the import, packaging, labelling, storage, formulation, transport, sale and use; for the appointment of a licensing authority; for the establishment of a pesticide formulary committee. This is the only law in Sri Lanka that deals with classification and labelling of chemicals that are used in the manufacturing of pesticides. Pesticides are classified according to the lethal dose values (LD 50). The labelling regulation specifies the identity of the contents, languages and size of the lettering, danger symbols and colours, precautions during handling, first aid and antidotes etc

(B) Legislation in relation to Social Issues

(a) Child Labour - The minimum age for employment of children was raised from 12 to 14 years in December 1999 by an amendment to the Employment of *Women, Young Persons and Children Act (No. 47), 1956*. At present, the minimum age of employment in all sectors other than the plantation sector is 14 years. Further, through the Ministry of Labour, the legislation has been amended to provide for payment of compensation to victims, by employers violating the minimum age of employment laws.

(b) Compulsory Education - Under the regulations framed in 1997, *under the Education Ordinance of 1940*, Compulsory School Attendance, education and attendance at school were made compulsory for every Sri Lankan child aged between 5 and 14 years.

(c) Registration of a Factory - Under the Factories *Ordinance No.45 of 1942 as amended Section 126(1)* defines a Factory as a premises which employees are employed in manual labour. This requires a Factory to be registered and it would be an offence to be the occupier of any factory unless such factory is registered and licensed.

(d) Health and Safety - The *Factories Ordinance No. 45 of 1942, the subsequent Amendment Act No. 54 of 1961 and Law No. 12 of 1976* is the principal occupational safety and health legislation in the country. It makes provision for safety, health and welfare of workers in factories as defined under the Ordinance. It stipulates the minimum safety standards to be maintained by the employer. The Ordinance deals mainly with machine safety, welfare and safety precautions that should be taken by employers. The sections on health and welfare deal with cleanliness, work area and overcrowding, temperature, ventilation and lighting, sanitary conveniences, consumption of meals within restricted areas, lifting of weights, water for consumption, and first aid.

(e) Overtime - Under the same Ordinance in c) above, previsions are available for overtime employment of women and young persons who are above sixteen but less than eighteen provided that the overtime worked by a woman shall not exceed in aggregate sixty hours in any calendar month and overtime worked by a young person (<16>18 years) , shall not exceed in the aggregate fifty hours in any calendar month. It also does not permit engaging the following persons in overtime.

- A pregnant Woman during her pregnancy
- A nursing mother for a period of one year from the birth of the child
- A woman delivered a still born child for a period of three months.

(f) Wages Board Ordinance No 27 of 1941 as amended.

(g) Trade Union Ordinance

(h) Industrial Disputes Act

(i) Maternity Benefits - The Maternity Benefits Ordinance No 32 of 1939 as amended, which is directly applicable to females working on estates, imposes certain restrictions with regard to employment of pregnant females on certain types of work that could be considered injurious to her, or to her child, and, with regard to termination of their services. The term 'injurious' is not defined clearly in the Act and should, therefore, be interpreted to include any work in the estate or factory of a heavy or arduous nature. The Ordinance also requires an employer of a female employee who is nursing a child under one year of age, to allow her two nursing intervals within the normal working day, at such time as she may require. The Medical Wants Ordinance that covers estate women workers, also prohibits dangerous or heavy work during pregnancy and after confinement on similar lines of the Maternity Benefits Ordinance

(j) Provident Fund - The employer is expected to contribute 12% of the wage/ salary to EPF under the *Employees' Provident Fund (EPF) Act No 15.* The employee has to contribute 8% and it is the obligation of the employer to collect the contributions and remit the contributions to the Central Bank.

(k) Trust Fund - Under the Employees' *Trust Fund (ETF) Act No 46 of 1980 as amended*, an employer is required to contribute 3% of the employee's total earnings to the ETF. There is no contribution from the employee. This contribution should be made to ETF during 30 days of the wage period ending.

(l) Gratuity - An employee who has 5 years uninterrupted and continuous service is entitled to gratuity in terms of the *Payment of Gratuity Act No 12 of 1983 as amended*. The payment is half month's salary or 14 days wages where he has not been on a monthly salary, per year of service.. This act is applicable if there are more than 15 employees.

(m) Termination - New formula for payment of compensation was introduced under the termination of *Employment of Workmen (Special Provisions) Act No 45 of 1971 (order under section 6D)*

(n) Recruitment and Retirement - The minimum age for recruitment shall be 18 years. The normal age of retirement is age 55 years. However extension beyond 55 years can be granted as the discretion of the management. Persons who have attained the age of 16 years but below the age 18 years can be employed, subject to the following conditions.

- Persons under 18 years cannot be employed for more that 50 hours of overtime during any month.
- Persons under the age of 18 years cannot be employed after 10.00 pm and before 6.00 a.m

(o) Forced Labour- No employer shall use any form of forced or compulsory labour.

(p) Child Labour - No employer shall use child labour either directly or indirectly through sub contractors

(q) Equal status - Male and Female workers shall be accorded equal opportunity in employment and occupation and paid equal remuneration for work of equal value.

(r) International conventions -

Sri Lanka has ratified all eight of the ILO's fundamental conventions reflected in the 1998 Declaration on Fundamental Principles and Rights at Work:

- Convention No. 29 on Forced Labor
- Convention No. 87 on Freedom of Association and Protection of the Right to Organize
- Convention No. 98 on the Right to Organize and Collective Bargaining
- Convention No. 100 on Equal Remuneration
- Convention No. 105 on the Abolition of Forced Labor
- Convention No. 111 on Discrimination (Employment and Occupation)
- Convention No. 138 on the Minimum Age for Admission to Employment
- Convention No. 182 on the Worst Forms of Child Labor

Sri Lanka has ratified all of the principal United Nations covenants on human and worker rights:

- International Covenant on Economic Social and Cultural Rights (ICESCR)
- International Covenant on Civil and Political Rights (ICCPR)
- International Convention on the Elimination of all Forms of Racial Discrimination (CERD)
- Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW)
- Convention on the Rights of the Child (CRC)
- International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families

4. Identification of E & S Risks

The E & S risks could be listed as follows.

Environmental Risks	**Social Risks**
Land Use	**Land Use**
1. Large scale land / forests clearing for new planting may adversely effect the ecologically sensitive areas, unique habitats, forests, sites of cultural significance	1. Resettlement of affected population and payment of compensation for the property acquired not being done in a economically and socially justifiable way.
2. Land development and cultivation may not be done according to the accepted techniques / recommended by Tea Research Institute / Rubber research Institute, thus resulting in soil erosion and land slides	
3. *Likely environmental threats from large scale Oil Palm cultivation*	
4. Removal of timber in an unsustainable manner	
Use of Agrochemicals	**Use of Agrochemicals**
1. The agrochemicals could have serious impact on the soil bio diversity	1. Risk from exposure to fertilizers, pesticides and other agro-chemicals (safety precautions are often neglected)
2. The agrochemicals could also pollute the ground and inlands surface water systems.	2. Agrochemicals not being transported / stored safely
3. The use of highly persistent and toxic agrochemicals	3. Non availability of necessary first aid and medical care

	4. Agrochemical applicators not being trained properly
Tea Plucking / Rubber Tapping	**Tea Plucking / Rubber Tapping**
	1. Accidents caused as a result of the terrain in the fields
	2. Poisons due to snake bites (close proximity of tea plants, commencing work early in the morning, poor visibility, lack of protective foot wear,)
	3. Non availability of necessary first aid and medical care
	4. Exploitation of Child/ Women labour
	5. Discrimination
Manufacturing Process	**Manufacturing Process**
1. The excessive noise in the Tea/ Rubber factories	1. Risk from unguarded machinery in the factory
2. Discharge of untreated process wastewater to the environmental / inland surface water systems.	2. Noise related injuries (long term exposure to high audio frequencies)
3. Potential use of Chloroflurorocarbons (CFC's) including halon and other Ozone Depleting Substances (ODS's)	3. Not having adequate ventilation system to control work area temperature and humidity
	4. Unsafe elevated platforms, walkways and stairways, conveyer belts etc
	5. Ungrounded, poorly insulated electrical equipment
	6. Lack of training on work place accidents
	General Health and Safety
	5. Lack of sanitary facilities both at work place as well as at homes
	6. Lack of medical facilities and inadequate level of periodic medical examinations.
	7. Poor level of personal hygiene
	Others
	2. Non payment of statutory contributions to EPF and ETF by the employer
	3. Poor living / housing conditions
	4. Possible seasonal unemployment

SECTOR STUDIES

RUBBER BASED INDUSTRIES

1. Introduction

1.1. Sri Lanka Rubber industry consists of three main sectors namely;

i) *the plantation sector* - grows and harvests latex from trees and converts this latex to processed raw rubber of different types.

ii) *the rubber products manufacturing sector* - converts raw rubber into value added rubber goods.

iii) *the rubber wood value added products* – this is an emerging sector which uses rubber wood as a material resource for manufacturing a wide range of value added wood based products.

1.2. This study involves analysis of Environmental & Social aspects relating to the Rubber Products Manufacturing Sector/Rubber Based Industries.

1.3. Rubber Products Manufacturing Sector can be broadly categorized into two sectors namely ;

i) Latex Rubber Based Products
   i. Household, Medical & Surgical Gloves
   ii. Personal protective wear
   iii. Balloons

ii) Dry Rubber Based Products
   i. Solid Tyres
   ii. Pneumatic Tyres & Tubes
   iii. Tyre re-Trading
   iv. Footwear
   v. Flooring
   vi. Rubber Thread
   vii. Rubber Hose
   viii. Unhardened Rubber
   ix. Rubber Belts & Accessories

2. Industry Description and Practices

2.1. Sri Lanka is the world's ninth largest producer and the tenth largest exporter of natural rubber (NR). It is also the major supplier of high quality latex crepe to the world market and the world's largest manufacturer and exporter of solid tyres for off-road-vehicles.

2.2. The rubber products manufacturing industry emerged in the 1950s primary to retread tyres and the industry expanded rapidly after the introduction of free trade policies and investment promotion zones in the late 1970s.At present, it is five times greater than the export value of raw rubber from Sri Lanka. However, the plantation sector remains an important component as it is the ‘resource base’ or the primary competitive advantage of Sri Lanka’s rubber industry.

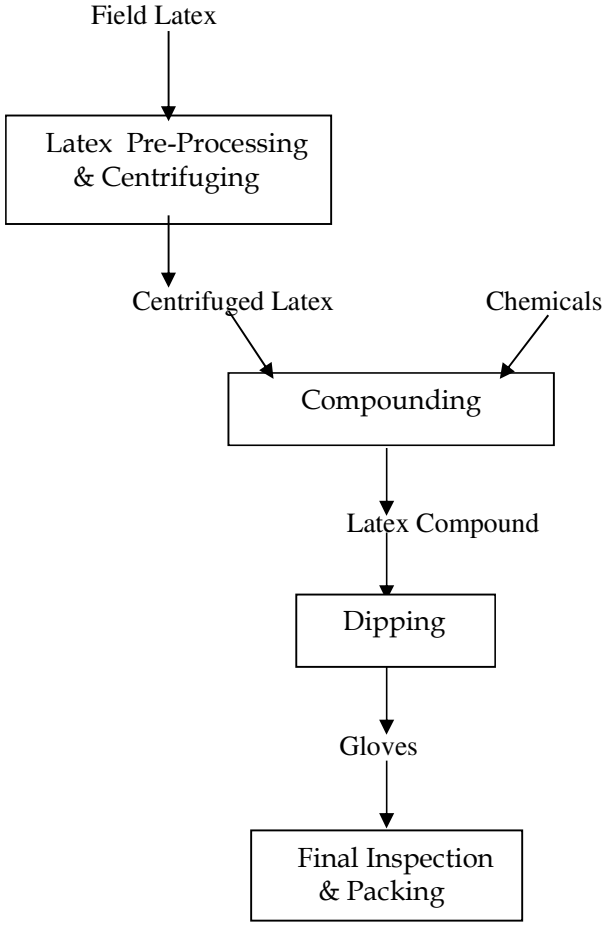
2.3. The local consumption of raw rubber for value addition was high which was approx. 70% of local production in the recent past. The bulk of these value-added products are for the export market.

3. Industry Practices

a) Latex Rubber Processing – Process flow involved in latex rubber processing (ie manufacturing of gloves) is briefed below.

- Field Latex is the protective fluid contained in the tissue of the rubber tree which is the basic raw material used for Rubber processing.
- Raw rubber processing involves 3 main steps namely ; Latex pre-processing, centrifuging and compounding.
- **Pre-processing** : Field latex is bulked and ammoniated by adding Ammonia. Ammonia is added to preserve the field latex before it arrives at the processing plant.
- At the processing plant further Ammonia is added before the latex is processed in the centrifuged.
- **Centrifuging** : Centrifuge process separates the field latex into concentrate (min. 60% - dry rubber content) and skim latex(3-6% - dry rubber content). It also removes non rubber suspended matter from the latex.
- **Compounding** : This involves mixing of centrifuged latex with compounding materials which is in the water dispersion form. Latex is compounded in its natural liquid form in order to make it more evenly distributed with compound materials to generate a product with greater tear resistance and superior physical properties.
- Latex compound is then send through the dipping plant for dipping which will then generate the final product.(ie Gloves, condoms & balloons)

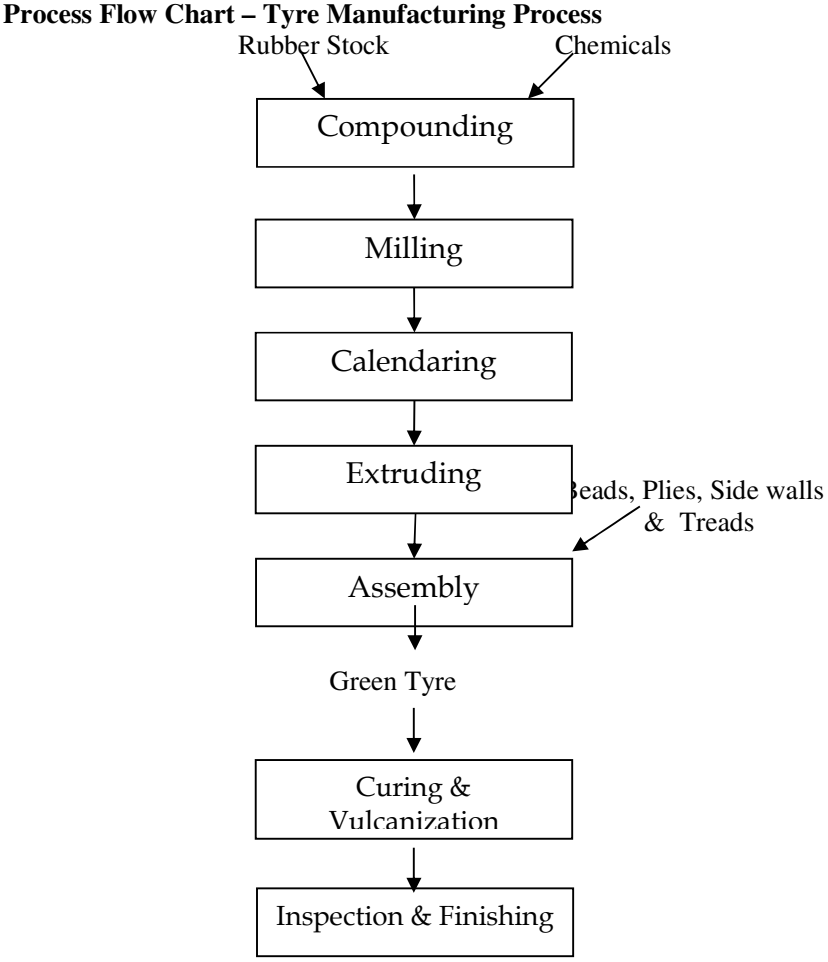
Process Flow Chart – Glove Manufacturing Process



b) Dry Rubber Processing – Process involved in dry rubber processing (ie manufacturing of tyres) is briefed below.

- Skim rubber(ie 3-6% - dry rubber content) is further processed to skim rubber(dry) by deammoniation, acid coagulation, creping and drying.
- **Mastication** : Rubber stock is passed through rollers that shear and break down the polymer chains.
- **Compounding** : Compounding ingredients are then added and forced into the stock as it passes between the rollers, in order to create a homogenous rubber material.
- Compounding ingredients added in the compounding process include Carbon Black, accelerators, anti-oxidants, anti-ozonants, extenders, vulcanizers, pigments, reinforcing agents and resins.
- **Milling** : Shaping of rubber is done in the milling process. At the completion of the banbury mixing cycle, rubber is placed onto a drop mill where the rubber is shaped into flat, long strips.
- **Calendaring :** This operation continues to reshape rubber. Calendar machine prepares compounded rubber as a uniform sheet of definite thickness & width and place a thin coat of rubber on a fabric – 'Coating/Skimming'. It also forces rubber into the interstices of fraction by friction – 'Frictioning'.
- **Extruding :** Extruder forces rubber through dies of appropriate shape and makes large, flat section of tyre treads.
- **Component assembly and building :** This is a highly automated process which involves assembly of components namely beads, plies, side walls and treads. – 'green tyre'.
- **Curing and Vulcanizating :** Rubber curing and vulcanization transforms the tacky and pliable material to a non-tacky, less pliable, long lasting state. Curing presses utilize steam to heat or cure the green tyre.
- **Inspection and finishing :** Following curing, finishing operation and inspection is performed. The finishing operation trims flash or excess rubber from the tyre

Process Flow Chart – Tyre Manufacturing Process



4. Present Legal Framework applicable

(A) Legislation in relation to Environmental Aspects

4.1. The main body governing the environmental aspects relating to the rubber based industries is the Central Environmental Authority (CEA). Under the provisions of National Environmental Act No. 47 of 1980 as amended by the Amendments Acts No 56 of 1998 and No 53 of 2000 the prescribed activities for which Environmental Protection License (EPL) is required has been listed under Part "A" and "B" of the schedule of the Gazette notification no.1159/22 dated 22.11.2000.

4.2. Activities in the rubber based products sector which needs to obtain EPL are as follows;

- ***Synthetic rubber, natural rubber manufacturing or processing or rubber based industries excluding industries which manufacture 100 Kg or less per day of ribbed Smoke rubber sheets***.- Requires to obtain EPL from Central Environmental Authority

- ***Ribbed smoke rubber sheets manufacturing industries having a production capacity of more than 50 Kilograms per day and less than 100 Kilograms per day***. – required to obtain EPL from the Local Government Authorities, namely Municipal Councils, Urban Councils and Pradeshiya Sabahas to whom the authority of issuing, monitoring and following up is delegated by CEA.

4.3. In addition to the above, CEA has also specified standards for the following;

(a) **Tolerance Limits for Effluents from Rubber factories Discharged into Inland Surface Waters –** Gazette Notification No. 595/16 dated 02.02.1990 termed as the National Environmental (Protection & Quality) Regulations No.1 of 1990.

No	Determinant	Tolerance Limit	
		Type I Factories *	**Type I Factories ****
1	pH value at ambient temperature	6.5 – 8.5	6.5 – 8.5
2	Total suspended solids, mg/l, max	100	100
3	Total solids, mg/l, max	1500	1000
4	Biochemical Oxygen Demand(BOD5) in 5 days at 200c, , mg/l, max	60	50
5	Chemical Oxygen Demand(COD), mg/l, max	400	400
6	Total Nitrogen, mg/l, max	300	60
7	Ammonical Nitrogen, mg/l, max	300	40
8	Sulfides, mg/l, max	2.0	2.0

* Type I factories – Latex Concentrate
** Type II factories – Standard Lanka Rubber, Crepe Rubber and Ribbed Smoked Sheets

Note I : All efforts should be made to remove colour and unpleasant odour as far as practical.

Note II: These values are based on dilution of effluents by at least 8 volumes of clean receiving water. If the dilution is below 8 times, the permissible limits are multiplied by 1/8 of the actual dilution.

(b) **Ambient Air Quality Standards** – Gazette Notification No. 11-193/1, 2A-D 034203 (94/10) dated 05.10.1994 National Environment (Ambient Air Quality) Regulation 1994 –

Ozone Depleting Substances and National Environmental (Ambient Air Quality) Regulations 1994

Pollutant	Averaging Time*	Maximum Permissible Level		Method of Measurement
		In mg/m3	In ppm	
Carbon Monoxide	8 hr.	10.0	9.0	Non-dispersive infrared spectroscopy
	1 hr.	30.0	26.0	
	Any Time	58.0	50.0	
Nitrogen Dioxide	24 hr.	0.10	0.05	Coloring using Saitzman method or equivalent (gas phase chemiluminescence)
	8 hr.	0.15	0.08	
	1 hr.	0.25	0.13	
Sulfur Dioxide	24 hr.	0.08	0.03	Pararosaniline method of equivalent (pulsed fluorescent method)
	8 hr.	0.12	0.05	

	1 hr.	0.20	0.08	
Ozone	1 hr.	0.20	0.10	Chemiluminescence method or equivalent (UV photometric method)
Lead	Annual	0.0005	-	Hi-volume sampling, wet ashing /atomic absorption or spectroscopy
	24 hr.	0.002	-	
Suspended Particulate Matter(SPM)	Annual	0.10	-	Hi-volume sampling & Gravimetric
	24 hr.	0.30	-	
	8 hr.	035	-	
	3 hr.	0.45	-	
	1 hr.	0.50	-	

* Minimum number of observations required to determine the average over the specified period:

03 hour average – 03 consecutive hourly average
08 hour average – 06 hourly average
24 hour average – 18 hourly average
Yearly average – 09 monthly averages with at least 02 monthly average each quarter.

By wet chemistry methods or by automated analysis.

(c) **Permissible Noise Levels** - Gazette Notification No. 924/12 dated 21.05.1996 National Environment (Noise Control) Regulation No. 1 1996

SCHEDULE 1

(Regulation 2)

Maximum Permissible Noise Levels at Boundaries in LAeq'T.

Area	LAeq'T	
	Day time	Night Time
Low Noise	55	45
Medium Noise	63*	50
High Noise	70	60
Silent Zone	50	45

* Provided that the noise level should not exceed 60 dB (A) inside existing houses, during day time.

"LAeq 'T' means the equivalent continuous, A- weighted sound pressure determined over a time interval T(in dB).

SCHEDULE II

(Regulation 3)

The following noise levels will be allowed where the background noise level exceed or is marginal to the given levels in Schedule 1.

a) For low noise areas in which the background noise level exceed or is marginal to the given levels	Measured Background Noise level + 3 dB (A)
b) For medium noise areas in which the Background noise level exceeds or is Marginal to the given level	Measured Background Noise level + 3 dB (A)
c) For silent zone in which the background Noise level exceeds or is marginal to the Given level	Measured Background Noise level + 3 dB (A)
d) For high noise areas in which the background noise level exceeds or is marginal to the given level	
For day time	Measured Background Noise Level +5 dB (A)
For Night time	Measured Background Noise Level +3 dB (A)

The above maximum noise levels should be maintained inside the boundary of the land, in which the source noise is located.

(d) **Waste Handling Regulations -** Gazette Notification No. 924/13 dated 25.04.1996 National Environment (Protection & Quality) Regulation No. 1 1990

(B) Legislation in relation to Social Aspects

Legislation applicable to all enterprises and workers including Free Trade Zones whether owned by nationals or non-nationals are governed mainly by;

(a) **Factories Ordinance No. 45 of 1942** - safety and welfare of the factory workers.

(b) **Shop & Office Employees (regulation of Employment & Remuneration) Act No.19 of 1954 as amended**; - safety and welfare of administrative clerical staff

(c) **Wages Boards Ordinance No. 27 of 1941 as amended** - prescribe minimum wages and other conditions namely holiday, leave and overtime rates for the relevant trades.

(d) **Child Labour** -*An amendment to the Employment of Women, Young Persons and Children Act (No. 47), 1956.*The minimum age for employment of children was raised from 12 to 14 years in December 1999. At present, the minimum age of employment in all sectors other than the plantation sector is 14 years. Further, through the Ministry of Labour, the legislation has been amended to provide for payment of compensation to victims, by employers violating the minimum age of employment laws.

(e) **Forced Labour** - No employer shall use any form of forced or compulsory labour.

(f) **Equal status** - Male and Female workers shall be accorded equal opportunity in employment and occupation and paid equal remuneration for work of equal value.

(g) **Compulsory Education** -*Education Ordinance of 1940,* Compulsory School Attendance, education and attendance at school were made compulsory for every Sri Lankan child aged between 5 and 14 years.

(h) **Registration of a Factory** - *Factories Ordinance No.45 of 1942 as amended Section 126(1*) defines a Factory as a premises which employees are employed in manual labour. This requires a Factory to be registered and it would be an offence to be the occupier of any factory unless such factory is registered and licensed.

(i) **Overtime** - *Under the same Ordinance in c) above,* provisions are available for overtime employment of women and young persons who are above sixteen but less than eighteen provided that the overtime worked by a woman shall not exceed in aggregate sixty hours in any calendar month and overtime worked by a young person (<16>18 years) , shall not exceed in the aggregate fifty hours in any calendar month. It also does not permit engaging the following persons in overtime.

- A pregnant Woman during her pregnancy
- A nursing mother for a period of one year from the birth of the child
- A woman delivered a still born child for a period of three months.

(j) **Provident Fund** - *Employees' Provident Fund (EPF) Act No 15. -* The employer is expected to contribute 12% of the wage/ salary to EPF. The employee has to contribute 8% and it is the obligation of the employer to collect the contributions and remit the contributions to the Central Bank.

(k) **Trust Fund** - *Employees' Trust Fund (ETF) Act No 46 of 1980 as amended*, -An employer is required to contribute 3% of the employee's total earnings to the ETF. There is no contribution from the employee. This contribution should be made to ETF during 30 days of the wage period ending.

(l) **Gratuity** – *Payment of Gratuity Act No 12 of 1983* - An employee who has 5 years uninterrupted and continuous service is entitled to gratuity in terms of the above Act. The payment is half month's salary or 14 days wages where he has not been on a monthly salary, per year of service. This act is applicable if there are more than 15 employees.\

(m) **Termination** – *Employment of Workmen (Special Provisions) Act No 45 of 1971 (order under section 6D)* New formula for payment of compensation was introduced under the termination of the above Act.

(n) **Recruitment and Retirement -** The minimum age for recruitment shall be 18 years. The normal age of retirement is age 55 years. However extension beyond 55 years can be granted as the discretion of the management. Persons who have attained the age of 16 years but below the age 18 years can be employed, subject to the following conditions.

- Persons under 18 years cannot be employed for more than 50 hours of overtime during any month.
- Persons under age of 18 cannot be employed after 10.00 p.m. and before 6.00 a.m

(o) Sri Lanka has ratified all eight of the ILO's fundamental conventions reflected in the 1998 Declaration on Fundamental Principles and Rights at Work:

- Convention No. 29 on Forced Labor
- Convention No. 87 on Freedom of Association and Protection of the Right to Organize
- Convention No. 98 on the Right to Organize and Collective Bargaining

- Convention No. 100 on Equal Remuneration
- Convention No. 105 on the Abolition of Forced Labor
- Convention No. 111 on Discrimination (Employment and Occupation)
- Convention No. 138 on the Minimum Age for Admission to Employment
- Convention No. 182 on the Worst Forms of Child Labor

5. Environmental & Social Risks

(A) Environmental Risks

5.1. **Risk of water streams being contaminated by organic and inorganic materials**.
Effluents generated in skim recovery at latex centrifuging and milling stages contain high concentration of organic and inorganic materials. The organic matter(ie proteins) decomposes through the action of bacteria, which gives rise to noxious gases such as Hydrogen Sulphide, produce foul odours and develops a dirty appearance in streams.

5.2. **Risk of ground water systems being contaminated by chemicals and effluents**.
Leaching water produced in the dipping process in gloves manufacturing operation contains Nitrates, Zinc etc and washing of gloves release Chlorides & Sulfates which cause contamination of ground water systems.

5.3. **Risk of septic water contaminating ground water/water streams**.
Improper septic water disposal systems can cause leaking of septic water to ground water or surrounding water bodies.

5.4. **Risk of air pollution caused by pollutants released at various stages of rubber products manufacturing factories**.
Ammonia fumes generated in latex centrifugation stage and chlorine fumes emitted in dipping stages can cause air pollution. Especially chlorine fumes contain chlorine molecules which is a Ozone layer depleting material.

5.5. **Risk of air pollution caused by equipments used at various stages of rubber products manufacturing operation**.
Boilers/heaters and electrical generators used to generate energy can emit excessive level of heat, pressure, soot/smoke and combustion by–products such as Sulfur Dioxide, Nitrous Oxide, Carbon Monoxide to the atmosphere.

5.6. **Risk of contamination of soil by chemicals and by-products**.
Storage of sludge generated in the milling/processing of skim can cause contamination of soil. Coagulated compound generated in compound preparation stage of rubber products manufacturing operation contains centrifuges latex and various chemicals which can cause soil pollution.

5.7. **Risk of soil pollution by solid waste generated in rubber products manufacturing factories.**
Scrap and rejects, waste flock(ie cotton), broken ceramic formers in rubber glove manufacturing process can deposit on soil causing soil pollution. Trimmings, particulate matter, waste Polythene and cartons some of which are non bio degradable in nature can remain in soil for long periods.

5.8. **Risk of noise pollution.**
Heavy machines used by rubber products manufacturers can generate continuous or intermittent noise which may be harmful to the surrounding.

5.9. **Risk of inhalation**.
Inhalation of potentially hazardous chemicals and exposures to different types of dust can create health hazards in workers employed at factories.

5.10. **Risk of dermal contact hazards**.
Various types of hazardous materials used in rubber products manufacturing factories can generate exposure hazards to workers through direct skin contact of liquid, solid, vapour, dust or waste.

5.11. **Risk of land acquisition through illegal practices**.

5.12. **Risk of flooding/earth slips in constructions carried out in filled lands**.

(B) Social Risks

5.13. **Child Labour** – Abuse of child labour.

5.14. **Forced labour** - Risk of using forced labour and the risk of not having proper disciplinary practices.

5.15. **Discrimination** - Possibility of discrimination at work place.
- Does the company has a policy/regulation to prevent discrimination?
- What is the company policy on maternity leave?
- Do employees have a confidentiality counselor for sexual or other harassment?

5.16. **Remuneration**
- Does the company follow Wages Board Ordinance in deciding the minimum wages to be paid ?
- What is the system of payment for each category(per hour, day, week etc) and is it inline with the industry norm?

5.17. **Hours Worked**
- Does the actual hours worked per week and the number of working hours are within the limits specified by the Factories Ordinance and Shop & Office Ordinance?

5.18. **Health and Safety**
- Does the company has a written Occupational Health and Safety program in place?
- Does the company comply with the health and safety standards laid down by the Factories Ordinance and Shop & Office Ordinance?
- Does the company has an emergency Preparedness & Response Plan in place? Has this been communicated to every level of staff.
- Are all electrical installations properly earthed /insulated /watertight/explosive- proof.
- What measures has been taken to deal with the risk of fire.
- What measures will be taken to deal with the risk of explosions and in relation to the occurrence and handling of dust, volatile flammable etc.
- What preventive and/or protective measures have been taken to safeguard machinery and other equipment used by employees.
- What preventive and/or protective measures have been taken to prevent exposure of employees to pressure and/or electromagnetic field/ radiation.

- Are workers given gloves, masks, goggles etc
- Are workers trained adequately to handle hazardous substances such as chemicals.
- What preventive and/or protective measures will be taken to prevent contact substances that pose a health hazard (inhalation, potential eye damage, skin contact etc).
- Are the available sanitary facilities adequate?

5.19. **Retrenchment**

- Does the company has a retrenchment policy?

5.20. **Resettlement** – Is there a risk of unsatisfactory resettlement arrangements?

5.21. **Relocation** – Is there a risk of relocation due to unavailability of land for expansion or the land being located in a residential area?

SECTOR STUDIES

TEXTILES AND GARMENTS SECTOR

1. Introduction – Key Industry Highlights

1.1. The textiles and garments sector has been a significant contributor to Sri Lanka's economy over the past several years and is the second highest income earner. According to statistics released by the Central Bank the garments sector contributed 46% of the total exports of the country while 58% of the total industrial exports for 2006 was from the textile, wearing apparel and leather products sectors.

1.2. Recognizing the enormous potential the textile and apparel sector has in the SL'n economy, the government has initiated the 'Nipayum Sri Lanka 300 Enterprises Programme'. The development of the Thulhiriya Textile Complex is expected to expand production capacity of the sector as well.

1.3. Sri Lanka's key markets for apparel exports are the USA and the EU. USD 1,445 Mn. was earned by way of exports to these countries in the first six months of 2007. In terms of value SL has a market share of a mere one 1% of the global market share for apparel exports. The abolition of the MFA has meant increase in competition in the global market place. However, despite this SL was able to record a 6.4% growth in 2006 in the sector. Major firms in SL have adapted to this change successfully by focusing on high value products, enhancing productivity, rationalizing cost of production, enhancing supply chain management and developing forward and backward linkages.

1.4. The NDB's exposure to the textile and garment sector is approximately Rs. 7.76 Bn and is 8% of the total exposure of the Bank.

2. Sub-sector categorization

2.1. The textiles and garments sector can be sub categorized in to the following:

- Fibre and Textiles
- Apparel
- Accessories
- Yarn
- Footwear

(A) Fibre and Textiles

(a) Description

2.2. The textile and fibres sector uses vegetable fibres such as cotton, animal fibres such as wool and silk. The use of a wide range of synthetic materials such as nylon, polyester and acrylics is also common.

2.3. The production of natural fibres is approximately equal in amount to the production of synthetic fibres.

2.4. The stages of textile production are detailed below:

- Fibre Production
- Fibre processing and spinning
- Yarn preparation
- Textile production

(b) Processors

2.5. Processors involved in the production of textiles are as follows:

(i) Weaving / spinning or knitting fabric

(ii) This involves the weaving of yarn in to textiles/fabric. Woven fabric is generally used for formally wear while knitted textiles are produced for is

(iii) Washing of textiles produced prior to processes such as bleaching and dyeing

(iv) Bleaching is performed where the textile has to be died. This ensures that at the dyeing stage the colour requirement is met evenly for the roll of textile.

(v) Dyeing involves blending and matching colour requirements of buyers in dyeing the fabric.

(vi) Printing is the process by which designs are made on the fabric.

(vii) Finishing and **packaging** the end product.

(B) Apparel/Garments

(a) Description/Processors

2.6. Description / Processors of Apparel / garments is given below.

(i) Manufacture of garments involves the stitching of clothes from textiles. (Process for textiles described above) Typical garments produced would cover a wide range including gents, ladies' and childrens wear such as bottoms, tops, pants, shorts, lingerie, nightwear etc

(ii) Washing- Finished garments as per requirements of buyers' trends. Washing techniques include enzyme washing, stone washing, sand blasting, spraying and brushing

(iii) Bleaching- Finished garments such as jeans to give it and 'old' look

(iv) Scouring – Finished garments to give items of clothing such as jeans and shorts a ragged/damaged look.

(v) Accessorizing – Fixing of accessories such as buttons/laces ect… as per buyer requirements

(vi) Embellishments – Embroidery designs such as be logos or trade marks on the garments

(C) Accessories

Involves the production of accessories for garments. Typically this would cover elastic, buttons, laces, belts, webbing, buckles, tapes, flowers and motifs, cords and toggles, brooches etc…

3. Legal and Regulatory Framework

Sri Lankan legislation applies to all enterprises and workers in Sri Lanka including those in the Free Trade Zones whether owned by nationals or non-nationals. Enterprises carrying on the garment manufacturing trade are governed primarily by –

(e) Factories Ordinance No. 45 of 1942 as amended, which provides for the safety and welfare of workers in the factories. Annex 1
(f) Wages Board Ordinance No 27 of 1941 as amended.
(g) Holidays Act No 29 of 1971
(h) Employees Provident Fund Act No 15
(i) Employees Trust Fund Act No 46 of 1980 as amended
(j) Payment of Gratuity Act No 12 of 1983 as amended
(k) Termination of Employment of Workmen Special Provisions Act No 45 of 1971
(l) Shop & Office Employee (Regulation of Employment and Remuneration) Act No 19 of 1954 as amended.
(m) (I) BOI Manual on Labour Standards and Employment Relations
(n) National Environmental Act (Amendment) No 56 of 1988– Tolerance Limits for effluents from Textile Industry Discharged in to the Inland Surface Waters Annex ii
(o) Gazette Notification No 924/12 dated 23.05.1996 as termed National Environmental (Noise Control) Regulations No. 01 of 1996
(p) National Environmental (Protection and Quality) Regulations No1 of 1990

Schedule A

BRIEF REGULATORY LABOUR GUIDELINES

(A) Factories Ordinance No 45 of 1942 as amended

1. Definitions

Section 126(I) defines a Factory in the following broad terms :

A factory means any premises in which persons are employed in manual labour in any process for or incidental to any of the following purposes :-

(d) the making of an article or any part of an article; or
(e) the altering, repairing, ornamenting, finishing, cleaning or washing or breaking up or demolition of any article; or
(f) the adapting for sale of any article.

The definition also covers work close to such premises or within the precincts or curtilage of which work is carried on by way of trade or for the purposes of gain and to or over which the employer of the persons employed has the right of access or control.

The definition also includes the following premises, which may be relevant to a garment factory in which work is carried out.

(a) Any premises in which the business of sorting any articles is carried on as a preliminary to the work carried on in any factory or incidentally to the purposes of any factory.
(b) Any premises in which the business of washing or filling of bottles or containers or packing articles is carried on incidentally to the purposes of any factory etc etc.

2. Registration

The Factories Ordinance requires a factory to be registered and it is an offence to be the occupier of any factory, whether established before or after the appointed date, unless such factory is registered and licensed in accordance with the provisions of the Ordinance and Regulations made thereunder. This rule applies both to the construction of a factory as well as the extensions to existing factories and conversion of existing buildings into factories. It is obligatory that prior to the construction or alteration, the site at which such construction or modification is to be done, be approved by the Chief Inspecting Engineer or the District Factory Inspection Engineer nominated by the Commissioner of Labour for the purpose of reporting on the structural worthiness of the factory building.

3. Further Amendments

A bill amending Section 68 of the Ordinance has been passed in Parliament and published in the Government Gazette on 8th July 2002.

Section 68 of Chapter 128 is amended as follows :

i) By the repeal of subsection (1) of that section and the substitution therefore of the following subsection:-

"(1) notwithstanding the provisions of this part relating to the hours worked and periods of employment, pressure of work in factory may be dealt with by the overtime employment of women and young persons who have attained sixteen years of age but have not attained eighteen years of age:

Provided that the overtime worked by a woman shall not exceed in the aggregate sixty hours in any calendar month and overtime worked by a young person who has attained the age of sixteen years but not attained the age of eighteen years, shall not exceed in the aggregate fifty hours in any calendar month.

ii) By the repeal of paragraph (a) of subsection (2) of that section, and the substitution therefore, of the following paragraph:-

(a) The total number of hours worked, including overtime, by a woman or young person, exclusive of intervals allowed for meals and rest, shall not exceed sixty hours in any week.

iii) By the insertion immediately after subsection (2) of that section of the following new subsection :-

"2(a) an employer shall not engage in overtime –

(a) A pregnant woman during her pregnancy; and
(b) A nursing mother, for a period of one year calculated from the date of the birth of the child; and
(c) A woman delivered of a still born child, for a period of three months calculator from the date of such still birth.

Unless she expresses her consent to engage in such overtime, in writing: and

(B) Wages Board Ordinance No : 27 of 1941 as amended

Wages Boards under the Wages Boards Ordinance as amended is a method of prescribing minimum wages and a few other conditions such as holidays, leave and overtime rates for the relevant trades.

The Wages Board for the Garment Manufacturing Trade lays down the minimum wages payable, overtime rates, leave, holidays and payments of special allowances. *(The current Wages Boards Ordinance Notification for the Garment Manufacturing Trade is reproduced on this page and pages Nos 75, 76, 77 and 78).*

Wages are fixed by Wages Boards on the basis of tripartite discussions and voting at meetings of the relevant Board. Where a monthly rate has been determined an employer can still place workers on a piece rate but he would have to ensure that the minimum monthly rate is paid to the employee.

Any employee called upon to wait for work is entitled to payment of his full wages for that period. However, this does not apply to employees who are present on the premises by reason only of the fact that they reside on the premises of the employer.

Wages have to be paid within 3 days of the expiry of the wage period if the wage period does not exceed one week; if the wage period is 2 weeks within 5 days; and where the wage period is one month within 10 days of the expiry of the month.

Garments Manufacturing Trade Notifications Orders etc. - Decision dated 14.07.2000.

(A) It is hereby notified under Section 29(3) of the Wages Boards Ordinance (Chapter 136) that the decisions of the Wages Board for the Garments Manufacturing Trade made under Section 30 of that Ordinance and specified in the Schedule hereto have been approved by the Minister of Labour.

ORDER

The provisions of Part II of the Wages Boards Ordinance (Chapter 136) shall apply to the following trade,

The Garments Manufacturing Trade, that is to say,

The manufacture of readymade garments, underwear and machine hand embroidery including the work of the following workers :-

1. Leaders or section supervisors;
2. Laying out men;
3. Designers;
4. Cutters;
5. Boilers and menders;
6. Tailors;
7. Cutter (hand)
8. Checkers and sorters;
9. Odd job operatives (females);
10. Stamping operatives (females);
11. Sewing machine operators;
12. Ironing operates;
13. Electric iron operators;
14. Final checkers;
15. Issuing operatives (females);
16. Packers;
17. Cellophane bags and cardboard box makers;
18. Any other workers employed in the manufacture of readymade garment and underwear;
19. Embroidery machine/hand operators;
20. Design punchers;
21. Disket makers;

But excluding the work of the following workers :-

(a) clerks, cashiers, store-keepers, time-keepers, watchers and caretakers;
(b) workers in the Motor Transport Trade, specified in the Order published in Gazette No 9481 of November 2, 1945; and
(c) workers in the Engineering Trade, specified in the Order published in Gazette No. 9224 of January 7, 1944 as subsequently amended.

SCHEDULE

The decision made by the Wages Board for the Garment Manufacturing Trade, and set out in the schedule to the notification published in Gazette extraordinary No. 14688 of 25th March 1966 as varied from time to time and last varied by Notification in Gazette Extraordinary No. 1024/16 of 23rd April 1998, shall be further varied by the substitution for Part II of that Schedule of the following new part.

PART II

The minimum rate of wages for the month

Class of workers :

Grade I

(b) Designers, Tailors, Design Punchers, Discket Makers,
(c) Leaders or Section Supervisors

Grade II

Cutters, Cutters (hand): Machine Minders, Final Checkers

Grade III

Checkers and Sorters, Ironing operators (Male), Odd job operators (Female), Sewing Machine Operators, Electric Iron Operators, Issuing Operators (Female), Embroidery Machine Hand Operators

Grade IV

Laying out men, Laying out women, Packers, Cellophane Bags and Cardboard Box Makers, Unskilled Workers and Stores Labourers.

Grade V

Learners and Apprentices
The period of apprenticeship in relation to any trade learner or apprentice referred to above shall be deemed to consist of 156 working days.

Rates of Wages (in SL Rs)

Year of Employment	Grade					
	1 – A	1 – B	II	III	IV	V
1st year	3,480	3,450	3,335	3,306	3.250	2,645
2nd year	3,515	3,480	3,360	3,326	3.265	
3rd year	3,550	3,510	3,385	3,346	3,280	
4th year	3,585	3,540	3,410	3,366	3,295	
5th year	3,620	3,570	3,435	3,386	3,310	

PART III
Overtime

In respect of each hour of work in excess of the normal working day, the overtime rate shall be the hourly rate (ascertained by dividing the monthly rate by 200) increased by 50 percentum of such hourly rate: and in respect of any part of an hour of work in excess of the normal working day the overtime rate shall be computed proportionately.

PART IV
Weekly Holidays, Section 24

Every employer shall allow each Sunday as the weekly holiday to all workers employed under him. Provided, however, that an employer may employ any worker on such Sunday subject to the following conditions :-

(6) That a day within six days next succeeding such Sunday shall be allowed to that worker as a holiday; and
(7) That in respect of work done on a Sunday that worker shall be paid as remuneration :-

(a) The minimum rates of wages for normal working days (ascertained by dividing the monthly rate by 26) increased by 50 percentum of such minimum rate for the first 9 hours (inclusive of one hour for a meal or rest); and
(b) 100 percentum of the minimum hourly rate (ascertained by dividing the minimum monthly rate by 200) for each subsequent hour of work.

(8) The remuneration due to a worker for work done on a Sunday during any period shall be paid along with the wages payable for that period.

PART V

Please refer to Para (E) for full information of the public holidays for the purpose of the garment manufacturing trade and the public and bank holidays for all purposes.

Annual Holidays, Section 25

(1) If a worker has been in continuous employment and has worked under the same employer for more than 218 days in any year (hereinafter called the "qualifying year") he shall be allowed in the next succeeding year a holiday or holidays, calculated at the rate of one holiday for each unit of 4 days by which the number of days on which the worker has worked exceeds 218 days.

Provided, however, that it shall not be obligatory on an employer to allow any such holiday in respect of any period of work in excess of 274 days.

In this paragraph "days on which a worker has worked" includes :-

(g) every holiday allowed by the employer that worker under Section 25 of the Wages Boards Ordinance (Chapter 136), in any year under consideration;
(h) every day of absence on any grounds approved by the employer;
(i) every day of absence due to any injury to the worker caused by an accident arising out of and in the course of his employment;
(j) every day of absence due to any occupational disease specified in Schedule II of the Workmen's Compensation Ordinance (Chapter 139);
(k) every day on which the employer fails to provide work for the worker and
(l) every day of absence due to a strike or lockout that is not illegal and that does not continue for more than 30 days; but shall not include the day fixed as the weekly holiday under Section 24.

(2) (i) If the number of holidays that a worker is entitled to does not exceed seven, such worker shall be allowed, and he shall take those holidays on consecutive days.
(ii) If the number of h9olidays that a worker is entitled to exceeds seven, such worker shall be allowed, and he shall take seven of those holidays on consecutive days.

(3) Subject to the provisions of Paragraph 2, a worker shall be allowed his holidays on a day or days to be mutually agreed upon between him and his employer.

(9) The remuneration for each holiday shall be the average daily wage of the worker obtained by dividing the total wage (excluding overtime and bonuses) earned by the worker for the days on which he has actually worked in the last 60 days of the qualifying year by the number of such days.

(10) The remuneration due to a worker in respect of his holiday or holidays shall be paid to him before such holiday, but not earlier than seven day before such holiday or holidays.

(C) Holidays Act No : 29 of 1971 - Public Holidays – Section 25

1. (a) Subject to the provisions of this Paragraph and of Paragraph 2, every employer shall allow as holidays with remuneration to all workers employed by him the following public holidays within the meaning of the Holidays Act No: 29 of 1971;

(1) The Tamil Thai Pongal day
(2) National Day (4th February)
(3) The day immediately prior to the Sinhala and Tamil New Year day.
(4) The Sinhala & Tamil New Year Day
(5) May Day (1st May)
(6) The day immediately following the Full Moon Poya Day of the Sinhala month of Wesak.
(7) Milad-un-Nabi (Holy Prophet's Birthday)
(8) Christmas Day

The above list contains only 8 public holidays, which are not bank holidays, whereas the list of public and bank holiday for all purposes contains 26 such holidays. However this list does not include June 30th and December 31st which are special bank holidays.

(b) The provisions of sub-paragraph (a) of this Paragraph shall not apply to a worker in any case where a public holiday referred to in that sub-paragraph occurs during any period when such worker is on strike.

(d) The remuneration payable to a worker for each such holiday as is referred to in the preceding sub-paragraph (a) shall be not less than the minimum rate of wages payable for a normal working day in the month in which such holiday occurs.

2. An employer may employ any worker on any such public holiday as is referred to in the preceding paragraph subject, however, to the following conditions :-

(c) A day on or before the thirty first day of December next succeeding such public holiday shall, be granted to the worker as a holiday with remuneration at not less than the daily minimum rate of wages (ascertained by dividing the monthly rate by 26) payable for a normal working day of the month in which the alternative holiday is granted, or
(d) Such worker shall be remunerated for work done on any such public holiday at not less than double the minimum daily rate of wages (ascertained by dividing the monthly rate by 26) for work done during the number of hours constituting a normal working day and at not less than three time the normal hourly rate (obtained by dividing the monthly rate by 200) for work done during each year (and proportionately for work done for part of such hour) in excess of the number of hours constituting a normal working day."

(D) Employees' Provident Fund (EPF) ACT No : 15

The employer is expected to contribute 12% of the wage/salary to the Employees' Provident Fund. The employee has to contribute 8% and it is the obligation of the employer to collect the contributions and remit the contributions to the Central Bank. Contributions have to be made in respect of all employees, including casuals.

For purposes of contributions total earnings include the basic wage, cost of living or special living allowance, payment in respect of holidays, the cash value of any cooked or uncooked food as assessed by the Commissioner of Labour, meal allowances, commissions paid to employees, incentive/piece rate earnings and fees.

Payments of benefits would have to be made upon the employee reaching 55 years in the case of males and 50 years in the case of females. Payments of benefits may also have to be made where the employee is leaving the country or is retiring on medical grounds, or, in the case of females on marriage.

The remittance of contributions should be made within one month from the end of the wage period. For delays a surcharge is levied which ranges from 5 to 50%. Returns have to be made to the Commissioner of Labour.

(E) Employees' Trust Fund (ETF) Act No : 46 of 1980 as amended

Under the law, an employer is required to contribute 3% of the employee's total earnings to the Employees Trust Fund. There is no contribution from the employee. This contribution should be made to the ETF within 30 days of the wage period ending and there are similar surcharges, which are prescribed.

(F) Payment of gratuity Act No : 12 of 1983 as amended

An employee who has 5 years of uninterrupted and continuous service is entitled to gratuity in terms of the Gratuity Act if the employer has more than 15 employees. The payment is half month's salary or 14 days wages where he has not been on a monthly salary, per year of service.

The Act applies if there are more than 15 employees, which includes casuals and apprentices as well. The gratuity becomes payable on the termination of an employee's service or cessation for any reason. For the purpose of this Act, the terminal salary would include the basic wages of living allowance, special living allowance and piece rates.

An employee would forfeit his gratuity if his services are terminated for fraud or willful damage or causing loss and the loss is quantifiable. However, where a gratuity has been deemed to be forfeited a Labour Tribunal may inquire has been deemed to be forfeited a Labour Tribunal may inquire into the matter and order payment. A surcharge is payable for delay beyond one month.

(G) Termination of Employment of Workmen (Special Provisions) Act no:45 of 1971

Order under Section 6D

The newly introduced Formula for Payment of compensation under the Termination of Employment of Workmen Act has come into operation with effect from 15th March 2005.

The new Formula is reproduced in Schedule II and a ready reckoner indicating the quantum of payment applicable for the number of years of service rendered by an employee is given in Schedule III.

(H) BOI Manual on Labour Standards & Employment Relations

1. Employment

1.1 Classification of Workers

1.1.1 Trainees

Those undergoing training for a period of not less than 6 months. 156 working days are classified as trainees.

1.1.2 Un-skilled

Work which does not involve any training is classified as un-skilled work.

1.1.3 Semi-Skilled

On successful completion of a training period of 6 months, a worker is classified as semiskilled.

1.1.4 Skilled

A worker with the requisite skills for the job is classified as skilled worker.

1.2 Recruitment and Retirement

Minimum age for recruitment shall be 18 years. The normal age of retirement is 55 years. However, extension beyond 55 years can be granted at the discretion of the management.

Persons who have attained the age of 16 years but below the age of 18 years can be employed, subject to the following conditions :-

a) Persons under 18 years cannot be employed for more than 50 hours of overtime during any month.
b) Persons under the age of 18 years cannot be employed after 10.00 p.m. and before 6.00 a.m.

1.3 Prohibition of Forced or Compulsory Labour

No employer in any BOI enterprise shall use any form of forced or compulsory labour.

1.4 Prohibition of Child Labour

No employer in any BOI enterprise shall use child labour either directly or indirectly through sub-contractors.

1.5 Equal Status

Male and female workers shall be accorded equal opportunity in employment and occupation and paid equal remuneration for work of equal value.

1.6 Contract of Employment

A written contract of employment embodying terms and conditions of service including the designation or category of the employee, normal hours of work, rate of pay, period of training if any, probationary period, leave, holidays and superannuation benefits, has to be issued to every worker including trainees and acknowledgement of receipt obtained by the employer.

1.7 Certificates of Employees

1.7.1. Original Certificates of employees are meant only for purposes of scrutiny of their authenticity. No employer should keep any original certificate of an employee in his custody beyond the completion of three months from the date of commencement of employment of the employee.

1.7.2. On termination of employment/resignation, employee's certificates, if any, in the custody of the employer should be returned to the employee at least within 30 days from the date of termination of employment/resignation.

2. Hours of work

2.1 Normal Working Day

2.1.1 One–Shift Operation

Monday to Friday

9 hours per day inclusive of an interval of one hour for a meal or rest.

Saturday

A short working day of 6, 6 ½ or 7 hours inclusive of an interval of one hour for a meal or rest, as the case may be, as determined by the Wages Board for the respective trade (e.g. 6 hours in the case of Textile Manufacturing, Security Service, Tyre and Tube Manufacturing, Tyre rebuilding, Rubber & Plastic Goods Manufacturing Trades, 6 ½ in the case of Garments Manufacturing and Hosiery Manufacturing and Engineering Trades and 7 hours in the case of Rubber Export and Tea Export Trades).

2.1.2 Two/Three-Shift Operation

Monday to Friday

8 hours per day inclusive of an interval of half an hour for a meal or rest.

Saturday

A short working day of 5 ½ hours inclusive of an interval of half an hour for a meal or rest.

2.1.3 For office employees, any day in the week can be granted as a half a day of 5 hours duration.

2.2 Night Work

2.2.1 There are no restrictions on employment of male workers on night shift.

2.2.2 Employment of female workers on night work from 10.00 p.m. to 6.00 a.m. on the following day will be allowed as a third shift, subject to the following conditions :-

(a) Written consent of the worker to be available.

(b) The employer to obtain prior approval from the Department of Labour for night work. The Industrial Relations Department of the BOI will provide assistance upon request.

(c) Payment of 1 ½ times the daily rate of wages for the normal night shift.

(d) Maximum of 10 days night work per female worker in any one month.

(e) A worker employed between 6.00 a.m. and 6.00 p.m. not to be employed on night shift on same day.

(f) A worker employed on night work to be allowed an adequate period for rest after such work.

(g) Matron/female supervisors to be present during the shift.

(h) Refreshments, medical and rest room facilities to be made available.

(i) Transport facilities to be made available for use in an emergency.

(j) Persons under the age of 18 years cannot be employed on night work.

3. Wages and Overtime Payment

3.1 Wage Rates

Employees of BOI enterprises will be paid wages in accordance with such rates as may be notified by the BOI from time to time.

3.2 Payment of Wages

3.2.1 All employees to be paid a monthly wage. No wages to be paid on daily rate or piece rate or on contract basis.

3.2.2 All employees shall be paid their wages within ten (10) days of the expiry of the wage period.

3.2.3 Only authorized deductions such as cash advances, loans obtained by the employees, etc with the consent of the employees, income tax, employees contribution to EPF and any other deductions approved by the commissioner of Labour can be made from wages. The aggregate of such deductions should not exceed.

a) 50% of the wages due for the period in the case of employees covered by decisions of Wages Boards for all trades other than Tea, Rubber, Cocoa and Coconut growing trades, and

b) 60% of the wages due for the period in the case of office employees

Aggregate deductions do not include deductions authorized to be made from employees' wages by any written law such as Inland Revenue Act, EPF Act, etc.

3.2.4 For the purpose of calculating no-pay deductions, holiday payments etc. the daily salary shall be arrived at by dividing the monthly salary by 30 days in the case of office employees and the monthly wages by 25, 26 or 30 according to the relevant Wages Board decisions in the case of factory employees eg. 25 in the case of Motor Transport Trade, Hosiery manufacturing Trade and Textile Manufacturing Trade and 30 in the case of Printing Trade, Tyre, Tube Manufacturing, Tyre Rebuilding, Rubber and Plastic Goods Manufacturing Trade.

3.2.5 Proper wages records indicating basic wage, allowances, overtime Sunday/Public Holiday earnings and deductions shall be maintained and kept in the Enterprise, as required by the relevant law.

3.2.6 Employees should be paid wages for the days on which the employer is unable to provide work.

3.2.7 On termination of services, an employee's salary shall be paid within two working days of such termination.

3.3 Payment of Overtime

3.3.1 Any work performed in excess of the normal working day (see 2.1) to be treated as overtime work and shall be remunerated accordingly.

3.3.2 Every hour of such work should be paid at 1 ½ times the normal hourly rate of wages, which is determined by dividing the monthly rate of wages by 200 in the case of factory employees and 240 in the case of office employees.

3.3.3 In calculating hours of overtime employment, any fraction of an hour less than half an hour shall be treated as half an hour, unless otherwise determined by the relevant Wages Board for any trade.

For example, under the decisions of the Wages Boards for the garments manufacturing trade, hosiery manufacturing trade and textile manufacturing trade overtime rate for any fraction of an hour will be determined proportionately.

3.3.4 No factory employee who is –

(a) a female shall be employed on overtime work in excess of 60 hours a month, and

(b) under the age of 18 years shall be employed on overtime work in excess of 50 hours a month.

4. Holidays

4.1 Weekly Holiday

4.1.1 Sunday shall be the weekly holiday for factory workers. It is an unpaid holiday. If a worker is employed on a Sunday on account of urgent work, he shall be paid at not less than 1 ½ times the daily rate of wages.

$$\left(\frac{\text{monthly salary}}{26} \times 1\tfrac{1}{2}\right)$$

In addition, a day off shall be given within the 6 days succeeding such Sunday. Any work performed on a Sunday in excess of the normal working day (see 2.1) to be remunerated at double the hourly rate of wages.

$$\left(\frac{\text{monthly salary}}{200} \times 2\right)$$

4.1.2 Office employees to be granted one whole day and one half day paid holiday per week on any day in the week. If a statutory holiday falls on such day an alternative half holiday or whole holiday to be granted either in the same week or in the week immediately succeeding.

4.2 Poya Holiday

The full moon Poya Day of each month is a holiday with pay for monthly paid employees. If an employee is required to work on such day he shall be paid an extra half day's wage in addition to the monthly wage. When a poya day falls on a weekly holiday or public holiday, no additional holiday need be given to employees in lieu of the poya day.

4.3 Public Holiday

Public holidays declared by the government for the mercantile sector and those prescribed by the relevant wages board, shall be allowed as holidays with full remuneration. There are 8 such holidays at present, namely:-

1. The Tamil Thai Pongal Day
2. National Day
3. The Day prior to the Sinhala & Tamil New Year Day
4. The Sinhala and Tamil New Year Day
5. May Day
6. The Day following the Wesak Full Moon Poya Day
7. Milad-Un-Nabi (Holy Prophet's Birthday)
8. Christmas Day

4.4 Employment of workers on public holidays

If a worker is employed on a Public Holiday he shall be paid in respect of that day wages not less than double the daily rate of wages or be granted an extra holiday in lieu thereof with pay.

5. Leave

5.1 Vacation Leave/Annual Holidays

5.1.1 An office employee shall be granted 14 days vacation leave with pay in respect of the second and any subsequent year if he has been continuously in employment during the year. (i.e. 1st January – 31st December)

5.1.2 In respect of the first year of employment leave to granted on a pro-rata basis depending on the date of commencing employment – i.e. commencing within the first quarter – 14 days, second quarter – 10 days, third quarter – 07 days

and last quarter – 04 days. Qualifying period shall be reckoned from the date of recruitment.

5.1.3 A factory employee shall be granted annual holidays with pay, up to a maximum of 14 to 21 days, in accordance with the formula determined by the Wages Board for the relevant trade. For example, the number of days annual holidays applicable to employees in the garments and hosiery manufacturing trades shall be determined by applying the following formula:

$$\frac{218 - 274 \text{ days}}{4} = 14 \text{ days}$$

Maximum number of annual holidays vary according to the formula adopted by the particular Wages Board.

5.1.4 Vacation leave – Annual holidays earned during a particular year has to be taken in the succeeding year on days mutually agreed upon by employer and employee.

5.1.5 On termination of employment, payment to be made for any leave standing to the credit of an employee.

5.2 Casual Leave

An office employee has to be granted 7 days casual leave with pay from the second year of employment and on the basis of one day per every two month's service during the first year of employment.

5.3 Sick Leave

Sick leave may be granted at the discretion of the management. Medical certificates to be produced by the employee to cover such leave.

5.4 Maternity Leave

5.4.1 A female factory employee shall be allowed 12 weeks (84) days leave with pay if the confinement results in the issue of a live child and the employee has no child or has one child at the date of such confinement.

5.4.2 In case she has two or more children or where confinement does not result in the issue of a live child, she shall be allowed 6 weeks (42) days) leave with pay.

5.4.3 An employee is entitled to utilize leave upto a maximum of 14 days prior to confinement and the balance of leave after confinement.

5.4.4 A female office employee shall be granted maternity leave with pay for 84 working days on the above basis. However, such leave shall be in addition to other paid leave/holidays she is entitled to.

5.4.5 Payment for period of leave to be made on the basis of monthly salary on the normal pay day.

5.4.6 A factory employee who is nursing a child under one year of age is entitled to in any period of nine hours two nursing intervals at such times as she may require. Each nursing interval so provided shall be – (a) not less than thirty minutes where a crèche or other suitable place for nursing of the children is provided by the employer for the nursing of children (b) not less than 01 hour where a crèche or other suitable place is not provided by the employer for the nursing of children. The nursing interval shall be in addition to the intervals provided for meals/rest.

5.4.7 Office employees are not entitled to nursing intervals, but employers are encouraged to consider granting the same facility as in the case of factory employees.

(5.A) For the purposes of sections (2), (3), (4) and (5) of the Manual, an employee who is enagaged in any trade for which no Wages Board has been established shall deemed to be an employee governed by the decisions of the Wages Board for the Garment Manufacturing Trade.

SCHEDULE B

National Environmental Act (Amendment) No 56 of 1988

1. Tolerant Limits for effluents

Tolerance Limits for Effluents From Textile Industry Discharged Into Inland Surface Waters

No.	Determinant	Tolerance Limit
1	pH value at ambient temperature	6.5 to 8.5
2	Temperature, ^{0}C, max	40 measured at site of sampling
3	Total suspended solids, mg/l, max	50
4	Biochemical Oxygen Demand (BODS) in 5 days at 20^0 c mg/l, max	60
5	Chemical Oxygen Demand (COD) mg/l, max	250
6	Oils and grease, mg/l, max	10.0
7	Phenolic Compounds (as phenolic OH), mg/l, max	1.0
8	Sulfides, mg/l, max	2.0
9	Chromium total, mg/l, max	2.0
10	Hexavalent chromium, mg/l, max	0.5
11	Copper, total, mg/l, max	3.0
12	Zinc total, mg/l, max	5.0
13	Ammoniacal nitrogen, mg/l, max	60
14	Chloride (as CI) mg/l, max	70

Note 1 : All efforts should be made to remove colour and unpleasant odour as far as practicable.

Note II : These values are based on dilution of effluents by at least 8 volumes of clean receiving water. If the dilution is below 8 times, the permissible limits are multiplied by 1/9 of the actual dilution.

2. Permissible Notice Levels

(Regulation 2)

(a) Maximum Permissible Noise Levels at Boundaries in Laeq'T

Area	LAeq'T	
	Day Time	Night Time
Low Noise	55	45
Medium Noise	63*	50
High Noise	70	60
Silent Zone	50	45

* Provided that the noise level should not exceed 60 dB(A) inside existing houses, during day time.

(Regulation 3)

(b) The following noise levels will be allowed where the background noise level exceed or is marginal to the given levels (a) above.

a)	For low noise areas in which the background noise level exceeds or is marginal to the given levels	Measured Background Noise level + 3 dB(A)
b)	For medium noise areas in which the background noise level exceeds or is marginal to the given levels	Measured Background Noise level + 3 dB(A)
c)	For silent zone in which the background noise level exceeds or is marginal to the given levels	Measured Background Noise level + 3 dB(A)
d)	For high noise areas in which the background noise level exceeds or is marginal to the given levels For day time For night time	 Measured Background Noise level + 5 dB(A) Measured Background Noise level + 3 dB(A)

The above maximum noise levels should be maintained inside the boundary of the land, in which the source noise is located.

(Regulation 4)

(c) Maximum permissible Noise Levels at Boundaries of the land in which the source of noise is located in LAeq'T, for construction activities.

LAeq',T	
Day time	**Night time**
75	50

(Regulation 7 (a))

(d) Maximum permissible Noise levels at Boundaries in Laeq',T for industrial activities.

Areas	**LAeq'T**	
	Day Time	**Night Time**
Rural Residential Area	55	45
Urban Residential Area	60	50
Noise Sensitive Area	50	45
Mixed Residential	63	55
Commercial Areas	65	55
Industrial Area	70	60

(Regulation 7 (b))

(e) The following noise levels will be allowed in places where the background noise levels exceed or is marginal to the given levels in (a) above

a)	For rural residential areas in which the background noise level exceeds or is marginal to the given level	Measured Background Noise level + 3 dB(A)
b)	For noise sensitive areas in which the background noise level exceeds or is marginal to the given level	Measured Background Noise level + 3 dB(A)
c)	For noise sensitive areas in which the background	Measured Background Noise

noise level exceeds or is marginal to the given level	level + 3 dB(A)
d) For mixed residential areas or commercial areas in which the background noise level exceeds or is marginal to the given level	
For day time	Measured Background Noise level + 5 dB(A)
For night time	Measured Background Noise level + 3 dB(A)
e) For industrial areas in which the background noise level exceeds or is marginal to the given level	
For day time	Measured Background Noise level + 5 dB(A)
For night time	Measured Background Noise level + 3 dB(A)

3. Interim Standards for Vibration Control

(a) Table 2.1 : Interim standards for vibration of the Operation of Machinery, Construction Activities and Vehicle Movements Traffic

Category of the structure as given in Table 1.1	Type of Vibration	Frequency of Vibration (Hz)	Vibration in PPV (mm/Sec)
Type 1	Continuous	0-10	5.0
		10-50	7.5
		Over 50	15.0
	Intermittent	0-10	10.0
		10-50	15.0
		Over 50	30.0
Type 2	Continuous	0-10	2.0
		10-50	4.0
		Over 50	8.0
	Intermittent	0-10	4.0
		10-50	8.0
		Over 50	16.0
Type 3	Continuous	0-10	1.0
		10-50	2.0
		Over 50	4.0
	Intermittent	0-10	2.0
		10-50	4.0
		Over 50	8.0
Type 4	Continuous	0-10	0.25
		10-50	0.5
		Over 50	1.0
	Intermittent	0-10	0.5
		10-50	1.0
		Over 50	2.0

Notes

1. Please see separate measurement methods

2. The values given above are in such a way that minor damage is unlikely as the nearby house/building

(b) Table 2.2 : Interim Standards on Vibration for Blasting Activities

Category of the structure as given in Table 1.1	Type of Vibration	Type of Blasting	Ground Vibration I PPV (mm/sec.)	Air blast over Pressure (dB (L))
Type 1	Impulsive	Single bore hole	8.0	105
		Multi bore hold with delay detonators	10.0	115
Type 2	Impulsive	Single bore hole	6.0	105
		Multi bore hold with delay detonators	7.0	115
Type 3	Impulsive	Single bore hole	4.0	105
		Multi bore hold with delay detonators	5.0	115
Type 4	Impulsive	Single bore hole	0.5	95
		Multi bore hold with delay detonators	0.75	100

Notes

1. Please see separate measurement methods
2. The values given above are in such a way that minor damage is unlikely as the nearby house/building

4. Standards for the inconvenience of the occupants in buildings

The frequency response of vibration of the human body is complex as explained in chapter 6. However, approximate response curves (basic curve) for Z axis are given in BS 6472 : 1992. These are given in terms of base curves, which may be close to the threshold of perception for majority of people

(a) Table 3.1 : Base curve in relation to preparing of interim vibration for the inconvenience of the occupants in building taken from BS 6472 : 1992

Frequency Hz	PPV (mm/sec)
1.00	2.250
1.25	1.610
1.60	1.110
2.00	0.296
2.50	0.569
3.15	0.402
4.00	0.281
5.00	0.225
6.30	0.179
8.00	
10.00	
12.50	
16.00	

20.00	
25.00	
31.00	
40.00	
50.00	
63.00	

(b) Table 3.2 : Multiplying factors use to specify magnitudes of building vibration with respect to human resource using the base curve in Table 3.1

Place	**Time**	**Multiplying Factors**		
		Continuous vibration (day time and night time)*	Impulsive vibration (max. of three occurrences per day)	Intermittent vibration
Critical working areas (e.g. hospital operating theatres, precision laboratories	Day Night	1 1	1 1	1 1
Residential	Day Night	6 2	40 10	20 5
Office	Day Night	6 6	80 80	30 30
Workshop	Day Night	8 8	100 100	50 50

Note : * “day time” from 0600h to 1800h
“night time” from 1800h to 0600h

Environmental and Social Risks

Environmental Risks	Social Risks
a) Land Use	**a) Land Use**
1. Modest clearing of land for the setting up of factory and premises.	1. Though large scale clearing of land is not envisaged families may have to be relocated. Purchase of land may not be remunerated in the most justifiable manner.
2. Re-claiming of land such as marches for factory premises. Subsequent filling up may upset the ecological balance of environment.	
b) Manufacturing Process	**b) Manufacturing Process**
1. The excessive noise in the factories especially use of generators and boilers	1. Risk from exposure to chemicals and chemical handling (Adequate education regarding handling of such materials are not available and safety precautions regarding same are often neglected)
2. Discharge of untreated process wastewater the residue of the dyeing process to the environmental / inland surface water systems.	2. Non availability of necessary first aid and medical care
	3. Risk/injuries from use of machinery in the factory on a continuous basis over long periods
	4. Noise related injuries (being in an environment where several machines are being operated over an extensive period of time
	5. Inadequate ventilation. High temperature levels and resultant humidity. Difficult work conditions.
	6. Unsafe elevated platforms, walkways and stairways, conveyer belts etc
	7. Ungrounded, poorly insulated electrical equipment
	8. Lack of training on work place accidents
	d) General Health and Safety
	1. Lack of hygienic and adequate sanitary facilities at work place
	2. Inadequate medical facilities and regular medical examinations.
	3. Lack of sufficient canteen and recreational space for those involved in long shifts
	4. Inadequate monitoring of overtime
	5. Poor level of personal hygiene
	e) Others
	5. Non payment of statutory contributions to EPF and ETF by the employer

SECTOR STUDIES

TELECOMMUNICATION SECTOR

1. Introduction to the Industry

The main participants in the Sri Lanka's Communication sector consists of nine (9) Public Switched Telephony Network (PSTN) operators, with 4 operators licensed to provide fixed telephony services and the balance 5 operators licensed to provide mobile telephony services. Telecommunication Regulatory Commission of Sri Lanka acts as the regulator empowered to regulate activities of the communication industry in Sri Lanka.

Fixed Telephony Services
The fixed telecommunication sector consists of three established operators namely the incumbent operator Sri Lanka Telecom Limited (SLT) and the three Wireless Local Loop (WLL) operators. The three WLL operators are Suntel PLC and Lanka Bell (Pvt.) Limited and Dialog Broadband Networks (Pvt.) Limited.

Mobile Telephony Services
The mobile telecommunication sector consists of four established cellular mobile operators, namely Dialog Telekom PLC, Tigo (Pvt.) Limited, Mobitel (Pvt.) Limited and Hutchison Telecommunications Lanka (Pvt.) Limited. In view of further liberalising the mobile telecommunication sector TRCSL issued a fifth mobile operator license to Bharati Airtel of India, which is expected to commence their services in the near future.

The Regulatory Framework
The telecommunication industry is governed by the Sri Lanka Telecommunications Act No.25 of 1991 as amended by the Sri Lanka Telecommunications (amendment) Act Number 27 of 1996 (the Act). The Act provides for the conversion of the previous regulatory body, the telecommunications authority, into the Telecommunications Regulatory Commission of Sri Lanka (TRCSL). The Consolidated Act gives the TRCSL the authority to make rules, which govern areas including interconnection and quality of service.

The following guidelines are applicable to cellular, microwave, and other radio-based systems, satellite receivers, and wire line installations, including receiving and transmitting stations, switches, and related equipment.

2. Environmentally Sensitive Areas

2.1 Right of Way Alignment

The principal elements of NDB policy regarding right of way alignment, land acquisition, tower erection and creation of access (e.g. roads) in otherwise inaccessible environmentally sensitive areas are summarized below. The sponsors should ensure that they adhere to NDB's policy as per the following guidelines.

a) All new rights of way should be aligned taking environmental factors into consideration, in a manner which will minimize to the extent possible, the need for physical alteration and the impact on sensitive natural environments, cultural resources, agricultural lands, and residential and commercial areas;

b) Land acquisition must be carried out such that impacts on land based livelihood, and compensation to land owners and people relying on the land for their livelihood are minimal;

c) Where rights of way are to be established through remote and currently inaccessible environmentally sensitive areas, the potential impacts on the natural environment, indigenous populations, population immigration and natural resource exploitation must be assessed and measures adopted to minimize these impacts;

d) Environmental impacts of proposed projects should be minimized through such measures as visual impact considerations in siting and design, restricting right of way use by non-authorized persons, erosion and sediment control during and after construction, and use of low impact maintenance procedures.

2.2 Ambient Noise

Noise abatement measures should achieve either the following levels or a maximum increase in background levels of 5 dB(A). Measurements are to be taken at noise receptors located outside the project property boundary.

Receptors	Maximum Allowable (hourly) in dB(A)	
	Daytime	Night time
Residential Institutional Educational	55	45
Industrial Commercial	70	70

2.3 Solid and Liquid Wastes

a) Project sponsors should recycle or reclaim materials where possible.

b) If re-cycling or reclaim is not practical, wastes must be disposed of in an environmentally acceptable manner and in compliance with local laws and regulations.

c) All hazardous materials, process residues, solvents, oils, and sludge from raw water, process waste water and domestic sewage treatment systems must be disposed of in a manner to prevent the contamination of soil, groundwater and surface waters.

3. Other General Environmental Requirements

a) Transformers or equipment containing Polychlorinated Biphenyls (PCBs) or PCB contaminated oil should not be installed and existing equipment involving PCBs or PCB contaminated oil should be phased out and disposed of in a manner consistent with applicable regulations;

b) Processes, equipment and central cooling systems involving the use or potential release to the environment of Chlorofluoro Carbons (CFCs), should not be installed, and their use in existing processes and systems should be phased out and disposed of in a manner consistent with the set guidelines for such disposal;

4. Safety Requirements

4.1 Work place Noise

a) Feasible administrative and engineering controls, including sound-insulated equipment and control rooms should be employed to reduce the average noise level in normal work areas;

b) Plant equipment should be well maintained to minimize noise levels;

c) Personnel must use hearing protection when exposed to noise levels above 85dBA.

4.2 Other Physical Agents

a) The design and maintenance of equipment must ensure safe exposure levels for physical factors that may cause adverse health effects (e.g. ionizing and non-ionizing radiation, magnetic fields).

4.3 Electrocution

a) Strict procedures for de-energizing and checking of electrical equipment must be in place before any maintenance work is conducted;

b) In cases where maintenance work has to be performed on energized equipment, a strict safety procedure must be in place and work must be performed under constant supervision;

c) Personnel training must be conducted in revival techniques for electrocution.

4.4 Hazardous Material Handling and Storage

a) All hazardous (reactive, flammable, radioactive, corrosive and toxic) materials must be stored in clearly labeled containers or vessels.

b) Storage and handling of hazardous materials must be in accordance with the relevant regulations, and appropriate to their hazard characteristics;

c) Fire prevention systems and secondary containment should be provided for storage facilities, where necessary or required by regulation, to prevent fires or the release of hazardous materials to the environment.

5. Record keeping and Reporting

a) The sponsor should maintain records of significant environmental matters, including monitoring data, accidents and occupational illnesses, and spills, fires and other emergencies.

b) This information should be reviewed and evaluated to improve the effectiveness of the environmental, health and safety program.

c) An annual summary of the above information should be provided to NDB.

ANNEX IV

RISK CATEGORIES

A. Category A projects

a) Environmental risk

Projects that have significant adverse environmental impacts that are irreversible (for example leading to loss of a major natural habitat), diverse or unprecedented. These projects may affect an area broader than the sites of facilities subject to physical works.
Examples:

- Large dams and reservoirs
- Large scale forestry
- Large scale agro-industry
- Large scale industrial plants
- Major new industrial estates
- Major oil and gas developments, including major pipelines
- Large ferrous and non-ferrous metal operations
- Large port and harbour developments
- Large thermal and hydropower development

Projects of which the production process involves

- Manufacturing, transport, use or disposal of environmentally significant quantities of pest control products
- Manufacturing, transport or use of hazardous and/or toxic materials
- Domestic and hazardous waste disposal operations

b) Social risk

- Projects or business activities in the primary sector, such as agriculture or extractive industries, which typically involve large amounts of unskilled or temporary/migrant labour;
- Labour-intensive industries, especially those situated in export processing zones or sectors with notorious social problems (discrimination of certain ethnicities, child labour, forced labour, trade union violations);
- Industries with hazardous working conditions (physically demanding or risky work, handling of toxins, chemicals etc.);
- Projects that involve large-scale retrenchment;
- Projects that may have adverse effects on the immediate environment, such as the need to dispossess and resettle people, intensified exposure of indigenous communities to mainstream society or erosion of the natural resource base of local communities;
- Projects in which privatisation may have possible adverse effects on access to basic social services (water, shelter, education, health care) or to other services with a high development impact (energy, telecommunication), because of increases in prices.

c) Assessment

The environmental and/or social assessment of Category A projects typically examines the project's potential positive and negative impacts, compares them with those of feasible alternatives (including the 'without project' scenario) and recommends any measures needed to prevent, minimize, mitigate or compensate for adverse impacts and improve performance. A full environmental and/or social assessment is required which is normally an Environmental and/or Social Impact Assessment.

B. Category B projects

The environmental and social impacts of Category B projects are site-specific and mitigation measures are more or less standard and known for that industry sector. Many projects fall within this category. They range from almost a Category A project to the Category C projects where you would have no environmental or social assessment. To give more insight on the nature of the assessment for a Category B project, it could be subdivided the category into B1 (high risk), B2 (medium) and B3 (low, often health & safety issues). It would be possible to assess whether adequate level of measures have been taken to deal with the E & S risks by looking at the answers provided for the sector checklist. If the risks are adequately addressed, the bank could proceed with financing the project with standard Environmental and Social clauses. If not, a more thorough assessment will need to take place with the assistance of the environmental and social coordinator or an external consultant.

Examples of the different sub-categories:

a) Environmental risk

Category B1	**Category B2**	**Category B3**
Small scale agro-industry	Small scale rehabilitation, maintenance and modernization projects	Cinema (health & safety e.g. fire prevention)
Electrical transmission (high voltage lines in urban and rural areas, mobile systems in natural habitats and culturally important sites)	Renewable energy (stand alone wind/solar projects, run-of-river hydro power)	Retail (health & safety e.g. fire prevention, waste management)
Aquaculture	Rehabilitation of existing hotel facilities	Office buildings
Renewable energy (large wind-energy parks)	General manufacturing Textile plants without dying line	
Tourism in newly developed areas (this can be Category A in case of natural parks location)	Telecommunications (mobile systems and low voltage lines in urban areas)	
Rural water supply and sanitation		
Manufacturing of construction materials		
Textile plants with dying line		
Greenfield projects in existing industrial estates		

b) Social risk

Category B1	**Category B2**	**Category B3**
Rural water supply and sanitation	Companies with more than 200 employees	Companies with more than 50 employees
Textile plants with risk of child labour inside plant or with suppliers		
Companies with history of tensions with local groups or employees		
Companies with more than 500 employees		

c) Assessment

A wide range of environmental and social guidelines have been developed by local or country authorities, as well as by a number of (international) organisations like the Worldbank Group or the International Labour Organisation (ILO, see http://www.ilo.org/ilolex/english/convdisp1.htm). In addition site-specific environmental and social clauses could be developed for individual projects. Depending on the environmental or social issues encountered in the first check, the assessment will be focussed on those.

C. Category C projects

a) Environmental risk

Category C projects have minimal or no adverse environmental impacts.

Examples:

- Advisory companies
- Small financial services companies
- Technical assistance
- Small shops

b) Social risk

- Category C projects typically employ a small and highly educated workforce with good to excellent labour conditions, for example software or leasing companies.

c) Assessment

Beyond screening, these projects require no further environmental or social assessment.

ANNEX V

Proposed terms & conditions to be added in legal documents

Standard contract clauses for B and C projects

ENVIRONMENTAL, SOCIAL, HEALTH & SAFETY COMPLIANCE

[1] The BORROWER undertakes to ensure that it diligently designs, constructs, operates, maintains and monitors all of its plants, sites and equipment in a safe, efficient and business-like manner and shall at all times comply with relevant local laws

[2] The BORROWER shall not perform any activities of the exclusion list

[3] The BORROWER shall notify promptly of serious events concerning the environment or occupational health and safety or social issues

Standard contract for A projects

ENVIRONMENTAL, SOCIAL, HEALTH & SAFETY COMPLIANCE

1. The BORROWER undertakes to ensure that it diligently designs, constructs, operates, maintains and monitors all of its plants, sites and equipment in a safe, efficient and business-like manner and shall comply with

   a) all Sri Lankan environmental, labour and other social laws (including international treaty obligations) applicable in any jurisdiction in which the Borrower conducts business and

   b) any environmental and social permit, license, consent, approval and other authorisations necessary for the Borrower to conduct its business and to ensure that all such authorisations and approvals are valid, and

   c) the IFC Performance Standards and the terms and standards as set out in any ILO convention signed and ratified by the Country.

2. The BORROWER shall not perform any activities of the exclusion list.

3. The BORROWER undertakes to submit annually and not later than 90 days after the end of each Financial Year an **Annual Environmental and Social Monitoring Report**

[4] The BORROWER shall comply with the **Environmental and/or Social Action Plan** *if applicable*

[5] *Other clauses, depending on Environmental and Social Due Diligence results if applicable*

ANNEX VI

IFC Performance Standards

No	Performance Standard
1	Assessment and Management of Environmental and Social Risks and Impacts
2	Labour and Working Conditions
3	Resource Efficiency and Pollution Prevention
4	Community Health, Safety, and Security
5	Land Acquisition and Involuntary Resettlement
6	Biodiversity Conservation and Sustainable Management of Living Natural Resources
7	Indigenous Peoples
8	Cultural Heritage

ANNEX VII

PROJECT STATUS REPORT ON ENVIRONMENTAL AND SOCIAL RISKS

Name of the Company : ……..

Address : Head Office ……..
……..
Project Site ……..
……..

Facility Amount	Rs…….	Last visits date	
Amount Disbursed	Rs……	Original Risk Category	
Amount to be disbursed	Rs ……	Revised Risk category	
Date of Commitment	Rs ……		

	Risk Identified	**Proposed Remedy**	**Date for Compliance**	**Status (Complied/ Not complied / partly fulfilled)**	**Visit Related Remarks**
(1)					
(2)					
(3)					
(4)					
(5)					
(6)					
(7)					
(8)					
(9)					

…….. …….. ……
Relationship Manager Unit Head E & S Champion- Technical
Name :……. Name :…...:……. Name :…….
Date : …… Date : …… Date :……..

ANNEX VIII
REPORT ON NON COMPLIANCE WITH
ENVIRONMENTAL AND SOCIAL TERMS AND CONDITIONS ON PROJECTS

For the Quarter Ended ……

Date : …….

To : Environmental and Social Manager

Throu' : Environmental & Social Champion- Project Finance

Environmental & Social Champion – Emerging Corporates

From : Environmental & Social Coordinator

	Name of the company	**Description of the Project**	**Terms / conditions non complied with**	**Reason / Comments**