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INDUSTRIAL DEVELOPMENT ORGANIZATION

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# ENVIRONMENT, SOCIAL & SAFETY MANUAL FOR INTEGRATED AGRO-INDUSTRIAL PARKS (IAIP/RTC)

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# SOLID WASTE MANAGEMENT MANUAL



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## LIST OF ABBREVIATION AND ACRONYMS

<b>BSc</b>	Bachelor of Science
<b>EHS</b>	Environment Health and Safety
<b>IAIP</b>	Integrated Agro Industry Park
<b>IFC</b>	International Financial Cooperation
<b>KPI</b>	Key Performance Indicator
<b>RTCs</b>	Rural Transformation Centers
<b>SME</b>	Small and Micro Enterprise

## DEFINITIONS

**Electronic waste (E-Waste)** - a waste type consisting of any broken or unwanted electrical or electronic appliance. It is a point of concern, considering that many components of such equipment are considered toxic and are not biodegradable

**Hazardous waste** - is waste that poses substantial or potential threats to public health or the environment. These wastes may be found in different physical states such as gaseous, liquids, or solids. Furthermore, a hazardous waste is a special type of waste because it cannot be disposed of by common means like other by-products of our everyday lives.

**Household solid wastes** – these are wastes that are mostly generated at home. Typically, this includes food, packaging (bottles and cans), newspaper and other papers, and miscellaneous items that have been used up or broken and are thrown out as waste (e.g., ashes, fruit garbage, old shoes, worn out clothes, broken cooking pot, used paper, baskets, bag, etc.).

**Integrated solid waste management**– the management of solid waste based on a consideration of source reduction, recycling, waste transformation and disposal arranged in a hierarchical order. It is purposeful and systematic control of the functional elements of generation; waste handling, separation and processing at the source. It includes collection, separation, processing and transformation of solid waste. It also includes transfer, transport and disposal associated with the management of solid wastes from the point of generation to final disposal

**Industrial wastes** – are generally discarded from industrial operation or derived from manufacturing process.

**Institutional wastes** – are generated by schools, hospitals and government administrative buildings among others.

**Landfills**- are the physical facilities used for the disposal of residual solid wastes in the surface soils of the earth. In the past, the term sanitary landfill was used to denote a landfill in which the waste placed in the landfill was covered at the end of each day's operation.

**Municipal solid waste**- refers to solid wastes from houses, streets and public places, shops and offices which are very often the responsibility of municipal or other governmental authorities.

**Resource recovery** - means the obtaining of some economic benefit from material that someone has regarded as waste. It is a general term used to describe the extraction of economically usable materials or energy from waste. The concept may involve recycling or converting into different and sometimes unrelated uses.

**Solid waste**- includes any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility, and other discarded material including solid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, and agriculture operations and from community activities.

**Solid waste management**- may be defined as the discipline associated with the control of generation, storage, collection, transfer and transport, processing and disposal of solid wastes in a manner that is in accord with the best principles of public health, economics, engineering, conservation, aesthetics, and other environmental considerations, and that is also responsive to public attitudes.

# 1. INTRODUCTION

## 1.1. Purpose and scope of the Manual

The scope of the manual is intended to be served for the IAIP/RTCs. This Solid Waste Management Manual (hereafter referred to as the Manual) is intended to serve as a day-to-day planning and implementation guidelines for IAIP/RTCs.

## 1.2. Updating frequency and Procedure

This manual is prepared in a user friendly manner in such a way that it could be used by various professionals and practitioners in view of the specific circumstances and situations in such a way that local variations should be accommodated in a flexible way.

## 2. STANDARDS, NORMS AND REGULATIONS

Applicable legal frameworks are:

- Solid Waste Management Proclamation 513/2007
- Hazardous Waste Management Proclamation 1090/2018
- Industrial Chemical Disposal and Management
- E-Waste Management Proclamation 425/2018
- Clinical Waste Management Guidelines etc. and
- IFC 2007 Waste Management Guidelines

Hence, IAIP/RTC needs to implement relevant standards and norms which can support its purpose. Internal Code of Conduct which has all the detailed roles and responsibilities must be annexed with agreement.

## 3. MANAGEMENT MODEL

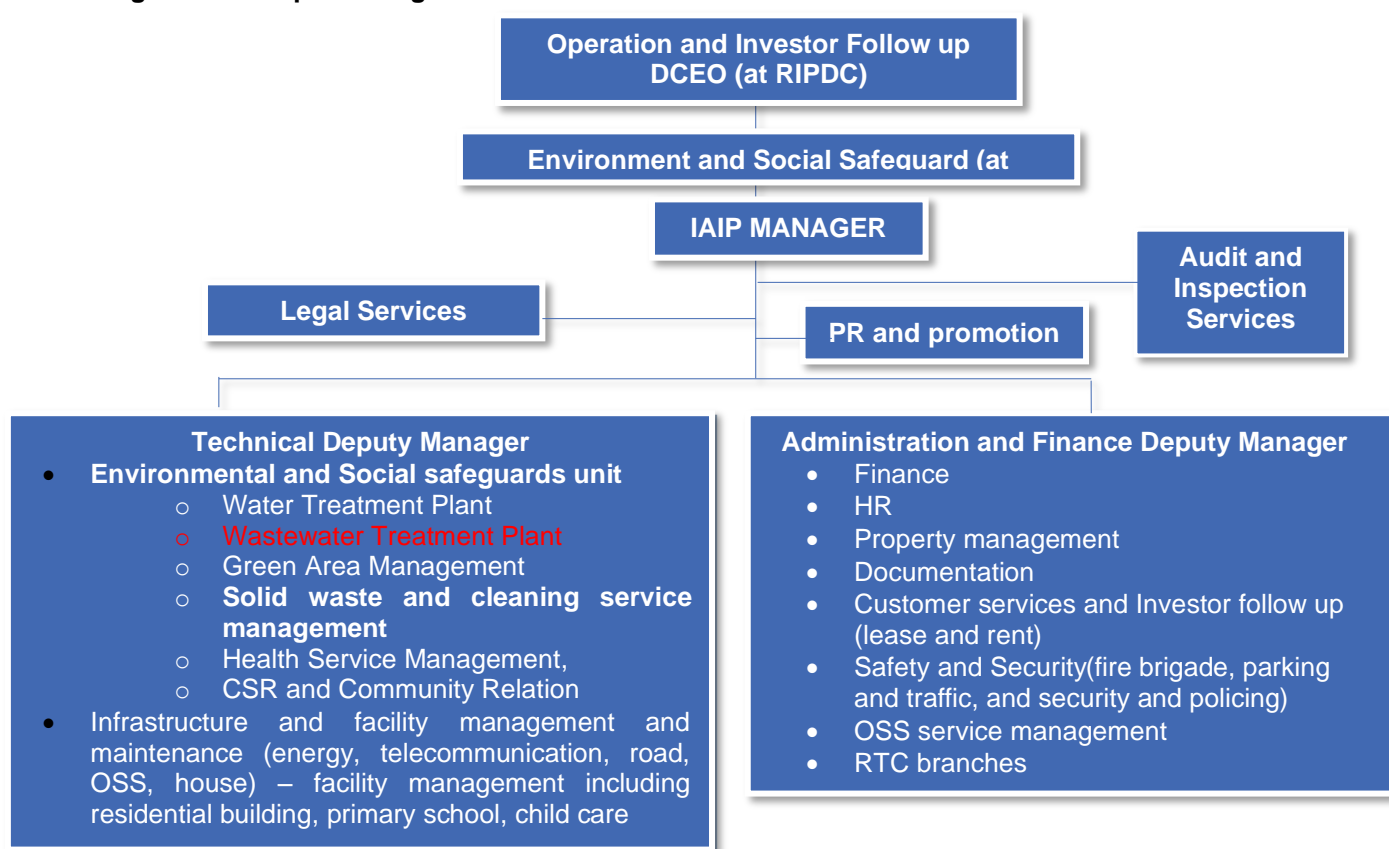
### 3.1. Alternative Management Model

IAIP/RTC can outsource solid waste management by management contracting or it can handle internally. Due to the diversity and complexity of the waste nature from agro industry processing, outsourcing integrated solid waste management operational services is recommended. However supervision and controlling of the standard compliance of solid waste management shall be internally performed.

### 3.2. Organizational Structure and Human Resource Requirement

The recommended park level organization structure and its relationship with RIPDC is given in Figure 3.1.

**Figure 3.1: Proposed Organizational Structure of IAIP/RTC**

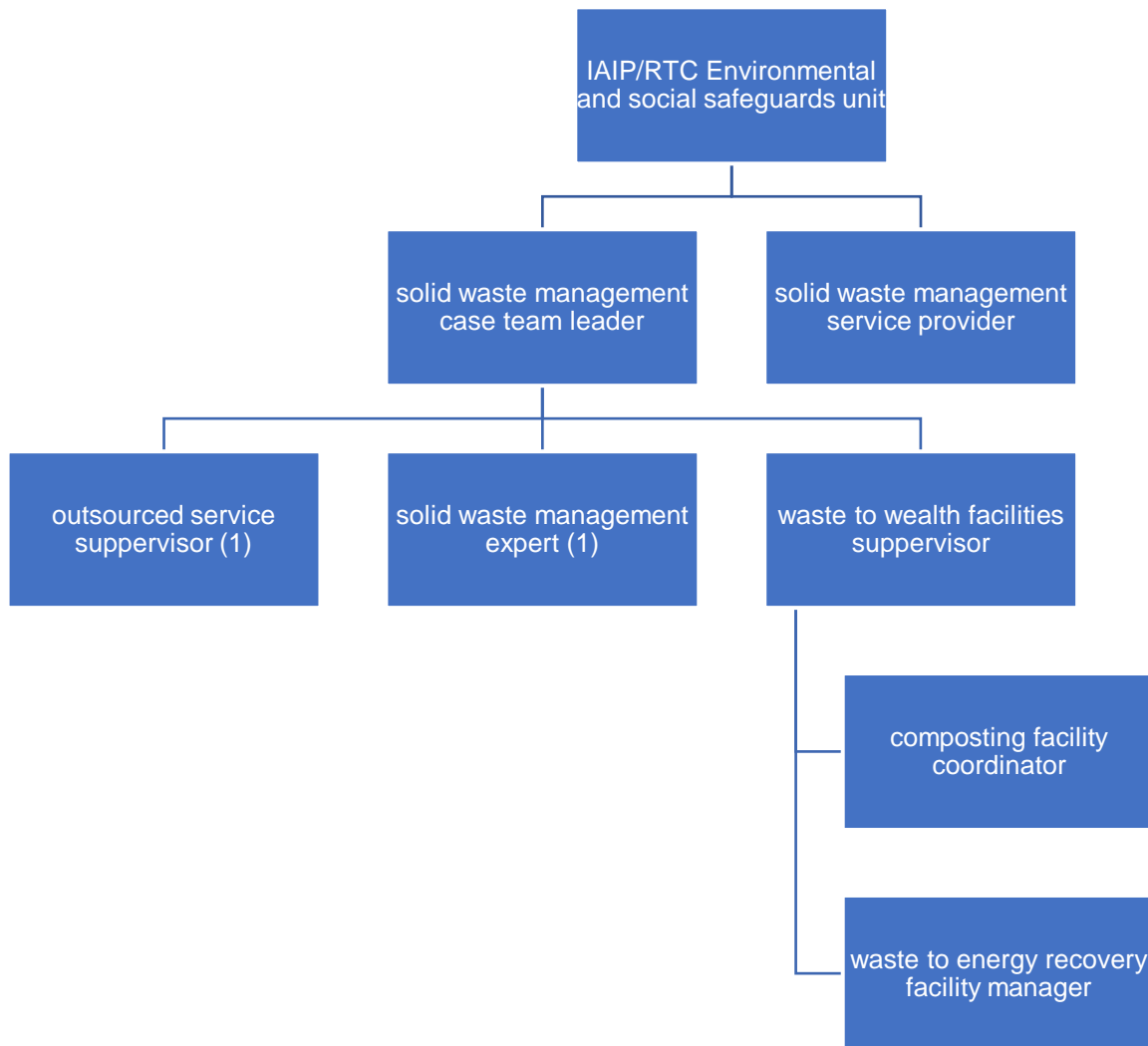


### 3.3. Reporting Structure

The solid waste management system shall use the following reporting chain of command, mandatory to be respected by all the workers of the environmental and social safeguard unit which is under the technical deputy Manger who in turn report to the Manger of the park. All the workers of solid waste management shall report to solid waste management case team leader. The detail of the solid waste management structure is given in Figure 3.2.



**Figure 3.2: the detail organization structure of solid waste management at IAIP/RTC**



### 3.4. Roles and Responsibility of Stakeholders

The roles and responsibilities of stakeholder of IAIP/RTC include;

- ✓ Source segregation and storage by waste generator (at least 3 types of bins shall be available for weekly storage at each facilities)
- ✓ Collection and transportation shall be handled by IAIP/RTC though service outsourcing is possible
- ✓ Municipal inert solid waste disposal shall be treated or disposed on municipalities land fill
- ✓ Reusable and recyclable waste shall be handled by waste treatment facility operators
- ✓ Individual tenants can sell or reuse any discarded waste materials
- ✓ Cost of waste to wealth shall be covered by end product/services user.

More importantly, the following investment opportunities can be handled by private/public or both investors:

- ✓ Collection from each tenant can be done by SME
- ✓ Composting plant can be handled by universities
- ✓ Biogas production can be done by private investor or it can be consider as a part of tenant investors cost sharing for energy generation
- ✓ Recycling and reselling of reusable materials can be handled by individual tenant investors

### 3.5. Minimum Competencies for Solid Waste Management

S/No	Position and number of posts	Educational background and experience	Job descriptions or tasks for the positions	Remarks
1.	solid waste management case team leader-1	Environmental health, environmental science or related Bsc 1 year experience	<ul style="list-style-type: none"> <li>• Coordination of solid waste management services</li> <li>• Planning all integrated solid waste management</li> <li>• Monitoring and follow up of solid waste management compliance requirements</li> </ul>	
2.	outsourced service supervisor-1	Management or related Bsc zero year experience	<ul style="list-style-type: none"> <li>• Managing outsourced services providers as per agreement</li> <li>• Comply with tenant investors' satisfaction</li> </ul>	
3.	solid waste management expert-1	Environmental health, environmental science or related Bsc zero year experience	<ul style="list-style-type: none"> <li>• Supervising tenants waste management practices</li> <li>• Conducting regular inspection for tenants and facilities</li> </ul>	
4.	waste to wealth facilities supervisor-1	Environmental health, environmental science or related Bsc 5 relevant year experience	<ul style="list-style-type: none"> <li>• Coordination of resource recovery services</li> <li>• Planning all waste to wealth actions</li> <li>• Monitoring and follow up of composting and waste to energy compliance requirements</li> </ul>	
5.	composting facility coordinator-1	Environmental health, environmental science or related Bsc zero year experience	<ul style="list-style-type: none"> <li>• Collect all composting raw materials</li> <li>• Planning and implementation of different technologies</li> <li>• Managing composting plants</li> <li>• Produce quality compost</li> <li>• Sell compost</li> </ul>	
6.	waste to energy recovery facility manager-1	Chemical engineering, environmental engineering environmental science or related Bsc zero year experience	<ul style="list-style-type: none"> <li>• Collect all digestible raw materials</li> <li>• Planning and implementation of different technologies</li> <li>• Managing biogas plants</li> <li>• Produce quality methane gas</li> <li>• Sell methane gas for users</li> </ul>	
7.	Daily laborer for	-	As required	

## 4. STANDARD OPERATING PROCEDURE

### 4.1. General Waste Management Procedures (Non-Hazardous)

This manual applies to companies or facilities that generate, store, or handle any quantity of waste across a range of industry sectors. It is not intended to apply to companies or facilities where the primary business is the collection, transportation, treatment or disposal of wastes. Specific guidance for these types of facilities is presented in the Environmental Health and Safety (EHS) Guidelines for Waste Management Facilities.

#### 4.1.1. Waste Management Planning

Effective planning and implementation of waste management strategies should include:

- ✓ Review of new waste sources during planning, siting, and design activities, including during equipment modifications and process alterations, to identify expected waste generation, pollution prevention opportunities, and necessary treatment, storage, and disposal infrastructure
- ✓ Collection of data and information about the process and waste streams in existing facilities, including characterization of waste streams by type, quantities, and potential use/disposition
- ✓ Establishment of priorities based on a risk analysis that takes into account the potential EHS risks during the waste cycle and the availability of infrastructure to manage the waste in an environmentally sound manner
- ✓ Definition of opportunities for source reduction as well as reuse and recycling
- ✓ Definition of procedures and operational controls for onsite storage
- ✓ Definition of options / procedures / operational controls for treatment and final disposal

#### 4.1.2. Waste Prevention

Processes should be designed and operated to prevent or minimize the quantities of wastes generated and hazards associated with the wastes in accordance with the following strategy:

- ✓ Substituting raw materials or inputs with less hazardous or toxic materials, or with those where processing generates lower waste volumes
- ✓ Applying manufacturing process that convert materials efficiently, providing higher product output yields, including modification of design of the production process, operating conditions, and process controls
- ✓ Instituting good housekeeping and operating practices, including inventory control to reduce the amount of waste resulting from materials that are out-of-date, off specification, contaminated, damaged or excess to plant needs
- ✓ Instituting procurement measures that recognize opportunities to return usable materials such as containers and waste which prevents the over ordering of materials
- ✓ Minimizing hazardous waste generation by implementing stringent waste segregation to prevent the commingling of non-hazardous and hazardous waste to be managed

#### 4.1.3. Recycling and Reuse

In addition to the implementation of waste prevention strategies, the total amount of waste may be significantly reduced through the implementation of recycling plans, which should consider the following elements:

- ✓ Evaluation of waste production processes and identification of potentially recyclable materials
- ✓ Identification and recycling of products that can be reintroduced into the manufacturing process or industry activity at the site
- ✓ Investigation of external markets for recycling by other industrial processing operations located in the neighborhood or region of the facility (e.g., waste exchange)

- ✓ Establishing recycling objectives and formal tracking of waste generation and recycling rates
- ✓ Providing training and incentives to employees in order to meet objectives

#### **4.1.4. Treatment and Disposal**

If waste materials are still generated after the implementation of feasible waste prevention, reduction, reuse, recovery and recycling measures, waste materials should be treated and disposed of and all measures should be taken to avoid potential impacts to human health and the environment. Selected management approaches should be consistent with the characteristics of the waste and local regulations, and may include one or more of the following;

- ✓ On-site or off-site biological, chemical, or physical treatment of the waste material to make it nonhazardous prior to final disposal
- ✓ Treatment or disposal at permitted facilities specially designed to receive the waste. Examples include: composting operations for organic non-hazardous wastes; properly designed, permitted and operated landfills or incinerators designed for the respective type of waste; or other methods known to be effective in the safe, final disposal of waste materials such as bioremediation.

## **4.2. General Hazardous Waste Management Procedures**

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### **4.2.1. General Management Principles**

Hazardous wastes should always be segregated from nonhazardous wastes. If generation of hazardous waste cannot be prevented through the implementation of the above general waste management practices, hazardous waste management should focus on the prevention of harm to health, safety, and the environment, according to the following additional principles;

- ✓ Understanding potential impacts and risks associated with the management of any generated hazardous waste during its complete life cycle
- ✓ Ensuring that contractors handling, treating, and disposing of hazardous waste are reputable and legitimate enterprises, licensed by the relevant regulatory agencies and following good international industry practice for the waste being handled
- ✓ Ensuring compliance with applicable local and international regulations

### **4.2.2. Hazardous Waste Storage**

Hazardous waste should be stored so as to prevent or control accidental releases to air, soil, and water resources in area location where;

- ✓ Waste is stored in a manner that prevents the commingling or contact between incompatible wastes, and allows for inspection between containers to monitor leaks or spills. Examples include sufficient space between incompatibles or physical separation such as walls or containment curbs
- ✓ Store in closed containers away from direct sunlight, wind and rain
- ✓ Secondary containment systems should be constructed with materials appropriate for the wastes being contained and adequate to prevent loss to the environment
- ✓ Secondary containment is included wherever liquid wastes are stored in volumes greater than 220 liters. The available volume of secondary containment should be at least 110 percent of the largest storage container or 25 percent of the total storage capacity (whichever is greater), in that specific location
- ✓ Provide adequate ventilation where volatile wastes are stored.

Hazardous waste storage activities should also be subject to special management actions conducted by employees who have received specific training in handling and storage of hazardous wastes on:

- ✓ Provision of readily available information on chemical compatibility to employees, including labeling each container to identify its contents
- ✓ Limiting access to hazardous waste storage areas to employees who have received proper training
- ✓ Clearly identifying (label) and demarcating the area, including documentation of its location on a facility map or site plan
- ✓ Conducting periodic inspections of waste storage areas and documenting the findings
- ✓ Preparing and implementing spill response and emergency plans to address their accidental release (additional information on Emergency Plans)
- ✓ Avoiding underground storage tanks and underground piping of hazardous waste

#### **4.2.3. Transportation**

On-site and off-site transportation of waste should be conducted so as to prevent or minimize spills, releases, and exposures to employees and the public. All waste containers designated for off-site shipment should be secured and labeled with the contents and associated hazards, be properly loaded on the transport vehicles before leaving the site. It should also be accompanied by a shipping paper (i.e., manifest) that describes the load and its associated hazards consistent with the guidance provided in the Transport of Hazardous Materials.

#### **4.2.4. Treatment and Disposal**

In addition to the recommendations for treatment and disposal applicable to general wastes, the following issues specific to hazardous wastes treatment and disposal should be considered.

#### **4.2.5. Commercial or Government Waste Contractors**

In the absence of qualified commercial or government-owned waste vendors (taking into consideration proximity and transportation requirements), facilities generating waste should consider and shall have:

- ✓ the technical capability to manage the waste in a manner that reduces immediate and future impact to the environment
- ✓ all required permits, certifications, and approvals, of applicable government authorities
- ✓ been secured through the use of formal procurement agreements

In the absence of both the above waste disposal operators (taking into consideration proximity and transportation requirements), project sponsors should consider using:

- ✓ Installing on-site waste treatment or recycling processes
- ✓ As a final option, constructing facilities that will provide environmentally sound long-term storage of wastes on-site or at an alternative appropriate location up until external commercial options become available

#### **4.2.6. Small Quantities of Hazardous Waste**

Hazardous waste materials are frequently generated in small quantities by many companies through a variety of activities such as equipment and building maintenance activities. Examples of these types of wastes include:

- ✓ spent solvents and oily rags,
- ✓ empty paint cans,
- ✓ chemical containers;
- ✓ used lubricating oil;
- ✓ used batteries (such as nickel-cadmium or lead acid); and
- ✓ lighting equipment, such as lamps or lamp ballasts. These wastes should be managed following the guidance provided in the above sections.

#### **4.2.7. Monitoring of Hazardous Waste Management**

Monitoring activities associated with the management of hazardous and non-hazardous waste should include:

- ✓ Regular visual inspection of all waste storage collection and storage areas for evidence of accidental releases and to verify that wastes are properly labeled and stored. When significant quantities of hazardous wastes are generated and stored, on site monitoring activities should include:
  - Inspection of vessels for leaks, drips or other indications of loss
  - Identification of cracks, corrosion, or damage to tanks, protective equipment or floors
  - Verification of locks, emergency valves and other safety devices for easy operation (lubricating if required and employing the practice of keeping locks and safety equipment in standby position when the area is not occupied)
  - Checking the operability of emergency systems
  - Documenting results of testing for integrity, emissions or monitoring stations (air, soil vapor, or groundwater)
  - Documenting any changes to the storage facility and any significant changes in the quantity of materials in storage
- ✓ Regular audits of waste segregation and collection practices
- ✓ Tracking of waste generation trends by type and amount of waste generated preferably by facility departments
- ✓ Characterizing waste at the beginning of generation of a new waste stream and periodically documenting the characteristics and proper management of the waste, especially hazardous wastes
- ✓ Keeping manifests or other records that document the amount of waste generated and its destination
- ✓ Periodic auditing of third party treatment and disposal services including re-use and recycling facilities when significant quantities of hazardous wastes are managed by third parties. Whenever possible, audits should include site visits to the treatment storage and disposal location
- ✓ Regular monitoring of groundwater quality in cases of hazardous waste on site storage and/or pretreatment and disposal
- ✓ Monitoring records for hazardous waste collected, stored or shipped should include:
  - Name and identification number of the material(s) composing the hazardous waste
  - Indicate physical state (i.e., solid, liquid, gaseous or a combination of one, or more, of these)
  - Measure the quantity (e.g., kilograms or liters, number of containers)
  - Document waste shipment tracking including; quantity and type, date dispatched, date transported and date received, the originator, the receiver and the transporter
  - Record method and date of storing, repacking, treating, or disposing at the facility, cross-referenced to specific manifest document numbers applicable to the hazardous waste
  - Document location of each hazardous waste within the facility and the quantity at each location

### 4.3. Sector Specific Solid Waste Management Procedure

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#### 4.3.1. Dairy Processing

Solid organic waste in dairy processing facilities mainly originates from production processes and includes nonconforming products and product losses (e.g. milk spillages liquid whey and buttermilk), grid and filter residues, sludge from centrifugal separators and wastewater treatment and packaging waste (e.g. discarded cuts, spent ripening bags, wax residues from cheese production) arising from incoming raw materials and production line damage. To reduce and manage such solid waste procedure includes the following:

- Where possible and subject to sanitary requirements, **segregate** solid process waste

and non-conforming products for reprocessing into commercial products and byproducts (e.g. butter oil, processed cheese, animal feed, soap stock, or other technical-grade materials);

- Optimize product filling and packaging equipment to avoid product- and packaging-material waste;
- Optimize the design of packaging material to reduce the volume of waste (e.g. by using recycled materials and by reducing the thickness without compromising food safety criteria). If PET bottles are blown on site, plastic waste cuttings can be reused, or should be sorted as plastic waste for off-site recycling or disposal;
- Use uncontaminated sludge from on-site wastewater treatment for agricultural fertilizer or production of biogas.
- Remaining waste should be managed and disposed of according to local waste management practices.

#### 4.3.2. Meat Processing

Meat-processing industry slaughters animals and produces primary carcass products, processed cuts, and a variety of byproducts. The rendering industry processes the parts not used for human consumption for technical use and for use as animal feed. This activity may generate large quantities of solid waste including the manure and bedding material generated during animal transport and lair age activities as well as waste from processing steps.

Waste products and by-products of slaughtering processes can generally be divided into the following categories:

1. Manure, contents of the rumen and intestines;
2. edible products such as blood and liver;
3. inedible products such as hair, bones, feathers;
4. fat(recovered from the wastewater by means of fat-separators); and
5. Non-recoverable waste materials that require final disposal. The quantity of by-products from cattle often exceeds 50 percent of the animal's live weight, and 10 to 20 percent for pigs.

Procedure to reduce and manage such solid waste include managing the following waste products including;

#### ***Sick and Diseased Animals***

Animals that die during transport, and sick or dead animals from quarantine pens should be separated and transported to external facilities in separate containers for treatment and final disposal. Depending on the risk classification of the animal including whether diseases such as suspected for ( name of the diseases here) needs typical disposal procedures for sick or dead animals include the following:

- Collecting animals not approved by veterinary inspection and segregating them from animal materials sent by the slaughterhouse for off-site rendering. This segregation is necessary because the treatment processes in off-site rendering plants can entail higher pressure, temperature and duration in accordance with the risk classifications of the waste materials.
- Storing carcasses until collection to prevent putrefaction, odors and attraction of vectors, using cooling if necessary, should be used. Storage times should be minimized to avoid energy intensive cooling requirements.
- Transformation in a biogas or composting plant after **pressure sterilization**;
- Using a reliable collection company approved by local authorities that disposes of carcasses by rendering, with adequate time, temperature and pressure criteria for sanitization or incineration / co-incineration depending on the cause of fatality;
- Where no authorized collection of carcasses is available, and after approval of the local

veterinary authorities, incinerating or burying carcasses on site if allowed should be done. Whether on site or off site, the burial area should be accessible to earth-moving machinery and have stable and low-permeability soils with sufficient physical separation from houses and water resources to avoid contamination by vapors or leachate from buried and decaying materials.

### ***Solid Animal Wastes for Reprocessing***

Reprocessing of solid animal waste into commercial by-products should consider the following:

- Specific control measures should be taken to segregate and manage high-risk tissues according to the recommended SWM practices discussed above;
- Avoid processing of waste materials for same species feeding;
- Use bones, trim, scraps, hooves, horns and other detritus (not otherwise used beneficially for the production of stable meals, for example, bone meal) in-house or sell to third parties;
- Clean stomach for use as food, feed, or pet food;
- Clean intestines for use as food or sausage casings;
- Recover fat from cut-offs, intestines, and hides for use as animal feed, if collected in relatively pure form. Tallow can alternatively be used as a bio-fuel or for soap among other uses;
- Remove mucosa from small pig casings (the mucous membrane of the small intestine) rather than disposing in the wastewater stream.
- Curtail animal feeding 12 hours before slaughtering to reduce manure production and reduce the risk of contamination of the carcasses with manure and digestive tract content during slaughter;
- Provide sufficient manure storage capacity until the manure is transported for agricultural and other uses;
- Collect and compost stomach and intestinal contents and manure (preferably removed in “dry” form without mixing into the effluent, and provided it does not come from diseased animals) for use as compost or other agricultural application. In the case of bovine slaughter, the cattle’s first stomach has a considerable organic material content (approximately 10, 40, and 50 kg for veal calves less than one-year-old, bulls, and cows, respectively)

### **4.3.3. Sludge from Wastewater Treatment**

The following measures should be considered to further reduce the volume of waste generated from wastewater treatment processes:

- Segregate wastewater containing manure and digestive tract content (e.g. from reception of live animals, lairage, cleaning of trucks and specific areas in the casing department). Screened materials from these areas can be used as fertilizers on agricultural land;
- Reuse materials that may be separated from pretreatment processes (e.g. screened materials, suspended solids, and emulsified fats from flotation) in the manufacture of high quality by-products (e.g. pet food or technical fat for oleo chemicals manufacturing);
- Increase the quality of the sludge for possible use as agricultural fertilizer by reducing or eliminating water, pathogens such as *E. coli*, *campylobacter*, and *salmonella* through controlled aerobic treatment (compost) or anaerobic digestion (bio-gas);
- Treat materials with high organic content (e.g. blood, fat and manure) anaerobically for the purpose of generating and using bio-gas as an energy source;
- If no other alternatives are feasible, dispose of dry sludge at landfills



#### **4.3.4. Poultry Processing**

Generation of organic solid waste include the following:

- Halting feeding 6 to 10 hours before transport to reduce the volume of excreta to be removed after transport or slaughter. Provision of adequate slurry storage capacity for excreta until it is transported for disposal or for use as agricultural fertilizer should be practiced
- Reprocessing as much of the low-risk and high-risk material as possible.
- Since disposal of high-risk material is typically conducted through off-site rendering in an energy intensive process, avoiding mixing low-risk and high-risk materials is recommended. A mixture of low-risk and high-risk materials should be classified as high-risk material and treated accordingly
- Examples of reprocessing opportunities for low-risk material include use of feathers and down from waterfowl in garments and household items; use of heat treated products as animal feed for pigs, fish and shrimp production; and use of poultry feet for human consumption
- For low-risk material that cannot be reprocessed into byproducts, alternative treatments such as acidification, biogas production, and use as agricultural fertilizers, and incineration should be considered. Incineration should only be conducted in permitted facilities operating under international recognized standards for pollution prevention and control.

#### **4.3.5. Other Industrial and Municipal Solid Wastes**

Other solid industrial waste management should follow procedures including;

- ✓ Any organic wastes from food processing (like vegetable, cereal etc) and domestic uses, shall be sent to be reprocessed for composting and biogas production.
- ✓ Reusable scraps (plastics, metal, wood, cartoon etc ) shall be sold for recyclers
- ✓ Other inert municipal solid wastes shall be sent to nearby municipality land fill

## 5. MONITORING AND EVALUATION (KPI)

For the realization of integrated solid waste management, the following basic principles need to be considered:-

- Solid waste management process must be participatory.
- Solid waste should be considered as a wealth;
- Development of programs in solid waste management must be based on local resources;
- All public, private and community stakeholders should play a key role in solid waste management activities;
- Solid waste should be reduced at its source;
- The overall management and administration should monitor and evaluate the solid waste activities from its generation up to the solid waste final disposal;
- The solid waste management should consider long term vision; and
- Integrated solid waste management should be flexible to accommodate unforeseen problems.

In addition, the following actions are considered as benchmarks for monitoring and evaluation of the waste management practices in IAIP/RTC:-

- ✓ Prepare management plan
- ✓ Prepare records of waste types and amounts generated per day, monthly or yearly
- ✓ At least 3 types of waste bin preparation (degradable, non-degradable and reusable) should be used for work site waste collection
- ✓ Labelling the bins based on the waste to be dispose on it
- ✓ Providing training for workers on waste management and safe worksite
- ✓ Prepare waste collection garbage based on their type and label it (degradable, non-degradable and reusable)
- ✓ Prepare cover for all garbage and garbage's must be far away from any facility
- ✓ Fence the site and protect from any contact
- ✓ Prepare labelling the fenced site
- ✓ Provide PPE for in-house waste collector
- ✓ Prepare agreement for waste collector to transport waste timely and safely
- ✓ Prepare appropriate price for disposable waste collection, transportation and disposal based on the volume of waste and its type
- ✓ Sell reusable waste or reuse again
- ✓ Conduct waste audit
- ✓ Mitigate if any risks or if any non-compliances
- ✓ Monitor the system effectiveness and report compliances to appropriate institution

The major KPIs' are stated in the table below:

**Table 5.1: Important Solid Waste Management (KPIs)**

S/No	Description of the guidance	Indicator	Remarks
1.	Waste generation	kg/cap/day	
2.	Waste composition and type of generated waste	(kg/m <sup>3</sup> ) and Corresponding Weight	
3.	existing systems of solid waste management practices assessment		
3.1.	actors involved in waste recycling	Name and Number	
3.2.	Actors involved in composting	Name and Number	
3.3.	Actors involved in transportation	Name and Number	
3.4.	Payment for actors or charges from actors	Type of services and payment amount	
3.5.	<b>Quantity and price of collected recyclables</b>	Birr/kg	
4.	Institutional capacities and weakness	Strength and weakness Analysis report	
5.	Assessment of Investors need	Need assessment and identified challenges	
6.	Possible options for recycling and zero waste	List of options for each type of waste	
7.	Amount of solid waste sent to land fill	percentage	
8.	Amount of solid waste reused/recycled	percentage	

## 6. COST RECOVERY MECHANISM FOR SOLID WASTE MANAGEMENT

Cost of solid waste management shall be covered from:

- ✓ Resources recovery activities like compost selling and alternative energy selling
- ✓ Solid waste management fee collection
- ✓ Reselling of reusable materials



PRO  
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# Integrated agro industry parks and rural transformation center wastewater management & operation manual



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## LIST OF ABBREVIATION AND ACRONYMS

- BOD-** Biological Oxygen Demand
- CETP-**Common Effluent Treatment Plant
- COD-**Chemical Oxygen Demand
- EHS-**Environment, Health and Safety
- FAO-**Food and Agriculture Organizations
- GIIP-** Good International Industry Practice
- IAIP-**Integrated Agro Industry Park
- RIPDC-** Regional industrial Parks Development Corporation
- RTC-**Rural Transformation Center
- STP-**Sewage Treatment Plants
- TDS-**Total Dissolved Solids
- TN-** Total Nitrogen
- TP-**Total Phosphorus
- TSS-** Total Suspended Solids
- WHO-**World Health Organization
- WWTP-**Wastewater Treatment Plants

## DEFINITION

**Influent-** wastewater coming from its sources of the generation

**Effluent-** wastewater at the point of discharge

**Wastewater-** the liquid by-product from activity

**Parameters-** pollutants in the wastewater

**Sewage-** refers to water of which the original characteristics have changed after usage. This includes wastewater coming out from kitchen, bathroom, laundry, washing, and toilet, business building, commercial and service building, and recreational center

**Wastewater collection system-** refers to collection and conveyance systems – conduit connection, manhole and sewerage conduit (combined sewer, separate sewer, main pipeline, secondary pipeline, tertiary pipeline and lateral pipeline)

**Combined-** refers to sewer collecting and conveying both sewage and industrial wastewater together

**Sludge-** refers to wet mud or waste resulting from the septic tank or sewage treatment plant

**Central wastewater treatment plant:** refers to a treatment plant which is used to treat wastewater from everywhere in the IAIP/RTC

# 1. INTRODUCTION

The purpose of wastewater treatment plants has been to protect the health and wellbieng of communities. Wastewater operations accomplish this goal by:

- Preventionn of disease and nuisance
- Avoidance of water contamnants
- Maintenance of clean water for reuse
- Conservation of quality water for future use

These goals can be achieved through understanding of:

- Wastewater characterstics (physical, chemical and biological contents of wastewater)
- Wastewater collection system
- Priliminary treatment system
- Primary treatments
- Secondary treatments
- Tertiary treatment
- Treated wastewater reuse options and
- Sludge handling

The major challenges of wastewater treatment plants operation are:

- Limited finance for construction and operation
- Complying with regulations and standards
- Maintaining infrastructure
- Bench marking
- Technical versus professional management
- Cost recovery and sustainability

Hence, this manual will improve wastewater treatment plants' operator efficiency and effectiveness by setting minimum operating procedural guidance.

## 1.1. Purpose and Scope of the Manual

Raw wastewater contains BOD, COD, TSS and other harmful pollutants for the environment. This harmful wastewater should be removed. The presence of these pollutants in the wastewater requires suitable treatment plants to treat and reuse the treated wastewater for industrial processing (not as food ingredients), toilet flushing, irrigation, cleaning, gardening and other process use.

Therefore, the scope of this manual is to manage both sewage and industrial wastewater at IAIP/RTC. This manual is and will not replace suppliers and manufactures operation and maintenance manuals to be prepared for each technology. The manual is just how to manage wastewater.

## 1.2. Updating frequency and Procedure

This manual could be updated based on the actual scenario of the IAIP/RTC wastewater treatment practices. In addition, it can be updated based on the built design and suppliers operation and maintenance manuals.



## 2. STANDARDS, NORMS AND REGULATIONS

The basic legal frameworks for wastewater management are;

- Pollution Control Proclamation No.300/2002
- Effluent Standards Promulgated in 2011 and its updates
- IFC; 2007 Wastewater Management EHS Guidelines

## 3. MANAGEMENT MODEL

### 3.1. Alternative Management Model

Management and operation of wastewater treatment plant can be outsourced after contractor or supplier testing and commissioning of wastewater treatment plants for **at least 6** months. Since, wastewater treatment is the core for investment supporting facilities. Local operating company (operator) should manage the plant while IAIP/RTC (client) should manage internal control and supervision. In addition, spare parts, chemicals and consumable supplies can be outsourced for local producers or suppliers. More importantly, until internal capacity is ensured, wastewater operation and maintenance services can be outsourced based on the client preference.

The required wastewater treatment operation and maintenance services are:

1. Improving organizational capabilities (continuous and intensive practical on job training to transfer knowledge and technology)
2. Process chemicals, laboratory chemicals and reagents supply management
3. Spare parts and consumables supply
4. Maintenance services
5. Cost recovery and financial sustainability
6. Monitor and control pollution load and volume at factory level
7. By-product (sludge) management
8. Running the plant and operation

From these services number 1, 5, 7 and 8 can be handled by IAIP/RTC while others shall be outsourced for competent company. On the other hand, except number 5, all services can be outsourced for one competent company. Outsourcing makes operation easy for the IAIP/RTC as it allows IAIP/RTC to focus on the main business services.

### 3.2. Human Resource Requirement

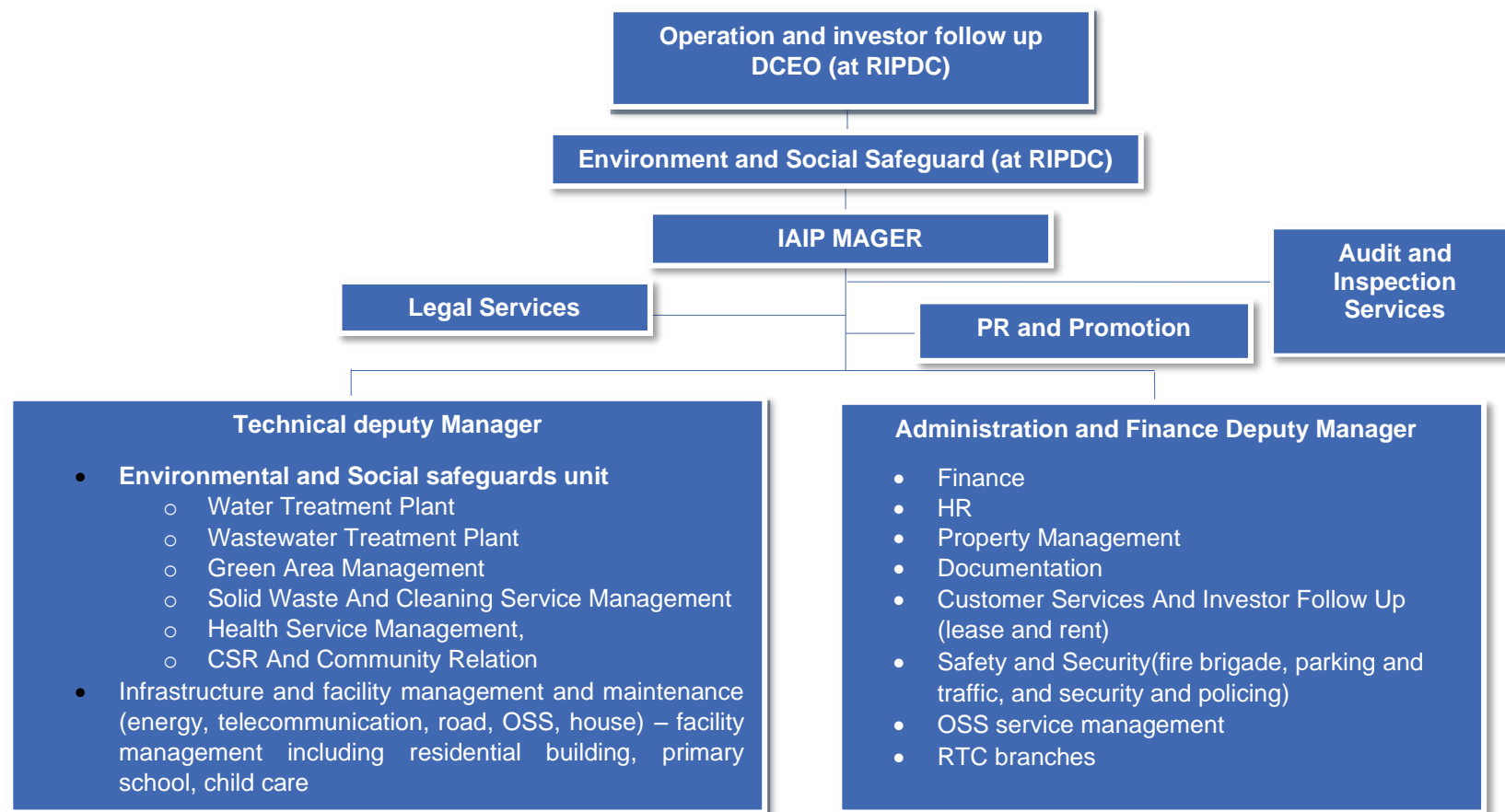
If the plant wants to manage solid waste by internal staff, the client shall fulfill at least the following multidisciplinary staffs:

- Four Process Team Leader- Environmentalist/chemist who have at least 4 years relevant experiences
- Four Mechanical Technicians- who have at least 4 years relevant experiences
- Four Electrical and Instrumentation Technicians-who have at least 4 years relevant experiences
- Four Quality Control Laboratory Technicians- who have at least 4 years relevant experiences

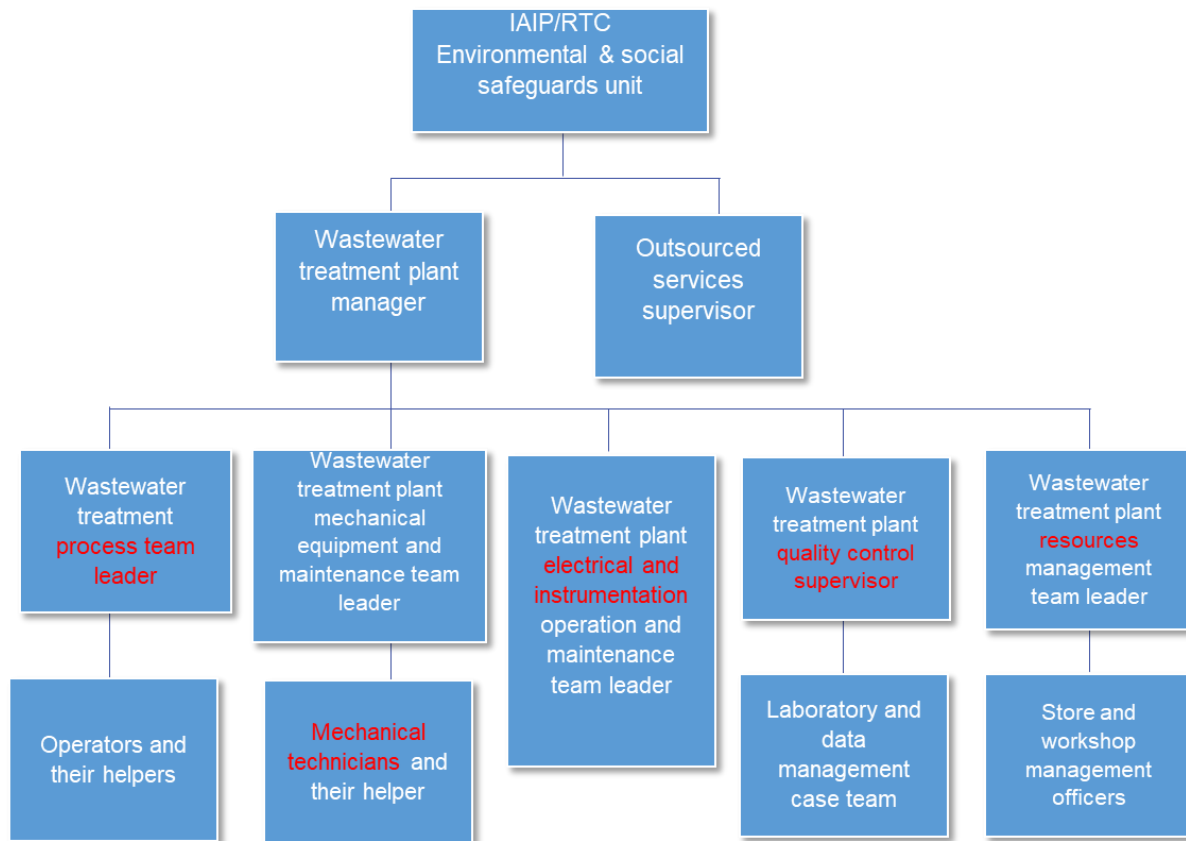
- Four Chemical Resources Management Chemists- who have at least 2 years relevant experiences with at least diploma in chemistry or applied chemistry.
- Four Equipment and Material Supply Management Mechanical Technicians- who have at least 2 years of experiences with at least general mechanic diploma
- Twenty-eight (28) Operators – who have at least 4 years relevant experience having at least general mechanic diploma and **CoC**
- Four Data Management and Sample Encoder Officers—who have B.Sc. in Chemistry with zero year experiences
- Fifty-six (56) Helpers –who have diploma in general mechanic/electricity or relevant
- One Plant Manager- who have at least 8 years of experiences in managing similar plants or related project operations. The educational background shall be in Environmental Science/Chemical Engineering/Mechanical Engineering or related as B.Sc. holder.
- One Deputy Plant Manager- who have at least 6 years of experiences in managing similar plants or related project operations. The educational background shall be In Environmental Science/Chemical Engineering/Mechanical Engineering or related B.Sc. holder.

The total human resource requirement for the plant is about 115. The proposed organizational structure of the IAIP showing its relationship with the concerned unit of RIPDC is given in Figure 3.1 while the detailed organizational structure of liquid waste management is given in Figure 3.2.

**Figure 3.1: Proposed Organizational Structure of IAIP/RTC**



**Figure 3.2: Detail of Organizational Structure of Liquid Waste Management of IAIP**



### 3.3. Reporting Structure

The liquid waste management system shall use the following reporting chain of command, mandatory to be respected by all the workers of the environmental and social safeguard unit which is under the technical deputy Manager who in turn report to the Manager of the park. All the workers of liquid waste management shall report to Liquid Waste Management Manager.

### 3.4. Roles and Responsibilities

Management of wastewater treatment is complex and needs special attention for the parks sustainability. Hence, RIPDCs shall establish the following management and operation supervisions with minimum roles the team plays. Accordingly, each party plays the following roles and responsibilities;

#### 1.1.1. Roles of RIPDC Management:

- Approve wastewater treatment operation and management plan
- Establish the separate management team
- Evaluating the management team reports and provide directions

#### 1.1.2. Roles and Responsibilities of the Management Teams

- Understand plant performance from third party report
- Approve detail action plan of the plant
- Monitor and evaluate plan execution and submit to RIPDC Management

- Conduct field visit on implementation progress
- Conduct regular meeting every 2 weeks
- Supervise the operator

#### 1.1.3. Roles of Contractors (for 6 months)

- Provide adequate technology and knowledge transfer
- Participate in the management team
- Executing identified gaps and create adequate capabilities of local staff on the same cases
- Based on demand and approved requests of RIPDC, supply inputs (chemicals, reagents, spare parts and consumables)
- Mentor and consult on day to day operation and maintenance activities
- Avail all necessary working documents, approved as built design, tests reports, sops etc.
- Establish strong and committed team
- Submit third party plant audit report
- Assure local staff competency on the provided trainings

#### 1.1.4. Role of IAIP/RTC Management

- Support and have close follow up of wastewater treatment plant
- Avail necessary inputs to achieve goals

#### 1.1.5. Internal Staff Role and Responsibilities

S.No	Position	Role of the post	Remarks
1.	Process Team Leader	<ul style="list-style-type: none"> <li>• Coordinating shift operation tasks</li> <li>• Plant process control</li> </ul>	
2.	Mechanical Technicians	<ul style="list-style-type: none"> <li>• Maintenance of the mechanical equipment's</li> <li>• Change spares and installations</li> </ul>	
3.	Electrical and Instrumentation Technicians	<ul style="list-style-type: none"> <li>• Maintenance of the electrical equipment's</li> <li>• Change spares and installations</li> <li>• PLC/SCADA control and operations</li> </ul>	
4.	Quality Control Laboratory Technicians	<ul style="list-style-type: none"> <li>• Conduct tests and keep records</li> <li>• Recommend improvement plans</li> </ul>	
5.	Chemical Resources Management Chemist	<ul style="list-style-type: none"> <li>• Request and purchase chemicals</li> <li>• Keep chemicals records and improvement plans</li> <li>• Conduct inventory</li> </ul>	
6.	Equipment And Material Supply Management Mechanical Technician	<ul style="list-style-type: none"> <li>• Request and purchase equipment and material</li> <li>• Keep equipment and material records and improvement plans</li> <li>• Conduct inventory</li> </ul>	
7.	Operators Data	<ul style="list-style-type: none"> <li>• Run the system as per the O&amp;M manual</li> <li>• Report and plan daily operations</li> </ul>	
8.	Management and Sample Encoder Officers	<ul style="list-style-type: none"> <li>• Record plant data daily</li> <li>• Notify the manager to prepare reports</li> </ul>	
9.	Helpers	<ul style="list-style-type: none"> <li>• Assist operators and technicians</li> </ul>	
10.	Deputy Plant Manager	<ul style="list-style-type: none"> <li>• Coordinate outsourced services</li> <li>• Control human resources</li> <li>• Control administrative tasks</li> </ul>	
11.	Plant Manager	<ul style="list-style-type: none"> <li>• Coordinate all plant tasks</li> <li>• Control functionality of the plants</li> <li>• Approve both technical and administrative tasks</li> </ul>	

## 4. STANDARD OPERATING PROCEDURE

Since the volume and the characteristics of wastewater from IAIP/RTC are huge, environmental pollution, reduction mechanisms shall be in place to comply with national and international environmental standards.

There are two models to build wastewater treatment plants for such industrial clusters. One model has centralized common wastewater treatment and the other has decentralized wastewater treatment. In the case of IAIP/RTC, the Consultant has recommended centralized common model because this model has infrastructures that attract investors and create ease of doing business by tenant investors.

This section will elaborate in detail the operation philosophy of the plants belonging to the wastewater treatment system. The treatment plant shall have both automatic and manual operating mode. With this in mind, consulted designed this manual to show some of the common wastewater treatment plant operation and maintenance procedures.

To this end, the main operational procedures are:

**Procedure-1:- Enhance organizational capabilities of the plant.** This procedure intends to;

- ❖ Define clearly the plant work process and prepare organogram (flow diagram).
- ❖ Redefine job description of all positions (phase wise operation)
- ❖ Coach and mentor staffs to make them mentally ready and confident for operation
- ❖ Avail units specific training modules
- ❖ Avail all the necessary working documents
- ❖ Prepare and deliver detailed plant specific operation procedures (such as O&M SOP)
- ❖ Conduct practical and theoretical trainings through intensive and continues on job training by
  - Technological knowledgeable specialists/experts
  - Peer-learning session among local staffs
  - Development partners
  - Government agencies (like water technology institute, TVET and universities)
  - Competent Consultants
- ❖ Establish strong M & E system to measures performance of local staffs
- ❖ Establish standardized template for monitoring and reporting

**Procedure -2:- Ensure sustainable supply of chemicals, reagents and consumables.**

This procedure intends to;

- ❖ Conduct deep market assessment of local importers capacity to substitute
- ❖ Identify local producer/supplier of chemicals, reagents, and consumables for the plant to reduce list of import items.
- ❖ Construct adequate and safe storage, which carries chemical stock at least for 6 months.

**Procedure-3:- Ensure Supply of Spare Parts and Consumables.** This procedure intends to;

- ❖ Conduct deep market assessment of local importers capacity to substitute
- ❖ Identify local producer/supplier of spare parts and consumables for the plant to reduce list of import items.
- ❖ Construct spare parts/consumables storage

**Procedure -4: Develop In-House Capacity of Maintenance Services.** This procedure intends to;

- ❖ Prepare and avail detail maintenance procedures, protocol and manual (such as SOP)
- ❖ Conduct on job capacity building trainings on maintenance.
- ❖ Identify maintenance service, which can be managed internally or outsourced.
- ❖ Establish well-organized and complete electro-mechanical maintenance workshop.
- ❖ Sign service level agreement for maintenance services that cannot be operated in-house
- ❖ In some cases, due to the nature of the plant process operation, RIPDC management in case of failure of normal procurement should decide procurement of spare parts from specific supplier/producer.

**Procedure-5: Establish Property Management System.** This procedure intends to;

- ❖ Develop store record and inventory management system for of chemicals, reagents, spare parts and consumables.
- ❖ Establish plant specific technical committee for approval of the procurement and management of goods and services.
- ❖ Conduct asset inventory.

**Procedure -6:- Ensure Financial Sustainability of the Plant.** This procedure intends to;

- ❖ set WWTP fees with the engagement of tenants
- ❖ Apply energy efficiency intervention measures
- ❖ Apply chemical optimization
- ❖ Secure subsidy finance from the government and other development partners
- ❖ Setting tariffs for recycled water and negotiate with investors
- ❖ Introduce pollution load treatment fees such as COD, TDS, color, etc. in addition to volume discharged.

**Procedure-7: Establish Monitoring and Controlling System for Upstream Wastewater Discharges.** This procedure intends to;

- ❖ Each of the tenant must install coarse and fine screen at the outlet of sewer to prevent bigger debris coming to the plant.
- ❖ Each tenant must construct temporary holding tanks with the capacity of holding wastewater for 72 hours.
- ❖ Install flow meter and conduct accurate measurement of industrial wastewater.
- ❖ Monitor and collect regular data and information about the type of chemicals used for different production processes.
- ❖ Establish strong monitoring and supervision system
- ❖ Develop and implement wastewater management code of conduct for tenants and take correction measures accordingly.

**Procedure -8: Establish Sludge Management System.** This procedure intends to;

- ❖ Implement cost effective Alternative sludge drying technologies such as solar drying system or natural drying bed.
- ❖ Construct standardized dried sludge storage
- ❖ Improve sludge reuse options like energy and composting
- ❖ Work in collaboration with stakeholders

**Procedure -9: Setting Quality Control Laboratory.** This procedure intends to;

- Collect representative samples at inlet and out let
- Conduct jar test
- Conduct plant performance test
  - pH
  - Total suspended solid (TSS)
  - Total dissolve solid (TDS)
  - Biochemical Oxygen Demand (BOD)
  - Chemical Oxygen Demand (COD)
  - Oil and Grease
  - Total coliform
  - Ammonia (NH<sub>3</sub>)
  - Total Nitrogen (TN)
  - Total Phosphorus (TP)
  - Detergent
- Compare treated wastewater quality with relevant standards
  - Discharge to WWTP-inlet parameters
  - Discharge to environment-
  - Reuse applications
  - Wetland or land application

**Procedure -10: Keep Log Sheets.** This procedure intends to;

- Keep updated Maintenance log sheets records
- Keep Operation log sheet records
- Keep all safety requirements records
- Keep plant troubleshooting and plant shut down schedules
- Keep any violations by tenants



## 5. MONITORING AND EVALUATION (KPI)

*Monitoring*-wastewater and water quality monitoring program with adequate resources and management oversight should be developed and implemented to meet the objective(s) of the monitoring program. The wastewater and water quality-monitoring program should consider the following elements;

- ✓ *Monitoring parameters*: The parameters selected for monitoring should be indicative of the pollutants of concern from the process and should include parameters that are regulated under compliance requirements (see annexes);
- ✓ *Monitoring type and frequency*: Wastewater monitoring should take into consideration the discharge characteristics from the process over time. Wastewaters from highly variable processes may need taking samples more frequently or through composite methods. Grab samples or, if automated equipment permits, composite samples may offer more insight on average concentrations of pollutants over a 24-hour period. Composite samplers may not be appropriate where analyses of concern are short-lived (e.g., quickly degraded or volatile).
- ✓ *Monitoring locations*: The monitoring location should be selected with the objective of providing representative monitoring data. Wastewater sampling stations may be located at the final discharge as well as at strategic upstream points prior to merging of different discharges. Process discharges should not be diluted prior or after treatment with the objective of meeting the discharge or ambient water quality standards.
- ✓ *Data quality*: Monitoring programs should apply internationally approved methods for sample collection, preservation and analysis. Sampling should be conducted by or under the supervision of trained individuals. Analysis should be conducted by entities permitted or certified for this purpose.
- ✓ Environmental Records shall be kept and use for planning and learning

## 6. COST RECOVERY STRATEGY

Cost recovery in wastewater treatment is indeed very context-specific. However, from review of a number of international practices regarding wastewater treatment plants, the Consultant recommended for liquid waste management by IAIP/RTC operations:

### **A. Consider the most significant pollution load parameters that drive treatment cost**

Most developing countries do not look in detail at the different levels of pollution of wastewater as a base for wastewater treatment tariff setting for industries. Pre-treatment at individual companies is a solution in this context as it will ensure a homogenous wastewater for further treatment at the central treatment units.

However, in case the diverse wastewater as will be the case if there are different industries with no pre-treatment, there might be space for basing the treatment tariff on the most significant pollution load parameter (e.g. COD), which drives the common wastewater treatment operational cost.

### **B. Enforce regulated standards and charge cost-covering discharge fees**

It is important to base the treatment tariff on the pollution load or hydraulic volume parameter which drive the treatment cost so that the polluter does pay for the pollution it causes. In addition, such a treatment tariff should be set at such a level that it can recover the (full) cost of treatment so that treatment operations are financially sustainable.

### **C. Recover and sell treated wastewater and additional materials back to industries**

Valuable resources should be re-used to improve cost recovery. Therefore, operation and maintenance cost can be calculated as follows:

Formula

$$TC = K + (COD_i/COD_m) * h + (SS_i/SS_m) * z + [(COD_i * 0.6 + SS_i)] * SC$$

Where;

TC= total cost of treatment plant

K- (Investment and depreciation cost per month for 20 years service time of CETP) =

- Fixed costs (IL/m<sup>3</sup>), formula = (Annual fixed costs (IL): total volume of treated wastewater (m<sup>3</sup>/year)

COD<sub>i</sub>-

- COD of plant wastewater determined by sampling and analysis or assumed for the specific activity class

COD<sub>m</sub>-

- Average COD of the raw mixed wastewater analyzed at the CETP inlet
- h- (chemical, maintenance, labor, energy, rehabilitation, admin, penalties (if))
- COD removal costs, formula = [Annual variable costs (IL): total volume of treated wastewater (m<sup>3</sup>/year)] x 0.75

SS<sub>i</sub>-

- SS of plant wastewater determined by sampling and analysis or assumed for the specific activity class

SSm-

- Average SS of the raw mixed wastewater analyzed at the CETP inlet z- ()
- SS removal costs, formula = [Annual variable costs (IL): total volume of treated wastewater (m<sup>3</sup>/year)] x 0.25.  
SC- (transport and disposal)
- Sludge disposal cost, formula = COD<sub>i</sub> x SS<sub>i</sub> x (average sludge disposal cost (IL/kg): Total kg of SS and COD treated by the plant in the year)

The basis for pricing shall include the following income revenue and expenses.

S.No	Expense stream	
1.	chemicals	
2.	consumables	
3.	maintenance	
4.	sludge disposal	
5.	energy	
6.	staff	
7.	admin (OT, Milk, Safety materials and transport)	

Revenue stream = Treated wastewater reuse tariff
--

## ANNEXES

### Annex 1 treated wastewater discharge and reuse limit values

S.No	Parameters	Industry specific discharge limit					STP discharge limit IFC, 2007	water reuse requirements WHO and FAO (food crop irrigation, toilet flushing and industrial except food processing)
		Malting, brewing, distilling, production of wines and other alcoholic liquors	Dairy products	Fruit and vegetable processing	Slaughtering meat processing and rendering	IFC Wastewater levels for food and beverage processing		
1	Temperature in °C	40	40	40	40	40	40	25
2	pH	6 – 9	6--9	6--9	6--9	6--9	6--9	7--8
3	BOD5 in mg/l	60	60	60	80	50	30	10
4	COD in mg/l	250	250	250	250	250	125	100
5	Suspended solids in mg/l	50	50	50	80	50	50	10
6	Total ammonia (as N) in mg/l	20	15	20	20			5
7	Total nitrogen (as N) in mg/l	40	40	40	40	10	10	5
8	Total phosphorus (as P) in mg/l	5	5	5	5	2	2	1
9	Oils, fats, and grease in mg/l	15	15	15	15		10	2
10	Mineral oils at the oil trap or interceptor in mg/l	20	20	20	20			5
11	Total coliform bacteria (number per 100ml) in mg/l				400	400	400	0
12	Active Ingredients / Antibiotics to be decided base on the current facts in mg/l							0
13	Helminthes					0		0
14	TDS in mg/l							350
15	Heavy metals in mg/l							trace

## Annex 2: pollution load design parameters for agro-industry combined wastewater treatment plants

S.No	Parameters	Blended industrial for inlet parameter	STP inlet	Blended inlet for central WWTP inlet
1	Temperature in °C	40	23	31.5
2	pH	5	6.5	5.75
3	BOD5 in mg/l	620	300	460
4	COD in mg/l	2500	1250	1875
5	Suspended solids in mg/l	560	500	530
6	Total ammonia (as N) in mg/l	150	0	75
7	Total nitrogen (as N) in mg/l	340	100	220
8	Total phosphorus (as P) in mg/l	44	20	32
9	Oils, fats, and grease in mg/l	120	100	110
10	Mineral oils at the oil trap or interceptor in mg/l	160	0	80
11	Total coliform bacteria (number per 100ml) in mg/l	16000	4000	10000
12	Active Ingredients /Antibiotics to be decided base on the current facts	0	0	0
13	Helminthes		10	5
14	TDS in mg/l	2800	750	1775
15	Heavy metalsin mg/l		1	0.5

\*\*\*\*Note: blended inlet is the discharge standard for individual investors. To fulfill the inlet parameters, individual investor shall install 3-stage screening, flow meter and pre-treatments based on the nature of their waste (refer table 5.1).

## Annex 3: volumetric design parameters of water and wastewater (PLANT CAPACITIES)

S.No	Name of the Integrated Agro Industry Park/RTC	Water consumption in m <sup>3</sup> /day	Type of treatment technology to treat potable water	Wastewater discharge amount m <sup>3</sup> /day	Type of technology to treat wastewater
1.	Yirgalem IAIP				
1.1.	----- RTC				
1.2.	----- RTC				
1.3.	----- RTC				
1.4.	----- RTC				
1.5.	----- RTC				
1.6.	----- RTC				
1.7.	----- RTC				
2.	Bulbula IAIP				
2.1.	----- RTC				
2.2.	----- RTC				
2.3.	----- RTC				
2.4.	----- RTC				
2.5.	----- RTC				

S.No	Name of the Integrated Agro Industry Park/RTC	Water consumption in m <sup>3</sup> /day	Type of treatment technology to treat potable water	Wastewater discharge amount m <sup>3</sup> /day	Type of technology to treat wastewater
2.6.	----- RTC				
2.7.	----- RTC				
2.8.	----- RTC				
2.9.	----- RTC				
0.	----- RTC				
3.	Bure IAIP				
3.1.	----- RTC				
3.2.	----- RTC				
3.3.	----- RTC				
3.4.	----- RTC				
3.5.	----- RTC				
3.6.	----- RTC				

#### Annex 4: Treatment methods for each parameters

Parameters	Control Options / Principle	Common End of Pipe Control Technology
pH	Chemical, Equalization	Acid/Base addition, Flow equalization
Oil and Grease / TPH	Phase separation	Dissolved Air Floatation, oil water separator, grease trap
TSS - Settle able	Settling, Size Exclusion	Sedimentation basin, clarifier, centrifuge, screens
TSS - Non-Settle able	Floatation, Filtration - traditional and tangential	Dissolved air floatation, Multimedia filter, sand filter, fabric filter, ultrafiltration, microfiltration
Hi - BOD (> 2 Kg/m <sup>3</sup> )	Biological - Anaerobic	Suspended growth, attached growth, hybrid
Lo - BOD (< 2 Kg/m <sup>3</sup> )	Biological - Aerobic, Facultative	Suspended growth, attached growth, hybrid
COD - Non-Biodegradable	Oxidation, Adsorption, Size Exclusion	Chemical oxidation, Thermal oxidation, Activated Carbon, Membranes
Metals - Particulate and Soluble	Coagulation, flocculation, precipitation, size exclusion	Flash mix with settling, filtration - traditional and tangential
Inorganics / Non-metals	Coagulation, flocculation, precipitation, size exclusion, Oxidation, Adsorption	Flash mix with settling, filtration - traditional and tangential, Chemical oxidation, Thermal oxidation, Activated Carbon, Reverse Osmosis, Evaporation
Organics - VOCs and SVOCs	Biological - Aerobic, Anaerobic, Facultative; Adsorption, Oxidation	Biological : Suspended growth, attached growth, hybrid; Chemical oxidation, Thermal oxidation, Activated Carbon
Emissions – Odors and VOCs	Capture – Active or Passive; Biological; Adsorption, Oxidation	Biological : Attached growth; Chemical oxidation, Thermal oxidation, Activated Carbon
Nutrients	Biological Nutrient Removal, Chemical, Physical, Adsorption	Aerobic/Anoxic biological treatment, chemical hydrolysis and air stripping, chlorination, ion exchange
Color	Biological - Aerobic, Anaerobic, Facultative; Adsorption, Oxidation	Biological Aerobic, Chemical oxidation, Activated Carbon
Temperature	Evaporative Cooling	Surface Aerators, Flow Equalization

Parameters	Control Options / Principle	Common End of Pipe Control Technology
TDS	Concentration, Size Exclusion	Evaporation, crystallization, Reverse Osmosis
Active Ingredients/Emerging Contaminants	Adsorption, Oxidation, Size Exclusion, Concentration	Chemical oxidation, Thermal oxidation, Activated Carbon, Ion Exchange, Reverse Osmosis, Evaporation, Crystallization
Radionuclides	Adsorption, Size Exclusion, Concentration	Ion Exchange, Reverse Osmosis, Evaporation, Crystallization
Pathogens	Disinfection, Sterilization	Chlorine, Ozone, Peroxide, UV, Thermal
Toxicity	Adsorption, Oxidation, Size Exclusion, Concentration	Chemical oxidation, Thermal oxidation, Activated Carbon, Evaporation, crystallization, Reverse Osmosis

## Annex 5: Advanced conventional wastewater treatment plants operational process

Since the type of industries are different by their sector, the nature of the wastewater composition is also various. Therefore, advanced conventional wastewater technologies are proposed for IAIP/RTC.

At IAIP level, one or more treatment process can be implemented by tenant investors to meet the discharge standards.

### 1. Pre-treatment

#### A. Coarse Screen Chamber:

The raw wastewater is screened for removal of all debris which is 10 mm and above sizes inadvertently flows along with the wastewater before Oil & Grease Trap and Equalisation Tank.

#### B. Grit Chamber cum Partial Flume:

The Grits (if any) are allowed to be accumulated in the Grit chamber / channel and passes through the Partial flume to measure and reduce the Flow. At this stage sand will be stele down so that it shall be cleaned at least per day.

#### C. Fine Screen

The smallest particles and sand is screened by two stage fine screen. If this stage is inefficient, the treatment plant is at risk, so timely monitoring and cleaning is mandatory.

#### D. Flow Measurement

All water and wastewater treatment shall be measured before any operation

#### E. Holding Tank

All tenant investors shall build at least 24 hours holding tank. This can also have some advanced pre-treatment options based on tenants' discharge requirements.

#### F. Sampling Locations

Since payment is expected, it should be based on both volume and pollution load.

## **2. Primary Treatment**

### **A. Equalization Tank:**

The waste water from all the industries is collected in this Tank which is provided with *Coarse Bubble Aeration* system to equalize and reduce temperature for the concentration such as BOD, PH, COD& TSS before taken for further treatment units.

### **B. Flash Mixing and Flocculation:**

PH adjustments and flocculant is Flash Mixed with the Equalized wastewater and then flocculated with Polyelectrolyte before taken into the Primary Clarifier. The Coagulants help in making the suspended solids to agglomerate into bigger floc particle which settles faster.

### **C. Primary Clarifier:**

Primary Clarification removes by means of settling /suspending excess suspended solids and sludge generated after degradation of the impurities. The Sludge is scrapped with the help of Scrapper Mechanism and withdrawn with the help of Primary Sludge Pump in to the Sludge collection Tank.

The supernatant is allowed to overflow to the Aeration tank for further biodegradation under aerobic condition.

## **3. Secondary Treatment**

### **A. Biological Treatment:**

The wastewater after primary treatment is subjected to secondary treatment. There is various processes of Biological Treatments among others Activated Sludge Process is one, anoxic, aerobic and anaerobic process are the others. The major goal of this treatment is to remove soluble Pollutants, Nitrogen and Phosphorous by oxidation and biological entities. This involves bringing the active microbes in contact with waste water which consume the Organic matters as food. Again, during this process Microbes use some Inorganic and Metallic compounds for their growth. These organisms; in presence of Oxygen ( O<sub>2</sub> ), convert the biodegradable organics into Carbon Dioxide ( CO<sub>2</sub> ), Water, Nitrogen and more cell material and other inert products.

High-speed aerating devices are fixed at the bottom of the aeration tank, which blows air through the waste at a rate about ----- m<sup>3</sup> per hour. Here the non-settleable and bio-degradable organics present in the wastewater are treated bio-chemically. This process is utilized to convert non-settleable, bio-degradable matters dissolved and colloidal solids into settleable sludge. System is designed to maintain high MLSS and Low F/M ratio. The aeration system in the Aeration Tank / Bio-Reactor is carried through Fine bubble Membrane diffused aeration system.

### **B. Secondary Clarifier:**

The wastewater along with Bio-Mass from Aeration Tank /Bio-Reactor overflows by gravity to Secondary Clarifier. Active biomass get settle at the bottom of tank. Part of the active biomass is recycled back to Aeration Tank / Bio-reactor with the help of RAS (return Activated Sludge) Pump to maintain required population of bacteria (MLSS) and excess biomass is sent to sludge collection Sump.



The Biological Sludge is scrapped with the help of Scrapper Mechanism and is pumped to the Sludge Tank.

#### **4. Tertiary Treatment**

The water from the secondary treatment is then collected in Filter Feed Tank and it is once again pumped through Pressure *Sand Filter* (PSF) and *Activated Carbon Filter* (ACF). The Pressure Sand Filter employed with quartz sand media and down-flow system during filtration. It is designed to reduce the suspended solids and TDS present in the supernatant in Micronics size. In a cycle of 12 hrs, both PSF and ACF are back washed to avoid clogging and to have quality filtration.

The Activated Carbon Filter Filled with Activated Carbon and down-flow system during filtration. It is designed to reduce the Soluble Organic Compound and Traces of Heavy metals if any present in the water. In a cycle of 12 hrs, the ACF is back washed to avoid clogging and to have quality filtration.

#### **5. Supplementary Treatment**

##### **A. Chlorination**

The wastewater from the Secondary clarifier is passed through the Chlorine contact through pipeline / zone Baffled type before allowed for Filtration. Liquid chlorination (NaOCl) is adopted from safety point.

Prior to pumping into the Filters Chlorination is adopted to kill the bacteria so as to avoid the growth of bacteria inside the Filters as well as further contamination in the downstream.

##### **B. Sludge**

*Sludge* collected from the Primary Clarifier and Secondary Clarifier in the Sludge Tank is further pumped through the Filter Press to dewater and form the sludge cake. The sludge cake is further put into the Sludge Drying Bed to reduce the weight. Then after digesting for energy generation and bio fertilizer production are recommended.

##### **C. Treated Water Reuse Options**

IAIP treated wastewater reuse shall be functional



PRO  
SEAD



# Landscape and Greenery Development and Management Operational Manual



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## LIST OF ABBREVIATIONS AND ACRONYMS

<b>EFCCC</b>	Environment Forest and Climate change Commission
<b>IAIP</b>	Integrated Agro Industry Park
<b>MoUDH</b>	Ministry of Urban Development and Housing
<b>RIPDC</b>	Regional Industrial Parks Development Corporations
<b>RTCs</b>	Rural Transformation Centers

## DEFINITION OF TERMS

**Landscape** is the use of plants outdoors to fulfill aesthetic and functional purposes is not a modern man's invention or landscaping is an activity in which beauty, as well as function, may be determined by the customer.

**Natural landscape** is a natural landscape that is unaffected by human activity

**Soft cape (greenery)** refers to the elements of a landscape that comprise live, horticultural elements

**Functional Landscape:** Sustainable landscape needs to be functional. A functional landscape allows for the easy accomplishment of movement, work and recreation that occur in and around the landscape.

**Maintainable Landscape:** A sustainable landscape design lowers labor cost and makes maintenance operations easier. A maintainable landscape also reduces the need for inputs such as fertilizer, pesticides, equipment, water and other things. It reduces inputs; but not eliminate it.

**Environmentally Sound Landscape:** is a land scape designed to be functional and maintainable. Proper design of plants and related landscapes are very important. "Right plant on the right place" and "right plant for the right purpose are an important consideration.

**Cost effective landscape:** A simple low-cost landscape should be as sustainable as an extensive high cost landscape. The ongoing maintenance costs of a functional, maintainable, and environmentally sound landscape will be lower.

**Visually pleasing landscape:** A visually pleasing landscape is what we all strive (attempt) for. Designing a sustainable landscape requires the irrigation of more variable. Functionality, maintainability, environmental soundness and cost effectiveness provide the framework needed to create a visually pleasing landscape.

# 1. INTRODUCTION

landscape and greenery development work cover leveling the ground, unnecessary soil cart away, soil characterization, plantation pit preparation, species selection, and soil conditioning with fertile red soil and composting activities.

## 1.1. Purpose and Scope of this Manual

---

This document helps to:

- ✓ create common understanding among stakeholders on commercial landscaping of IAIP/RTC
- ✓ have minimum standards of landscape development and management
- ✓ recommend the cost recovery mechanisms for landscape development
- ✓ provide a platform of evidence for all types of landscape and green area services
- ✓ Propose management model for sustained landscape and greenery development
- ✓ Create understanding on the unique contribution of landscape to IAIP/RTC

The scope of this manual covers both development and operation of landscape and greenery works in IAIP/RTCs

## 1.2. Updating Frequency and Procedure

---

This manual can be updated annually during management review of the IAIP/RTCs based on performance evaluation of landscape and greenery management service or when request is raised by user of the manual and approved by the management of IAIP/RTCs.

## 1.3. Principles of Landscaping and Greenery

---

### 1.3.1. Landscape

Landscape comprises the visible features of an area of land, including physical elements such as landforms, living elements of flora and fauna, abstract elements like lighting and weather conditions, and human elements like human activity and the built environment.

The Dutch word landscape had earlier meant simply 'region', tract of land but had acquired the artistic sense, which it brought over into English, of a picture depicting scenery on land.

### 1.3.2. Natural Landscape

Natural landscapes are landscapes beyond cultural influence. "A natural landscape is one that is unaffected by human activity. A natural landscape is intact when all living and nonliving elements are free to move and change. The nonliving elements distinguish a natural landscape from a wilderness. A wilderness includes areas within which natural processes operate without human interference, but a wilderness must contain life. As implied, a natural landscape may contain wither the living or non-living or both.

### 1.3.3. Softscape (greenery)

Softscape refers to the elements of a landscape that comprise live, horticultural elements. Softscape can include; flower, plants, shrubs, trees, flowerbeds etc. The purpose of softscape

is to lend character to the landscaping, create an aura, ambience, and reflect the sensibilities of the inhabitants.

The term softscape stands in contrast to hardscape, which represents inanimate objects of a landscape such as pavers, stones, rocks, etc.

#### **1.3.4. Principles of Landscaping**

Using plants outdoors is not a modern-day invention. Sometimes plants are used alone at other times they are used in conjugation with none plant elements (e.g. Walkways, fountains etc). The key goals of landscaping design may be summed up into two:

- Function
- Aesthetic

#### **1.3.5. Purpose of Landscape**

In fulfilling aesthetic and functional purposes, landscaping may be specially used to accomplish the following:

- Enhance the aesthetic appeal of the area- home and business environments.
- Increase property value.
- Blend concrete and architectural creation into the natural scenery.
- Control vehicular and pedestrian traffic- pavements indicate where people should walk, trees, flowerbeds, and other features can be used to discourage people from making undesirable shortcuts across lawns.
- Modify environmental factors- trees serve as wind break, modify temperature, provide shade
- Create recreational grounds to provide places for relaxation and community interaction
- Provide hobby activities for business owners- people can care for their garden, water plants
- Improve and conserve natural resources by reducing soil erosion
- Provide therapeutic relief- enjoying the landscape can be relaxing

#### **1.3.6. Categories of Landscape**

In terms of customers, users, and their needs of preferences, landscaping may be grouped into four categories:

1. Residential landscaping
2. Public landscaping
3. Commercial landscaping
4. Specialty landscaping

Among these, commercial landscaping is applicable for IAIP/RTCs. In a way, commercial landscaping has a public element, since businesses are open to the public. Commercial places often have lots of space for parking. Commercial landscaping is found in places such as shopping malls, hotels, banks, industries and restaurants. Both high and low traffic areas exist on company premises. Some businesses display merchants in their windows and hence avoid obstructing the view in those areas.



## 2. REGULATIONS, NORMS AND STANDARDS

The main guidance documents for effective landscape and greenery development and management are:

- Urban green space manuals
- Industrial zone Open space management manuals
- IFC ecosystem service improvement
- ESIA impact mitigation measures
- Planation manuals

## 3. LANDSCAPE DESIGN CONSIDERATIONS

Landscape design is the art and processes of designing and creating plans for layout and planting of landscape. It could be done by either landscape owner or professionals.

Certain principles form the basis of effective landscape design. The layout of the landscape includes paths, walls, water features and sitting areas.

In landscaping works it is important to understand the horticultural requirement of plants. Some of plant characteristics to be considered are:

- Season to season appearance
- Life span, growth habit
- Size, speed of growth
- Combination with other plants and other landscape features
- Maintenance requirement

### 3.1. Landscape Design Considerations

---

#### 3.1.1. Location

The landscape location has substantial influence on the garden design. Wonderful landscape possesses a location that is topographically significant and has a suitable microclimate for plants. It has good quality soil because it influences the availability of water and nutrients. The availability of beneficial soil organisms and other important factors for plant growth need to be considered.

#### 3.1.2. Boundaries

The landscape is influenced by its boundary. Planting can be used to modify the boundary line. Hedges, being strong features in a garden, but not always recommended.

#### 3.1.3. Alternative Surfacing

Usually, a smooth expanse (area) of green area is often considered essential. A textured surface made up of loose gravel, small pebbles (gravel or stone), or wood chips is also considered essential. Creating a relaxed feel to a landscape is often done by mixing various textures, shapes, sizes, colors and materials of different types.

#### 3.1.4. Planting Design

Planting design required design judgment and good knowledge of horticulture, ecology and cultural knowledge. The two major planting designs are:

- Formal and
- Naturalistic planting designs

#### 3.1.5. Sunlight

Sunlight is important element of garden design. It determines what type of plants may be grown. Type and arrangement of light is so important in landscaping.

### **3.1.6. Lighting**

Type and arrangement of light is so important

### **3.1.7. Site Analysis**

It is a survey of a landscape project to ascertain presence, distribution and characteristics of its natural and manmade features.

## **3.2. Plants in the Landscape**

---

After allocation of walkways, driveways, private areas and utility areas, the next step is allocation of plants strategically.

### **3.3. Selection of Plants**

---

A number of factors determine the type of plants that can be planted.

#### **3.3.1. Climate**

The two important climate considerations are temperature and moisture. The species must be adapted to the local area with respect to critical elements. If the area is drier than others it needs supplementary irrigation and planning of drought resistant varieties or species the area required.

#### **3.3.2. Soil Reaction (Edaphic Factors)**

It includes soil acidity, soil alkalinity, soil fertility and soil texture, etc.

#### **3.3.3. Sunlight**

- The general amount of sunlight the garden receives is important in choosing plant species
- In open areas- sun-loving plants are planted
- In shaded areas- shade tolerant plants are planted

#### **3.3.4. Features of Maturity**

The location of plant depends on its size, shape, maturity, form and habit. Plants may be small at initial stages of growth and become tall trees after some time. Plants may grow fast, slow or have wide or narrow canopy.

#### **3.3.5. Maintenance Level**

Plants differ in the level of care they need to grow and produce the best results.

#### **3.3.6. Customer Preference**

Every effort should be made to satisfy the customer

#### **3.3.7. Sustainability and Landscape Design**

There are four considerations in designing a sustainable landscape. These are treating water as resource, valuing the soil, preservation of existing plants, and conserve material resources

## 4. MINIMUM REQUIREMENTS OF LANDSCAPE DEVELOPMENT

### 4.1. Buffer Area Requirements

---

Green areas should have minimum buffer requirement to the nearest things. These are to have a master plan of areas, excluding landscape.

### 4.2. Setting the Boundary

---

Permanent north, east, west and south points need to be in place at least for every regular or irregular plot and knowing the connection of whole areas and the proportion of activities to be executed

### 4.3. Site Delineation and Mapping

---

Landscape area should have the right of way ownership certificate, so that, one can develop, use and manage the landscape

### 4.4. Design Approval Process

---

Landscape design shall be functional, maintainable, environmental sound, cost effective and visually pleasing.

### 4.5. Site Preparation

---

- Clearing unnecessary things
- Soil and water conservation structures
- Soil and agro-ecology characterization
- Leveling the ground based on the design and plantation requirements
- Soil conditioning for shrubs and grass
- Plantation pit preparation with a minimum of 3 m distance for higher deciduous plant and line for purposeful plantation

### 4.6. Civil Works and Infrastructure Installation

---

- Water line installation
- Lightening installation
- Building walk ways
- Sittings
- Building curve stones
- Drainage system establishment
- Building water tank

### 4.7. Plantation Requirements

---

- Identify higher plant species specific to site
- Select shrubs which has beauty and environmental value
- Grass selection
- Seedling transportation
- Execute actual plantation

#### **4.8. Social and Environmental Safeguard Requirement**

---

- Initial environmental impact assessment report
- Water quality and supply analysis
- PPE for workers safety

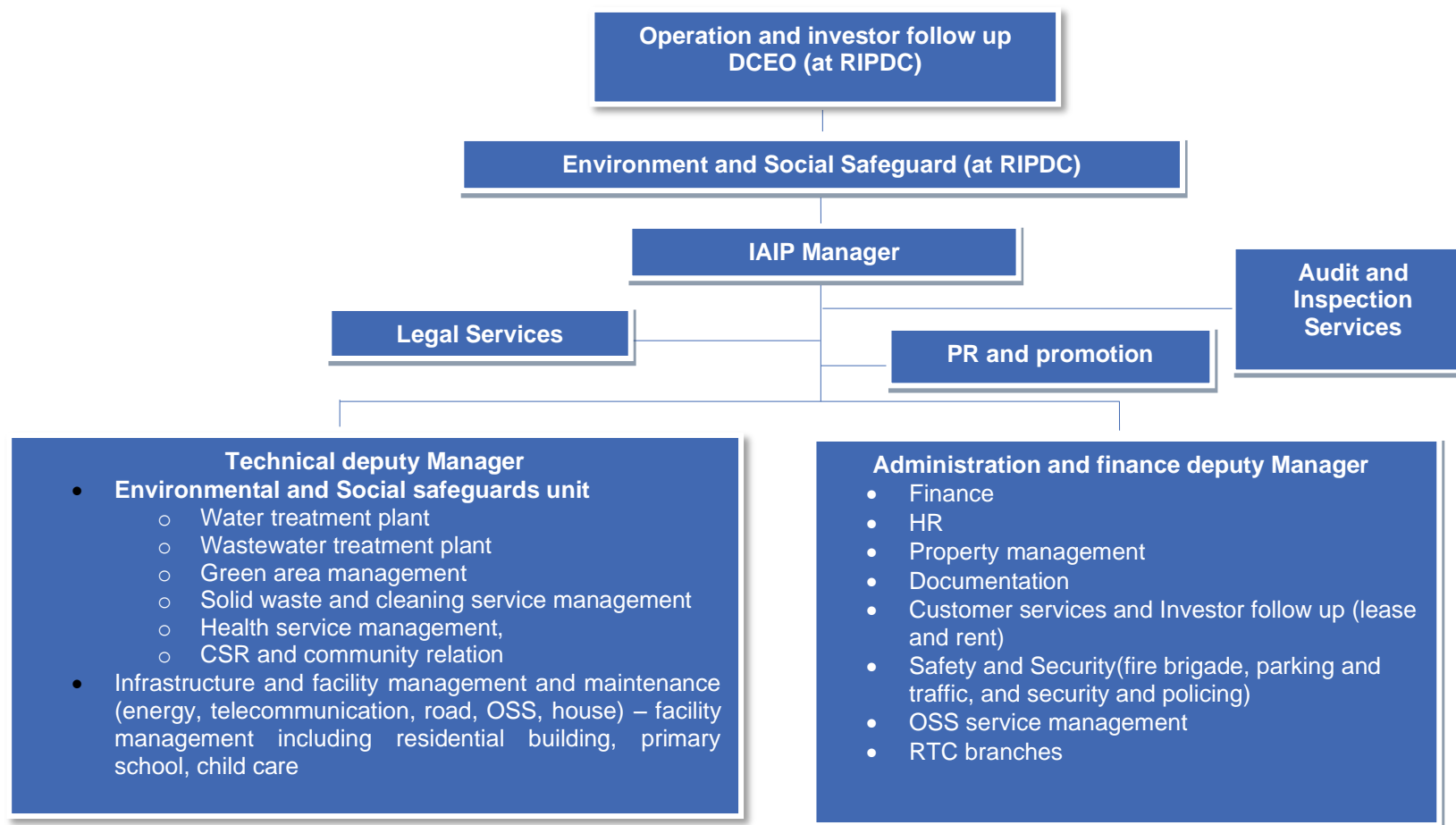
#### **4.9. Institutional Requirement (Can Be Fully Outsourced)**

---

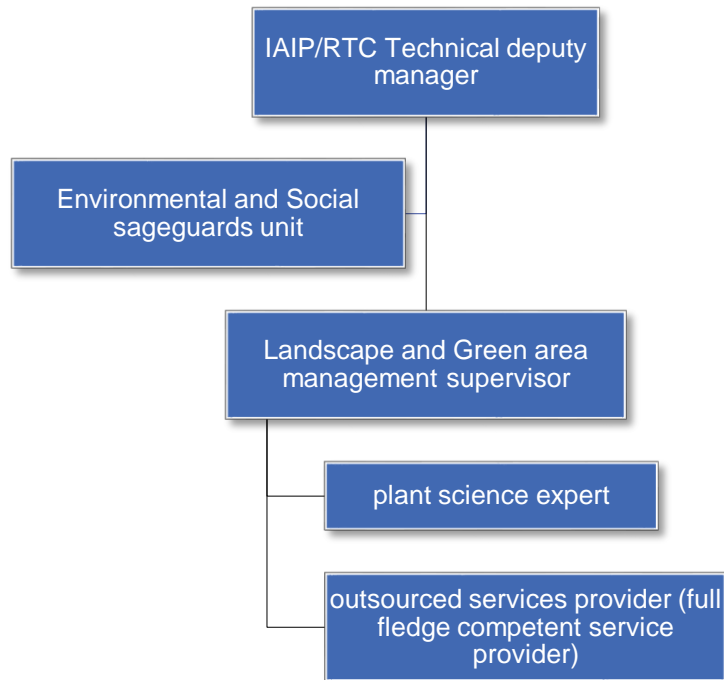
- 1 Offices
- 1 Store

The proposed organizational structure of the IAIP showing its relationship with the concerned unit of RIPDC is given in Figure 4.1 while the detailed organizational structure of liquid management is given in Figure 4.2.

**Figure 4.1: Proposed Organizational Structure of IAIP/RTC**



**Figure 4.2: Detailed Organizational Structure for Management of Greenery and Landscape**



#### 4.10. Reporting Structure

The greenery management system shall use the following reporting chain of command, mandatory to be respected by all the workers of the environmental and social safeguard unit which is under the technical deputy manager who in turn report to the manager of the park. All the workers of greenery and landscape management shall report to supervisor for greenery and landscape.

**Landscape and Green area management supervisor:** The role of the greenery supervisor is to coordinate both internal activities of landscape and greenery works and control of outsourced services.

**Plant science Expert:** The role of this expert is to follow up operation and maintenance tasks as per the standards. Technical approval for the work done is also expected from this expert. The main area of concerns is watering, composting, pruning and replanting.

**Outsourced services provider:** This team has the responsibility of operation and maintenance tasks of the landscape and greenery works as per the requirements of this manual.

#### 4.11. Working Inputs Requirement

- 4 labor per hectare
- Full greenery maintenance equipment

#### **4.12. Tree Calculation**

---

Required trees - 1 tree per 4 m<sup>2</sup>, Street trees – 10 m distance with aligned line on a unit plot

#### **4.13. Tenant Investors Obligation**

---

Street trees shall be placed within the tenants to Right-of-way, MoUDH standards for industry will be applied. Basically, setbacks shall remain for every fencing area. Street trees planted along private roadways shall be placed within minimum of 0.8m of the edge of roadway pavement and/or where present within 0.8 m of the sidewalk.

#### **4.14. Minimum Lawn Area Calculation**

---

The minimum green area requirement is 10% of the net industry area or 0.10 x IAIP/RTC area= Minimum green area per IAIP/RTC.

#### **4.15. Shrub Requirement**

---

Shrub trees shall be placed within the grass area or shall be placed on edge of grass and or other as transition. Required shrubs = 10 shrubs per 1m

#### **4.16. Irrigation**

---

All newly planted and relocated plant material shall be watered by temporary or permanent irrigation systems until they are established and subsequently on need basis to prevent stress. Required water for IAIP/RTC grass= 6 litter per m<sup>2</sup>, shrubs = 5 litter per m<sup>2</sup> and higher trees = 4 litter per m<sup>2</sup> or four trees.



## 5. OPERATION AND MAINTENANCE STANDARD OPERATING PROCEDURES

- Prepare moving schedule and implement regularly
  - ✓ All grassed areas shall be maintained in a weed free state. Weed growth with grass areas must not exceed 10% of the total grass area.
  - ✓ Grass clippings shall be distributed evenly over the surface and at no time shall the layer of clippings be at such a depth that it will affect or damage the lawn area.
  - ✓ The maintenance service provider must not mow over any litter or debris. Prior to mowing, all areas shall be inspected and are to be cleared of litter and debris, including but not limited to paper, plastic, glass, rocks, branches, garden refuse, timber, spoil, etc. Such material shall be disposed of off-site at the service provider's expense. The service provider must take an environmentally responsible approach to the collection, sorting and recycling (where appropriate) of materials collected in the interests of waste minimization. Green waste recycling is encouraged.
  - ✓ Sharps are to be collected by the service provider and disposed of appropriately. The service provider should be fully aware of the associated problems of needle stick injury and therefore handle sharps accordingly.
  - ✓ Grass height shall be kept between 40 mm – 70mm in height.
  - ✓ All turf is to be cut evenly and sharply across the surface to a height of 40mm. The method of measurement of the mowing height shall be the average height from the ground to the uppermost extent of the blades when held up vertically. No more than one-third (1/3) of the grass length should be removed in any one mowing.
  - ✓ Wherever possible grass shall be cut in parallel lines so that all grassed areas are left with a neat and tidy appearance. On successive cuts the grass must be mowed in the opposite direction or at variable directions, particularly sports fields, to avoid windrows developing and to prevent grass seed stalks lying in one direction and remaining uncut.
  - ✓ After mowing, all hard surfaces such as footpaths and roads shall be cleared of cut material.
  - ✓ The needs of the public using parks facilities must be considered before mowing commences. At all times, the service provider must be courteous and respectful of the needs of these users.
  - ✓ All nature strips abutting reserves or managed facilities shall be mown and maintained to the same standard as the reserves or facilities.
  - ✓ The service provider should use discretion in the selection of appropriate machinery suited to the task and must take into consideration ambient site conditions. Ground surface damage as a result of the use of machinery inappropriate to the conditions will be the responsibility of the service provider to reinstate.
  - ✓ The service provider shall provide additional resources to accommodate peak growth periods to ensure that intervention levels are never exceeded.
- Prepare Trimming Schedule
- Properly trimming of trees, shrubs/flowers and grass
  - ✓ Removing dead branches, removing crowded limbs,
  - ✓ Removing hazards that could cause damage to people or property.
  - ✓ Carefully removing tree branches that have blocked light from getting to the ground so as to help other landscaping plants grow properly.

- ✓ Grassed surrounds of trees with a trunk diameter greater than 150mm measured at a point 300mm above the ground level, poles, posts, seats, fences buildings, etc., shall be maintained by mechanical means only (herbicide is not to be used in these situations).
- ✓ Cord line trimmers or sickles shall only be used around trees with trunk diameter greater than 150mm, measured at a point 300mm above ground level. Bark must not be damaged by trimmer cord. Control of grass growth around the base of trees less than 150mm trunk diameter could be with an appropriate non-residual herbicide if agreed by IAIP/RTC. Otherwise, mechanical methods will be used instead.
- ✓ If used at all, Cord trimming must not cause scalping around fixed objects and edges such as paths, kerbs, timber edge strips, etc
- Prepare pruning Schedule
- to encourage healthy growth, prune (cutting away) dead or overgrown branches or stems
- proper watering as it was indicated in the manual
  - ✓ Thoroughly soak the soil every two to three weeks during dry periods.
  - ✓ It is essential to first check the soil if it is moist by digging 4-6 inches into the ground and feeling the soil. A dry feel would indicate the need for watering.
  - ✓ Newly planted plants need regular watering for the first few years
  - ✓ It is important to get the water where the plant roots can absorb it.
  - ✓ Water slowly, so that it soaks the soil rather than run-off the surface. Popular methods of watering include: Sprinkling- useful in watering a large area particularly for watering ground covers. Less Water is lost through evaporation when sprinkler is used. Soaker hoses – rubber soaker hoses that ooze water slowly. They can be placed under the mulch.
- plan and implement maintenance schedule
- plan and implement proper fertigation (like add compost regularly)
  - ✓ Use the minimum recommended: When using fertilizers, remember that more is definitely not better! Be sure to read and exactly follow safety and application instructions on labels. Improper application, especially overuse, can be unsafe, increase contamination of storm water runoff, and damage plant tissue.
  - ✓ Distribute evenly: The use of uniform spreaders to ensure a more equal distribution of fertilizers is recommended.
  - ✓ Stay away from boundaries: Always leave a “Ring of Responsibility” around or along the shore ways of canals, lakes, or waterways. This avoids fertilizing too close to a body of water. Similar practices should be followed for sidewalks and roadways. Install deflector shields on fertilizer spreaders to prevent the fertilizer from landing in the water.
  - ✓ Time application appropriately: Fertilizers should be applied during the times of year when plants will be able to uptake the available nutrients with sufficient moisture.
  - ✓ Consider exclusively using organic fertilizers from composting units
- Capture run-off for reuse
- Prepare site specific plan and Implement Integrated Pest Management (weed and pest control)
  - ✓ **Cultural weed control- like mulching**

- ✓ Mechanical weed control – Mechanical control of common weed plants can be accomplished through hand pulling, hoeing, digging or mowing (which slows growth and reduces seed formation).
- ✓ Chemical weed control – Since many weeds can become aggressive to the point of taking over, chemical control is sometimes necessary, and used normally as a last resort.
- Maintain record keeping
- conduct regular hardscape maintenances
- collect all wastes regularly

## 6. LANDSCAPE AND GREENERY COST RECOVERY MECHANISMS

The majority of funds for a commercial landscape greening program need to come from investors at IAIP/RTCs. IAIP/RTCs need to find ways of securing general tax revenues or encouraging private investment to fund tree plantation programs, maintenance and protection or management of the landscape. It may also be possible to create special taxes, bonds and fees for green improvements that target specific groups such as developers or businesses.

Even with budgeted maintenance costs, it is more than likely that the public sector will not be able to shoulder all of the funding for a greening program. The first challenge then, is for the project office of RIPDC to identify potential external funding sources. Depending on the means available, these groups can provide direct financial contributions, payment in kind (e.g. trees and tools), or volunteer labor for planting, maintenance, and monitoring of green area using their guards nearest to each shed. Basically, greenery works expense can be recovered as ecosystem services fees.

## 7. ECOSYSTEM SERVICES MANAGEMENT

Generally, green and landscape area has social, environmental and economic values. The benefit offered from green area is called ecosystem services. Pleasant environment can give services for the social wellbeing while increasing economic returns. Therefore, landscape and green area can be used as sources of income from tourism and entertainment services. The operational procedure to provide such services are:

- ✓ Arrange dedicated area to be visited by customers
- ✓ Plan visiting time
- ✓ Orient safety precaution for any customers before they are going to enter
- ✓ Prepare diversified services payment pricing based on the number of areas to be visited
- ✓ Conduct inspection based on visiting protocol

# ANNEXES

## Annex 1: Landscaping MoU between the developer and owner

---

I, \_\_\_\_\_, declare as follows:

1. (circle either a or b)
  - a) I am the owner or authorized agent of the owner of the property, or
  - b) I am the landscape developer, defined in green area development for IAIP/RTC contract agreement, responsible for the approved landscape plan for the property located at
2. This property has been developed pursuant to: the contract agreement Number \_\_\_\_\_
3. The landscaping shown on the approved landscaping plan for this property has been installed in conformance with the approved landscape plan as documented on sustainable landscape development and management operational manual, which is incorporated into this binding MoU.
4. I understand that changes to any of the following aspects of the approved landscape plan require a Revision to the plans and approval by the Department of Environment in RIPDC:
  - a) Minimum number of trees or shrubs.
  - b) Location of required plantings or planting area
  - c) Substitution of species required by permit conditions to mitigate environmental impacts
  - d) Changes to the installation such that it would no longer comply with the operational manual.
5. A Street Use Permit has been obtained from the RIPDC for any required street trees, and these trees have been planted according to EFCC guidance.
6. Where the operational manual applies, a completed Landscape Maintenance Plan has been submitted to do so.

**I declare under my knowledge, including the sustainable landscape development and management operational manual attached is true and correct.**

Dated \_\_\_\_\_, 20\_\_\_\_ at \_\_\_\_\_

Signature of owner or authorized agent(or)

\_\_\_\_\_  
Signature of landscape developer

---



# Health and Safety Management



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## LIST OF ABBREVIATION AND ACRONYMS

**ACM-** Asbestos Containing Materials  
**BoLSA-** Bureau of Labor and Social Affairs  
**GFI-** Ground Fault Interrupter  
**HEPA-** High Efficiency Particulate Air  
**IAIP-** Integrated Agro Industry Park  
**ICSC-** Chemical Safety Cards  
**ILO-** International Labor Organization  
**IR-** Infra Red  
**MoLSA-** Ministry of Labor and Social Affairs  
**MSDS-** Materials Safety Data Sheets  
**OSS-** One Stop Shop Services  
**POPs-** Persistent Organic Pollutants  
**PPE-** Personal Protective Equipment  
**RIPDC-** Regional Industrial Parks Development Corporation  
**RTCs-** Rural Transformation Centers  
**UV-** Ultra Violet

## DEFINITION

**OHS Policy** is a signed statement by a senior person in the company, dated, and placed in a prominent location so that people in the workplace can see it

**Consultation and communication** are part of all Managers duties to review the OHS Implementation Plan, OHS POLICY, and procedures on a regular basis to ensure that they are being adhered to and that they comply with legislative requirements. It can be auditable if Safety Meeting Minutes are in place.

**Incident reporting and investigation** is an unplanned event that has resulted in, or has the potential to result in injury, illness, damage or loss. The term 'incident' includes accidents and near hits.

**First aid treatment** is initial and immediate attention to a person suffering an injury or illness. Requirements for first aid kits and facilities are set out in WHO guideline and Ethiopian OSH legal frameworks

**Rehabilitation management is** ability to manage injured workers and so a range of information is needed to cover such matters as rehabilitation and return to work programs.

# 1. INTRODUCTION

Employers and supervisors are obliged to implement all reasonable precautions to protect the health and safety of workers. Although the focus is placed on the operational phase of projects, much of the guidance also applies to construction and decommissioning activities. Companies should hire contractors that have the technical capability to manage the occupational health and safety issues of their employees, extending the application of the hazard management activities through formal procurement agreements.

## 1.1. Purpose and Scope of the Manual

---

This procedure is applicable to requirements at national and international level for workers health and safety. It is used to ensure workers health and safety in the IAIP/RTC.

## 1.2. Updating Frequency and Procedure

---

This manual can be updated any time when OSH committee raises change request and when approved by the management of IAIP/RTCs or based on the results of management review of the OSH performance evaluation.

## 2. STANDARDS, NORMS AND REGULATIONS

**The Ethiopian Labor proclamation** has established the provisions of OSH in work places. The proclamation clearly indicates the duties and responsibilities of the three parties: employer, employee and the government inspectors as stakeholders. There are OSH directives and guidelines used by OSH inspectors and safety officers to ensure the protection of workers.

**The Public Health Proclamation** determine the mechanism and steps to be taken for the promotion of the health of the society and creation of healthy environment. The law covers also the obligation of putting in place of minimum requirement of health and hygiene to be maintained in each enterprise.

**The Pension and Social Security for Public Servants Proclamation** has been clearly stipulated that any civil servant who served at least 10 years and has got an occupational accident and contracted occupational diseases is entitled for invalidity of pension for life.

**ILO Occupational safety and health and working environment Convention** emphasis to the promotion of occupational health and safety in industries and production sectors.

**ISO 18000 OSHA** specification gives requirements for an occupational health and safety (OHS) management system, to enable an organization to control its OSH risks and improve its performance on a continuous basis.

## 3. MANAGEMENT MODEL

### 3.1. Health Service Operation and Management

Management and operation of health in enterprises have at least the following organization structures: -

- Safety services delivery management team
- Health services delivery management team and
- Minimum Labor condition control team

Having the above organizational structures, Health management and operation at IAIP/RTCs shall have the following services:-

- Promotional programs including campaigns, awareness training and advocacy
- Occupational Safety and Health Research laboratories services
- Dissemination of OSH Information
- labor safety, health and condition inspection services
- medical examination
- curative treatment services (established clinics, agreed hospital services) including ambulance services

Among the above services, promotional programs, poison center or laboratory service, information dissemination, general medical checkups and medical treatment services can be outsourced for private or government owned service providers while labor safety, health and labor condition inspection services shall be given for regulatory body MoLSA or respective BoLSA.

The main functions to be handled by internal need to be coordination and assisting tenants to have linkages with service providers and safety, health and labor condition regular internal inspections.

Therefore, it is recommended that the nearby government health services provider to give preventive and curative health service at the established medium/higher health clinic for the workers and concerned communities in and nearby IAIP/RTCs. Referral procedures can also be created with this medium/higher clinic. Poison center or research laboratory services can be agreed between IAIP/RTCs on special conditions.

### 3.2. Proposed Organizational Structure

The proposed organizational structure of the IAIP showing its relationship with the concerned unit of RIPDC is given in Figure 3.1 while the detailed organizational structure of liquid management is given in Figure 3.2.

**Figure 3.1: Proposed Organizational Structure of IAIP/RTC**

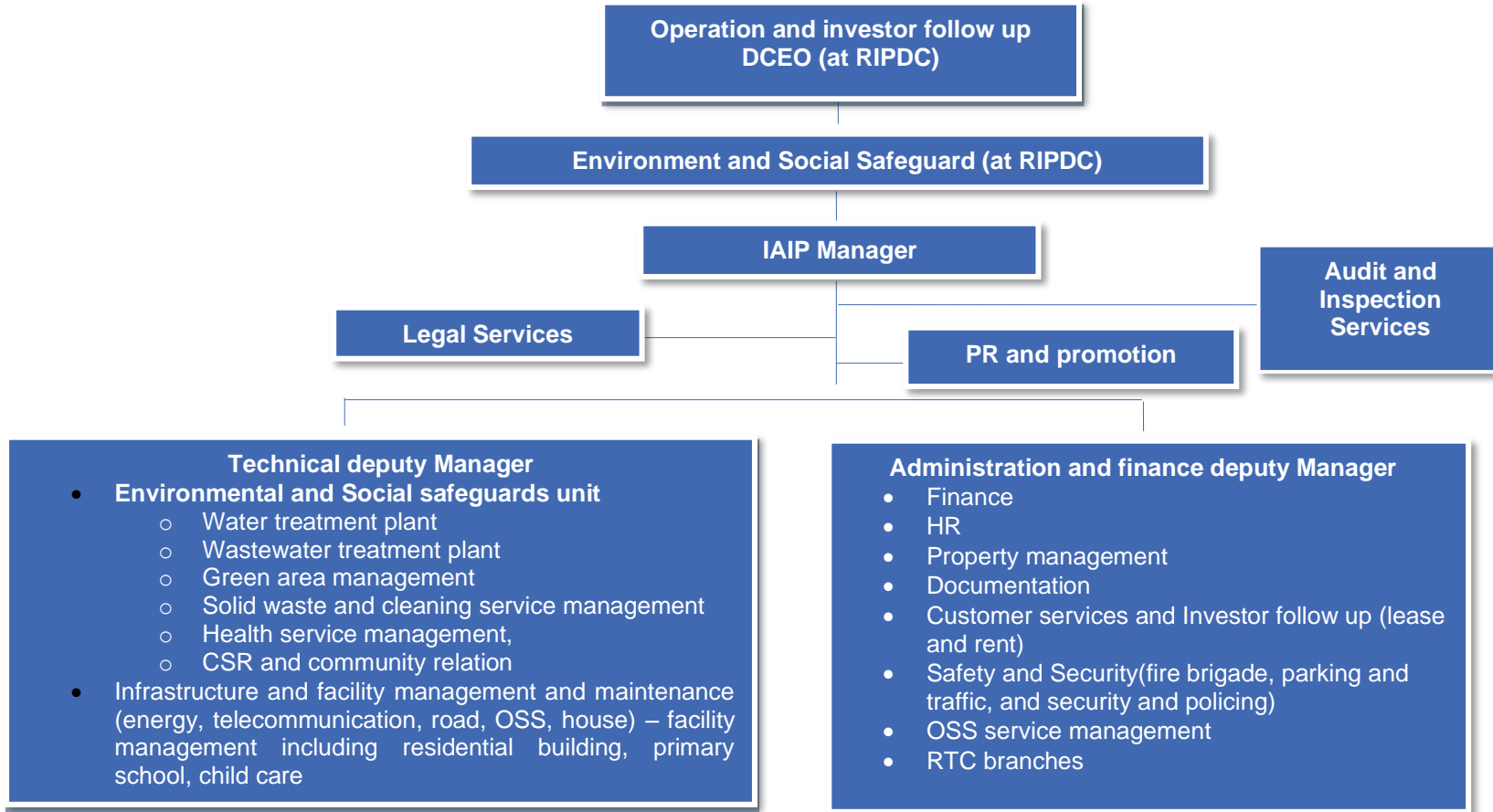
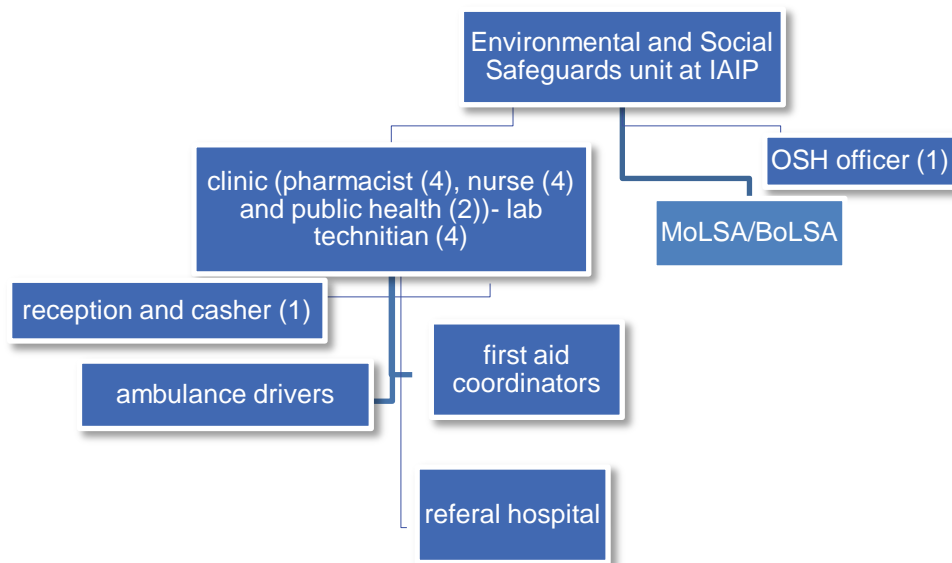


Figure 3.2: Organization structure of Health Service Operation and Management



### 3.3. Reporting Structure

The health service operation and management shall use the following reporting chain of command, mandatory to be respected by all the workers of the environmental and social safeguard unit which is under the technical deputy manager who in turn report to the manager of the park.

### 3.4. Roles and Responsibilities

According to the above organizational structure; the roles and responsibilities of IAIP/RTC OSH officer are to: -

1. minimize occupational accidents, diseases and disabilities at work places.
2. promote and encourage good health and safety of the worker at work places.
3. promote good and high standard working conditions above all strive for effective labor protection system is put in place and minimum working conditions are respected.
4. promote the construction of environmentally and human friendly work places.
5. Protect persons at work against contamination arising out of or in connection with the activities of persons at work.
6. Control the keeping and use of chemical substances which may be explosive or highly flammable or toxic otherwise dangerous substances or generally preventing the unlawful acquisition, possession and use of such substance at work.
7. Control the emission of dangerous levels of physical forms of energy such as radiation, heat, noise, vibration and light that are likely to be harmful and dangerous to health at workplaces.
8. Encourage a worker to fully participate in his/ her own safety and health care particularly to respect and implement all the available policy, guidelines and facilities provided at workplaces in the realm of occupational safety and health services.
9. ensure that all new work methods, processes, construction, machinery and substances in undertaking be it indigenous or imported are assessed for safety, health and environmental effects before they are allowed to be used in the country.



10. educate the worker, employer and public about occupational safety, health and working environment matters: "Knowledge is Power".
11. ensure all laws, regulations and other legal instruments pertaining safety, health and working environment are respected and complied with at all work places.
12. encourage and promote occupational safety and health information in general and occupational injuries information in particular at workplaces are recorded, analyzed, and reported to competent authorities.

At OSS the MoLSA/BoLSA team shall also play the following responsibilities: -

- enforcement of the provisions stipulated in the Labor Law Proclamation
- Provide advisory services in the form of conducting trainings and undertaking awareness creation program for workers and employers and public at large about occupational safety, health and terms and conditions of employment.
- register occupational injuries and compiles statistics at national level from those reports received from regional states of Labor Inspection Services
- conducts work place working environment monitoring in order to identify occupational hazards using simple and direct monitoring equipment's such as noise level meters, lux meters and thermal stress accessory equipment's

Additionally, the established medium/higher clinic is also required to provide: -

- first aid services including trainings
- medical treatments (nursing, pharmacy, lab service, examination etc)
- health promotion services (information dissemination, campaign, awareness, adolescent health services, environmental health services, public health services including nutrition etc)
- referral and ambulance services

## 4. OCCUPATIONAL HEALTH, INDUSTRIAL SAFETY AND ACCIDENTS PREVENTION ACTIVITIES/PLAN

Since IAIP/RTCs are operating in accordance with international and national requirements, the major plans to be implemented are: -

- a) The facility should avoid discrimination in the recruitment system. Medical testing is performed for assessing fitness to work only, and when required by local law specially food production
- b) Doctor clearance letter is indicated in new worker fitness
- c) protect pregnant women from hazardous process during pregnancy
- d) Social security scheme, health care insurance, leaves, maternity and other bonus shall be established by companies
- e) Primary health care shall be subsidized by facilities
- f) Legal hygiene requirements for food production or distribution areas should be followed by the facility
- g) Medical clinic or hospital close or inside the facility premises shall be available
- h) Medical emergency procedure and training records shall be in place
- i) Accident/injuries shall be recorded and analysed for preventive actions
- j) Sufficient number of toilets should be provided. (Please follow legal requirements)
- k) Regular analyses should be conducted to prove that water is drinkable. (by authorized associations)
- l) Active health and safety committee shall be in place
- m) Referral linkage shall be in place
- n) every undertaking employing 10 and more workers is required to establish safety and health committees
- o) bargaining tools on basic human health rights
- p) workers representation on decision making at IAIP/RTC management review meeting

Additionally, the following special initiative can also be planned and implemented at IAIP/RTCs:

- Elimination of malnutrition
- Elimination of Silicosis and Asbestosis Diseases
- Elimination of Violence and Sexual Harassment at Work
- Elimination of Persistent Organic Pollutants (POPs)
- Elimination of Drug Abuse at Workplaces
- Promotion of Work-Related Welfare Facilities
- Promotion of Well-Being Programs Including Healthy Lifestyles and Stress Prevention
- Application of Programs to Combat HIV/AIDS at the Workplace and the Application of ILO Code of Practice on HIV/AIDS
- Promotion of Programs on Gender Equality and Maternity Protection
- Programs for Promotion of OSH in Especially Hazardous Sectors or Agents
- Education, training, awareness raising and advocacy

## 5. BASIC STANDARD OPERATIONAL PROCEDURES

Employers and supervisors are obliged to implement all reasonable precautions to protect the health and safety of workers. This section provides guidance and examples of reasonable precautions to implement in managing principal risks to occupational health and safety. Although the focus is placed on the operational phase of projects, much of the guidance also applies to construction and decommissioning activities. Companies should hire contractors that have the technical capability to manage the occupational health and safety issues of their employees, extending the application of the hazard management activities through formal procurement agreements.

Preventive and protective measures should be introduced according to the following order of priority:

- ✓ **Eliminating the hazard** by removing the activity from the work process. Examples include substitution with less hazardous chemicals, using different manufacturing processes, etc;
- ✓ **Controlling the hazard** at its source through use of engineering controls. Examples include local exhaust ventilation, isolation rooms, machine guarding, acoustic insulating, etc;
- ✓ **Minimizing the hazard** through design of safe work systems and administrative or institutional control measures. Examples include job rotation, training safe work procedures, lock-out and tag-out, workplace monitoring, limiting exposure or work duration, etc.
- ✓ **Providing appropriate personal protective equipment (PPE)** in conjunction with training, use, and maintenance of the PPE. The application of prevention and control measures to occupational hazards should be based on comprehensive job safety or job hazard analyses. The results of these analyses should be prioritized as part of an action plan based on the likelihood and severity of the consequence of exposure to the identified hazards.

### 5.1. General Facility Design and Operation

---

#### 5.1.1. Integrity of Workplace Structures

Permanent and recurrent places of work should be designed and equipped to protect OHS:

- ✓ Surfaces, structures and installations should be easy to clean and maintain, and not allow for accumulation of hazardous compounds.
- ✓ Buildings should be structurally safe, provide appropriate protection against the climate, and have acceptable light and noise conditions.
- ✓ Fire resistant, noise-absorbing materials should, to the extent feasible, be used for cladding on ceilings and walls.
- ✓ Floors should be level, even, and non-skid.
- ✓ Heavy oscillating, rotating or alternating equipment should be located in dedicated buildings or structurally isolated sections.

### **5.1.2. Severe Weather and Facility Shutdown**

- ✓ Work place structures should be designed and constructed to withstand the expected elements for the region and have an area designated for safe refuge, if appropriate.
- ✓ Standard Operating Procedures (SOPs) should be developed for project or process shut-down, including an evacuation plan. Drills to practice the procedure and plan should also be undertaken annually.

### **5.1.3. Workspace and Exit**

The space provided for each worker, and in total, should be adequate for safe execution of all activities, including transport and interim storage of materials and products.

- ✓ Passages to emergency exits should be unobstructed at all times. Exits should be clearly marked to be visible in total darkness. The number and capacity of emergency exits should be sufficient for safe and orderly evacuation of the greatest number of people present at any time, and there should be a minimum two exits from any work area.
- ✓ Facilities also should be designed and built taking into account the needs of disabled persons.

### **5.1.4. Fire Precautions**

The workplace should be designed to prevent the start of fires through the implementation of fire codes applicable to industrial settings. Other essential measures include:

- ✓ Equipping facilities with fire detectors, alarm systems, and fire-fighting equipment. The equipment should be maintained in good working order and be readily accessible. It should be adequate for the dimensions and use of the premises, equipment installed, physical and chemical properties of substances present, and the maximum number of people present.
- ✓ Provision of manual firefighting equipment that is easily accessible and simple to use
- ✓ Fire and emergency alarm systems that are both audible and visible

### **5.1.5. Lavatories and Showers**

- ✓ Adequate lavatory facilities (toilets and washing areas) should be provided for the number of people expected to work in the facility and allowances made for segregated facilities, or for indicating whether the toilet facility is "In Use" or "Vacant". Toilet facilities should also be provided with adequate supplies of hot and cold running water, soap, and hand drying devices.
- ✓ Where workers may be exposed to substances poisonous by ingestion and skin contamination may occur, facilities for showering and changing into and out of street and work clothes should be provided.

### **5.1.6. Potable Water Supply**

- ✓ Adequate supplies of potable drinking water should be provided from a fountain with an upward jet or with a sanitary means of collecting the water for the purposes of drinking
- ✓ Water supplied to areas of food preparation or for the purpose of personal hygiene (washing or bathing) should meet drinking water quality standards

### 5.1.7. Clean Eating Area

Where there is potential for exposure to substances poisonous by ingestion, suitable arrangements are to be made for provision of clean eating areas where workers are not exposed to the hazardous or noxious substances.

### 5.1.8. Lighting

- ✓ Workplaces should, to the degree feasible, receive natural light and be supplemented with sufficient artificial illumination to promote workers' safety and health, and enable safe equipment operation. Supplemental 'task lighting' may be required where specific visual acuity requirements should be met.
- ✓ Emergency lighting of adequate intensity should be installed and automatically activated upon failure of the principal artificial light source to ensure safe shut-down, evacuation, etc.

### 5.1.9. Safe Access

- ✓ Passageways for pedestrians and vehicles within and outside buildings should be segregated and provide for easy, safe, and appropriate access
- ✓ Equipment and installations requiring servicing, inspection, and/or cleaning should have unobstructed, unrestricted, and ready access
- ✓ Hand, knee and foot railings should be installed on stairs, fixed ladders, platforms, permanent and interim floor openings, loading bays, ramps, etc.
- ✓ Openings should be sealed by gates or removable chains
- ✓ Covers should, if feasible, be installed to protect against falling items
- ✓ Measures to prevent unauthorized access to dangerous areas should be in place

### 5.1.10. First Aid

- ✓ The employer should ensure that qualified first-aid can be provided at all times. Appropriately equipped first-aid stations should be easily accessible throughout the place of work
- ✓ Eye-wash stations and/or emergency showers should be provided close to all workstations where immediate flushing with water is the recommended first-aid response
- ✓ Where the scale of work or the type of activity being carried out so requires, dedicated and appropriately equipped firstaid room(s) should be provided. First aid stations and rooms should be equipped with gloves, gowns, and masks for protection against direct contact with blood and other body fluids
- ✓ Remote sites should have written emergency procedures in place for dealing with cases of trauma or serious illness up to the point at which patient care can be transferred to an appropriate medical facility.

### 5.1.11. Air Supply

- ✓ Sufficient fresh air should be supplied for indoor and confined work spaces. Factors to be considered in ventilation design include physical activity, substances in use, and process related emissions. Air distribution systems should be designed so as not to expose workers to draughts
- ✓ Mechanical ventilation systems should be maintained in good working order. Point-source exhaust systems required for maintaining a safe ambient environment should have local indicators of correct functioning.

- ✓ Re-circulation of contaminated air is not acceptable. Air inlet filters should be kept clean and free of dust and microorganisms. Heating, ventilation and air conditioning (HVAC) and industrial evaporative cooling systems should be equipped, maintained and operated so as to prevent growth and spreading of disease agents (e.g. *Legionellapneumophilia*) or breeding of vectors (e.g. mosquitoes and flies) of public health concern.

#### 5.1.12. Work Environment Temperature

- ✓ The temperature in work, rest room and other welfare facilities should, during service hours, be maintained at a level appropriate for the purpose of the facility.

## 5.2. Communication and OHS Training

---

### 5.2.1 New employees

- ✓ Provisions should be made to provide OHS orientation training to all new employees to ensure they are apprised of the basic site rules of work at / on the site and of personal protection and preventing injury to fellow employees.
- ✓ Training should consist of basic hazard awareness, sitespecific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate. Any site-specific hazard or color coding in use should be thoroughly reviewed as part of orientation training.

### 5.2.2 Visitor Orientation

- ✓ If visitors to the site can gain access to areas where hazardous conditions or substances may be present, a visitor orientation and control program should be established to ensure visitors do not enter hazard areas unescorted.

### 5.2.3 New Task Employee and Contractor Training

- ✓ The employer should ensure that workers and contractors, prior to commencement of new assignments, have received adequate training and information enabling them to understand work hazards and to protect their health from hazardous ambient factors that may be present. The training should adequately cover:
  - Knowledge of materials, equipment, and tools
  - Known hazards in the operations and how they are controlled
  - Potential risks to health
  - Precautions to prevent exposure
  - Hygiene requirements
  - Wearing and use of protective equipment and clothing
  - Appropriate response to operation extremes, incidents and accidents

### 5.2.4 Basic OHS Training

- ✓ A basic occupational training program and specialty courses should be provided, as needed, to ensure that workers are oriented to the specific hazards of individual work assignments. Training should generally be provided to management, supervisors, workers, and occasional visitors to areas of risks and hazards.
- ✓ Workers with rescue and first-aid duties should receive dedicated training so as not to inadvertently aggravate exposures and health hazards to themselves or their

coworkers. Training would include the risks of becoming infected with blood-borne pathogens through contact with bodily fluids and tissue.

- ✓ Through appropriate contract specifications and monitoring, the employer should ensure that service providers, as well as contracted and subcontracted labor, are trained adequately before assignments begin.

### 5.2.5 Area Signage

- ✓ Hazardous areas (electrical rooms, compressor rooms, etc), installations, materials, safety measures, and emergency exits, etc. should be marked appropriately.
- ✓ Signage should be in accordance with international standards and be well known to, and easily understood by workers, visitors and the general public as appropriate.

### 5.2.6 Labeling of Equipment

- ✓ All vessels that may contain substances that are hazardous as a result of chemical or toxicological properties, or temperature or pressure, should be labeled as to the contents and hazard, or appropriately color coded.
- ✓ Similarly, piping systems that contain hazardous substances should be labeled with the direction of flow and contents of the pipe, or color coded whenever the pipe passing through a wall or floor is interrupted by a valve or junction device.

### 5.2.7 Communicate Hazard Codes

- ✓ Copies of the hazard coding system should be posted outside the facility at emergency entrance doors and fire emergency connection systems where they are likely to come to the attention of emergency services personnel.
- ✓ Information regarding the types of hazardous materials stored, handled or used at the facility, including typical maximum inventories and storage locations, should be shared proactively with emergency services and security personnel to expedite emergency response when needed.
- ✓ Representatives of local emergency and security services should be invited to participate in periodic (annual) orientation tours and site inspections to ensure familiarity with potential hazards present.

## 5.3. Physical Hazards

Physical hazards represent potential for accident or injury or illness due to repetitive exposure to mechanical action or work activity. Single exposure to physical hazards may result in a wide range of injuries, from minor and medical aid only, to disabling, catastrophic, and/or fatal. Multiple exposures over prolonged periods can result in disabling injuries of comparable significance and consequence.

### 5.3.1 Rotating and Moving Equipment

Injury or death can occur from being trapped, entangled, or struck by machinery parts due to unexpected starting of equipment or unobvious movement during operations. Recommended protective measures include:

- ✓ Designing machines to eliminate trap hazards and ensuring that extremities are kept out of harm's way under normal operating conditions. Examples of proper design

considerations include two-hand operated machines to prevent amputations or the availability of emergency stops dedicated to the machine and placed in strategic locations. Where a machine or equipment has an exposed moving part or exposed pinch point that may endanger the safety of any worker, the machine or equipment should be equipped with, and protected by, a guard or other device that prevents access to the moving part or pinch point. Guards should be designed and installed in conformance with appropriate machine safety standards.

- ✓ Turning off, disconnecting, isolating, and de-energizing (Locked Out and Tagged Out) machinery with exposed or guarded moving parts, or in which energy can be stored (e.g. compressed air, electrical components) during servicing or maintenance, in conformance with a standard
- ✓ Designing and installing equipment, where feasible, to enable routine service, such as lubrication, without removal of the guarding devices or mechanisms

### 5.3.2 Noise

Noise limits for different working environments are provided in Ethiopian standards

### 5.3.3 Vibration

Exposure to hand-arm vibration from equipment such as hand and power tools, or whole-body vibrations from surfaces on which the worker stands or sits, should be controlled through choice of equipment, installation of vibration dampening pads or devices, and limiting the duration of exposure. Limits for vibration and action values, (i.e. the level of exposure at which remediation should be initiated) should be checked on the basis of daily exposure time and data provided by equipment manufacturers.

### 5.3.4 Electrical

Exposed or faulty electrical devices, such as circuit breakers, panels, cables, cords and hand tools, can pose a serious risk to workers. Overhead wires can be struck by metal devices, such as poles or ladders, and by vehicles with metal booms. Vehicles or grounded metal objects brought into close proximity with overhead wires can result in arcing between the wires and the object, without actual contact. Recommended actions include:

- ✓ Marking all energized electrical devices and lines with warning signs
- ✓ Locking out (de-charging and leaving open with a controlled locking device) and tagging-out (warning sign placed on the lock) devices during service or maintenance
- ✓ Checking all electrical cords, cables, and hand power tools for frayed or exposed cords and following manufacturer recommendations for maximum permitted operating voltage of the portable hand tools
- ✓ Double insulating / grounding all electrical equipment used in environments that are, or may become, wet; using equipment with ground fault interrupter (GFI) protected circuits
- ✓ Protecting power cords and extension cords against damage from traffic by shielding or suspending above traffic areas
- ✓ Appropriate labeling of service rooms housing high voltage equipment ('electrical hazard') and where entry is controlled or prohibited (see also Section 3 on Planning, Siting, and Design);
- ✓ Establishing "No Approach" zones around or under high voltage power lines in conformance *ISO*



- ✓ Rubber tired construction or other vehicles that come into direct contact with, or arcing between, high voltage wires may need to be taken out of service for periods of 48 hours and have the tires replaced to prevent catastrophic tire and wheel assembly failure, potentially causing serious injury or death;
- ✓ Conducting detailed identification and marking of all buried electrical wiring prior to any excavation work

### 5.3.5 Eye Hazards

Solid particles from a wide variety of industrial operations, and / or a liquid chemical spray may strike a worker in the eye causing an eye injury or permanent blindness. Recommended measures include:

- ✓ Use of machine guards or splash shields and/or face and eye protection devices, such as safety glasses with side shields, goggles, and/or a full face shield. Specific Safe Operating Procedures (SOPs) may be required for use of sanding and grinding tools and/or when working around liquid chemicals. Frequent checks of these types of equipment prior to use to ensure mechanical integrity is also good practice. Machine and equipment guarding should conform to standards
- ✓ Moving areas where the discharge of solid fragments, liquid, or gaseous emissions can reasonably be predicted (e.g. discharge of sparks from a metal cutting station, pressure relief valve discharge) away from places expected to be occupied or transited by workers or visitors. Where machine or work fragments could present a hazard to transient workers or passers-by, extra area guarding or proximity restricting systems should be implemented, or PPE required for transients and visitors.
- ✓ Provisions should be made for persons who have to wear prescription glasses either through the use over glasses or prescription hardened glasses.

### 5.3.6 Welding / Hot Work

Welding creates an extremely bright and intense light that may seriously injure a worker's eyesight. In extreme cases, blindness may result. Additionally, welding may produce noxious fumes to which prolonged exposure can cause serious chronic diseases. Recommended measures include:

- ✓ Provision of proper eye protection such as welder goggles and/or a full-face eye shield for all personnel involved in, or assisting, welding operations. Additional methods may include the use of welding barrier screens around the specific work station (a solid piece of light metal, canvas, or plywood designed to block welding light from others). Devices to extract and remove noxious fumes at the source may also be required.
- ✓ Special hot work and fire prevention precautions and Standard Operating Procedures (SOPs) should be implemented if welding or hot cutting is undertaken outside established welding work stations, including 'Hot Work Permits, stand-by fire extinguishers, stand-by fire watch, and maintaining the fire watch for up to one hour after welding or hot cutting has terminated. Special procedures are required for hot work on tanks or vessels that have contained flammable materials.

### 5.3.7 Industrial Vehicle Driving and Site Traffic

Poorly trained or inexperienced industrial vehicle drivers have increased risk of accident with other vehicles, pedestrians, and equipment. Industrial vehicles and delivery vehicles, as well as private vehicles on-site, also represent potential collision scenarios. Industrial vehicle driving and site traffic safety practices include:

- ✓ Training and licensing industrial vehicle operators in the safe operation of specialized vehicles such as forklifts, including safe loading/unloading, load limits
- ✓ Ensuring drivers undergo medical surveillance
- ✓ Ensuring moving equipment with restricted rear visibility is outfitted with audible back-up alarms
- ✓ Establishing rights-of-way, site speed limits, vehicle inspection requirements, operating rules and procedures (e.g. prohibiting operation of forklifts with forks in down position), and control of traffic patterns or direction
- ✓ Restricting the circulation of delivery and private vehicles to defined routes and areas, giving preference to 'one-way' circulation, where appropriate

### **5.3.8 Working Environment Temperature**

Exposure to hot or cold working conditions in indoor or outdoor environments can result in temperature stress-related injury or death. Use of personal protective equipment (PPE) to protect against other occupational hazards can accentuate and aggravate heat-related illnesses. Extreme temperatures in permanent work environments should be avoided through implementation of engineering controls and ventilation. Where this is not possible, such as during short-term outdoor work, temperature-related stress management procedures should be implemented which include:

- ✓ Monitoring weather forecasts for outdoor work to provide advance warning of extreme weather and scheduling work accordingly
- ✓ Adjustment of work and rest periods according to temperature stress management depending on the temperature and workloads
- ✓ Providing temporary shelters to protect against the elements during working activities or for use as rest areas
- ✓ Use of protective clothing
- ✓ Providing easy access to adequate hydration such as drinking water or electrolyte drinks, and avoiding consumption of alcoholic beverages

### **5.3.9 Ergonomics, Repetitive Motion, Manual Handling**

Injuries due to ergonomic factors, such as repetitive motion, overexertion, and manual handling, take prolonged and repeated exposures to develop, and typically require periods of weeks to months for recovery. These OHS problems should be minimized or eliminated to maintain a productive workplace. Controls may include:

- ✓ Facility and workstation design with 5th to 95th percentile operational and maintenance workers in mind
- ✓ Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools and work objects, and requiring multi-person lifts if weights exceed thresholds
- ✓ Selecting and designing tools that reduce force requirements and holding times, and improve postures
- ✓ Providing user adjustable work stations
- ✓ Incorporating rest and stretch breaks into work processes, and conducting job rotation
- ✓ Implementing quality control and maintenance programs that reduce unnecessary forces and exertions
- ✓ Taking into consideration additional special conditions such as left handed persons

### 5.3.10 Working at Heights

Fall prevention and protection measures should be implemented whenever a worker is exposed to the hazard of falling more than two meters; into operating machinery; into water or other liquid; into hazardous substances; or through an opening in a work surface. Fall prevention / protection measures may also be warranted on a case-specific basis when there are risks of falling from lesser heights. Fall prevention may include:

- ✓ Installation of guardrails with mid-rails and toe boards at the edge of any fall hazard area
- ✓ Proper use of ladders and scaffolds by trained employees
- ✓ Use of fall prevention devices, including safety belt and lanyard travel limiting devices to prevent access to fall hazard area, or fall protection devices such as full body harnesses used in conjunction with shock absorbing lanyards or self-retracting inertial fall arrest devices attached to fixed anchor point or horizontal life-lines
- ✓ Appropriate training in use, serviceability, and integrity of the necessary PPE
- ✓ Inclusion of rescue and/or recovery plans, and equipment to respond to workers after an arrested fall

### 5.3.11 Illumination

Work area light intensity should be adequate for the general purpose of the location and type of activity, and should be supplemented with dedicated work station illumination, as needed.

Controls should include:

- ✓ Use of energy efficient light sources with minimum heat emission
- ✓ Undertaking measures to eliminate glare / reflections and flickering of lights
- ✓ Taking precautions to minimize and control optical radiation including direct sunlight. Exposure to high intensity UV and IR radiation and high intensity visible light should also be controlled
- ✓ Controlling laser hazards in accordance with equipment specifications, certifications, and recognized safety standards. The lowest feasible class Laser should be applied to minimize risks.

## 5.4. Chemical Hazards

Chemical hazards represent potential for illness or injury due to single acute exposure or chronic repetitive exposure to toxic, corrosive, sensitizing or oxidative substances. They also represent a risk of uncontrolled reaction, including the risk of fire and explosion, if incompatible chemicals are inadvertently mixed. Chemical hazards can most effectively be prevented through a hierarchical approach that includes:

- ✓ Replacement of the hazardous substance with a less hazardous substitute
- ✓ Implementation of engineering and administrative control measures to avoid or minimize the release of hazardous substances into the work environment keeping the level of exposure below internationally established or recognized limits
- ✓ Keeping the number of employees exposed, or likely to become exposed, to a minimum
- ✓ Communicating chemical hazards to workers through labeling and marking according to national and internationally recognized requirements and standards, including the International Chemical Safety Cards (ICSC), Materials Safety Data Sheets (MSDS), or equivalent. Any means of written communication should be in an easily understood language and be readily available to exposed workers and first-aid personnel

- ✓ Training workers in the use of the available information (such as MSDSs), safe work practices, and appropriate use of PPE

#### 5.4.1 Air Quality

Poor air quality due to the release of contaminants into the workplace can result in possible respiratory irritation, discomfort, or illness to workers. Employers should take appropriate measures to maintain air quality in the work area. These include:

- ✓ Maintaining levels of contaminant dusts, vapors and gases in the work environment at concentrations
- ✓ Developing and implementing work practices to minimize release of contaminants into the work environment including:
  - Direct piping of liquid and gaseous materials
  - Minimized handling of dry powdered materials;
  - Enclosed operations
  - Local exhaust ventilation at emission / release points
  - Vacuum transfer of dry material rather than mechanical or pneumatic conveyance
  - Indoor secure storage, and sealed containers rather than loose storage
- ✓ Where ambient air contains several materials that have similar effects on the same body organs (additive effects), taking into account combined exposures using calculations
- ✓ Where work shifts extend beyond eight (8) hours, calculating adjusted workplace exposure criteria

#### 5.4.2 Fire and Explosions

Fires and or explosions resulting from ignition of flammable materials or gases can lead to loss of property as well as possible injury or fatalities to project workers. Prevention and control strategies include:

- ✓ Storing flammables away from ignition sources and oxidizing materials. Further, flammables storage area should be:
  - Remote from entry and exit points into buildings
  - Away from facility ventilation intakes or vents
  - Have natural or passive floor and ceiling level ventilation and explosion venting
  - Use spark-proof fixtures
  - Be equipped with fire extinguishing devices and self-closing doors, and constructed of materials made to withstand flame impingement for a moderate period of time
- ✓ Providing bonding and grounding of, and between, containers and additional mechanical floor level ventilation if materials are being, or could be, dispensed in the storage area
- ✓ Where the flammable material is mainly comprised of dust, providing electrical grounding, spark detection, and, if needed, quenching systems
- ✓ Defining and labeling fire hazards areas to warn of special rules (e.g. prohibition in use of smoking materials, cellular phones, or other potential spark generating equipment)
- ✓ Providing specific worker training in handling of flammable materials, and in fire prevention or suppression

### 5.4.3 Corrosive, Oxidizing, and Reactive Chemicals

Corrosive, oxidizing, and reactive chemicals present similar hazards and require similar control measures as flammable materials. However, the added hazard of these chemicals is that inadvertent mixing or intermixing may cause serious adverse reactions. This can lead to the release of flammable or toxic materials and gases, and may lead directly to fires and explosions. These types of substances have the additional hazard of causing significant personal injury upon direct contact, regardless of any intermixing issues. The following controls should be observed in the work environment when handling such chemicals:

- ✓ Corrosive, oxidizing and reactive chemicals should be segregated from flammable materials and from other chemicals of incompatible class (acids vs. bases, oxidizers vs. reducers, water sensitive vs. water based, etc.), stored in ventilated areas and in containers with appropriate secondary containment to minimize intermixing during spills
- ✓ Workers who are required to handle corrosive, oxidizing, or reactive chemicals should be provided with specialized training and provided with, and wear, appropriate PPE (gloves, apron, splash suits, face shield or goggles, etc).
- ✓ Where corrosive, oxidizing, or reactive chemicals are used, handled, or stored, qualified first-aid should be ensured at all times. Appropriately equipped first-aid stations should be easily accessible throughout the place of work, and eye-wash stations and/or emergency showers should be provided close to all workstations where the recommended first-aid response is immediate flushing with water

### 5.4.4 Asbestos Containing Materials (ACM)

The use of asbestos containing materials (ACM) should be avoided in new buildings or as a new material in remodeling or renovation activities. Existing facilities with ACM should develop an asbestos management plan which clearly identifies the locations where the ACM is present, its condition (e.g. whether it is in friable form with the potential to release fibers), procedures for monitoring its condition, procedures to access the locations where ACM is present to avoid damage, and training of staff who can potentially come into contact with the material to avoid damage and prevent exposure. The plan should be made available to all persons involved in operations and maintenance activities. Repair or removal and disposal of existing ACM in buildings should only be performed by specially trained personnel following host country requirements, or in their absence, internationally recognized procedures.

## 5.5. Biological Hazards

Biological agents represent potential for illness or injury due to single acute exposure or chronic repetitive exposure. Biological hazards can be prevented most effectively by implementing the following measures:

- ✓ If the nature of the activity permits, use of any harmful biological agents should be avoided and replaced with an agent that, under normal conditions of use, is not dangerous or less dangerous to workers. If use of harmful agents cannot be avoided, precautions should be taken to keep the risk of exposure as low as possible and maintained below internationally established and recognized exposure limits.
- ✓ Work processes, engineering, and administrative controls should be designed, maintained, and operated to avoid or minimize release of biological agents into the working environment. The number of employees exposed or likely to become exposed should be kept at a minimum.

- ✓ The employer should review and assess known and suspected presence of biological agents at the place of work and implement appropriate safety measures, monitoring, training, and training verification programs.
- ✓ Measures to eliminate and control hazards from known and suspected biological agents at the place of work should be designed, implemented and maintained in close co-operation with the local health authorities and according to recognized international standards.

Biological agents should be classified into four groups:

- ✓ **Group 1:** Biological agents unlikely to cause human disease, and consequently only require controls similar to those required for hazardous or reactive chemical substances;
- ✓ **Group 2:** Biological agents that can cause human disease and are thereby likely to require additional controls, but are unlikely to spread to the community;
- ✓ **Group 3:** Biological agents that can cause severe human disease, present a serious hazard to workers, and may present a risk of spreading to the community, for which there usually is effective prophylaxis or treatment available and are thereby likely to require extensive additional controls;
- ✓ **Group 4:** Biological agents that can cause severe human disease, are a serious hazard to workers, and present a high risk of spreading to the community, for which there is usually no effective prophylaxis or treatment available and are thereby likely to require very extensive additional controls.

The employer should at all times encourage and enforce the highest level of hygiene and personal protection, especially for activities employing biological agents of Groups 3 and 4 above. Work involving agents in Groups 3 and 4 should be restricted only to those persons who have received specific verifiable training in working with and controlling such materials.

Areas used for the handling of Groups 3 and 4 biological agents should be designed to enable their full segregation and isolation in emergency circumstances, include independent ventilation systems, and be subject to SOPs requiring routine disinfection and sterilization of the work surfaces.

HVAC systems serving areas handling Groups 3 and 4 biological agents should be equipped with High Efficiency Particulate Air (HEPA) filtration systems. Equipment should readily enable their disinfection and sterilization, and maintained and operated so as to prevent growth and spreading of disease agents, amplification of the biological agents, or breeding of vectors e.g. mosquitoes and flies of public health concern.

## 5.6. Radiological Hazards

Radiation exposure can lead to potential discomfort, injury or serious illness to workers. Prevention and control strategies include:

- ✓ Places of work involving occupational and/or natural exposure to ionizing radiation should be established and operated in accordance with recognized international safety standards and guidelines

- ✓ Exposure to non-ionizing radiation (including static magnetic fields; sub-radio frequency magnetic fields; static electric fields; radio frequency and microwave radiation; light and near-infrared radiation; and ultraviolet radiation) should be controlled to internationally recommended limits
- ✓ In the case of both ionizing and non-ionizing radiation, the preferred method for controlling exposure is shielding and limiting the radiation source. Personal protective equipment is supplemental only or for emergency use. Personal protective equipment for near-infrared, visible and ultraviolet range radiation can include appropriate sun block creams, with or without appropriate screening clothing.

### **5.7. Personal Protective Equipment (PPE)**

Personal Protective Equipment (PPE) provides additional protection to workers exposed to workplace hazards in conjunction with other facility controls and safety systems.

PPE is considered to be a last resort that is above and beyond the other facility controls and provides the worker with an extra level of personal protection.

Occupational hazards and types of PPE are available for different purposes. Recommended measures for use of PPE in the workplace include:

- ✓ Active use of PPE if alternative technologies, work plans or procedures cannot eliminate, or sufficiently reduce, a hazard or exposure
- ✓ Identification and provision of appropriate PPE that offers adequate protection to the worker, co-workers, and occasional visitors, without incurring unnecessary inconvenience to the individual
- ✓ Proper maintenance of PPE, including cleaning when dirty and replacement when damaged or worn out. Proper use of PPE should be part of the recurrent training programs for employees
- ✓ Selection of PPE should be based on the hazard and risk ranking described earlier in this section, and selected according to criteria on performance and testing established by recognized organizations

## 6. MONITORING

Occupational health and safety monitoring programs should verify the effectiveness of prevention and control strategies. The selected indicators should be representative of the most significant occupational, health, and safety hazards, and the implementation of prevention and control strategies. The occupational health and safety monitoring program should include:

- ✓ *Safety inspection, testing and calibration:* This should include regular inspection and testing of all safety features and hazard control measures focusing on engineering and personal protective features, work procedures, places of work, installations, equipment, and tools used. The inspection should verify that issued PPE continues to provide adequate protection and is being worn as required. All instruments installed or used for monitoring and recording of working environment parameters should be regularly tested and calibrated, and the respective records maintained.
- ✓ *Surveillance of the working environment:* Employers should document compliance using an appropriate combination of portable and stationary sampling and monitoring instruments. Monitoring and analyses should be conducted according to internationally recognized methods and standards. Monitoring methodology, locations, frequencies, and parameters should be established individually for each project following a review of the hazards. Generally, monitoring should be performed during commissioning of facilities or equipment and at the end of the defect and liability period, and otherwise repeated according to the monitoring plan.
- ✓ *Surveillance of workers health:* When extraordinary protective measures are required (for example, against biological agents Groups 3 and 4, and/or hazardous compounds), workers should be provided appropriate and relevant health surveillance prior to first exposure, and at regular intervals thereafter. The surveillance should, if deemed necessary, be continued after termination of the employment.
- ✓ *Training:* Training activities for employees and visitors should be adequately monitored and documented (curriculum, duration, and participants). Emergency exercises, including fire drills, should be documented adequately. Service providers and contractors should be contractually required to submit to the employer adequate training documentation before start of their assignment.

### *Accidents and Diseases monitoring*

- ✓ The employer should establish procedures and systems for reporting and recording
  - Occupational accidents and diseases
  - Dangerous occurrences and incidents

These systems should enable workers to report immediately to their immediate supervisor any situation they believe presents a serious danger to life or health.

- ✓ The systems and the employer should further enable and encourage workers to report to management all:
  - Occupational injuries and near misses
  - Suspected cases of occupational disease
  - Dangerous occurrences and incidents



- ✓ All reported occupational accidents, occupational diseases, dangerous occurrences, and incidents together with near misses should be investigated with the assistance of a person knowledgeable/competent in occupational safety. The investigation should:
  - Establish what happened
  - Determine the cause of what happened
  - Identify measures necessary to prevent a recurrence

## 7. COST RECOVERY

The cost of OSH needs to be covered by individual Enterprises. In case of preventive and curative health service provision; RIPDC shall provide facilities like clinic and necessary medical equipment while service provision shall be handled by nearby city government health office. IAIP clinics can be considered as medium of higher clinic while RTCs clinics can be called 'health center'.

# ANNEXES

## Annex 1: OSH Issues Descriptions and Formats

### I. OHS Policy:

OHS Policy is signed by a senior person in the company, dated, and placed in a prominent location so that people in the workplace can see it.

### II. Consultation and communication

Consultation and communication is part of all Managers duties to review the OHS Implementation Plan, OHS POLICY, and procedures on a regular basis to ensure that they are being adhered to and that they comply with legislative requirements. It can be auditable if Safety Meeting Minutes are in place.

### III. Hazard identification and risk assessment

Hazard identification and risk assessment are essential steps in providing and maintaining a safe and healthy work environment. Hazard Reporting enables hazards to be identified in all areas of the workplace in order to facilitate assessment and the selection of appropriate control strategies. Hazard identification process can use the following forms

- Hazard Report Form
- Hazard Record Book
- Fire Equipment Inspection Checklist
- Office Hazard Inspection Checklist
- Vehicle Inspection Checklist
- Hazard Flowchart

### IV. Incident reporting and investigation

An incident is an unplanned event that has resulted in, or has the potential to result in injury, illness, damage or loss. The term 'incident' includes accidents and near hits.

Incidents should be reported and investigated as soon as practical after the event to prevent re-occurrences. The aim of incident investigation is to identify deficiencies in the occupational health and safety management system and improve the existing system to prevent further incidents, not to assign blame. The main record requirements are the following:-

- Incident Report Form
- First Aid Register

### V. first aid treatment and facilities

First aid provides for the initial and immediate attention to a person suffering an injury or illness. Requirements for first aid kits and facilities are set out in WHO guideline and Ethiopian OSH legal frameworks.

- First Aid Register
- First Aid Implementation Action Plan

### VI. Rehabilitation management

Employers need to be equipped to manage injured workers and so a range of information is needed to cover such matters as rehabilitation and return to work programs.

It is important that all lost time injuries are managed, to ensure that employees understand their value to the employer and the benefits of an early return to work.

Employers should liaise with their insurers to make rehabilitation as effective as possible. Insurers are obviously keen to put effective rehabilitation into practice as reductions in the cost of workers compensation flow from such schemes. These scheme can be managed Return to Work Plan.

### **VII. Emergency management**

Emergency procedures should be developed to ensure the controlled management of the emergency and evacuation of the workplace until the appropriate emergency service/s arrives to take control. Applicable format is Emergency management plan.

### **VIII. OHS training**

All employees must be trained in the work they perform. New employees should receive induction training to advise them of specific hazards and procedures in the workplace.

Applicable formats to be used are:-

- Training schedule Template
- Record of Attendance and Training Content Form
- Employee Training Record
- Essential Induction Training program

### **IX. Notice and signs**

An effective way to communicate OHS information is by the use of notices and safety signs.

### **X. List of possible PPE**

Examples of Personal Protective Equipment (PPE) include:

- Safety Glasses
- Safety footwear (steel cap boots, shoes, rubber boots, non-slip shoes)
- Safety goggles, face shields
- Ear plugs, ear muffs
- Hard hats
- Welding shields
- Aprons
- Overalls
- Gloves
- Gauntlets
- Respiratory protection (dust masks, respirators, self-contained breathing apparatus etc)

## Annex 2: Clinic Standard

Medium clinic shall have the following minimum infrastructural requirements:-

Premises required	No. of rooms required	Area required
Reception, Registration/ Recording & Waiting area	1	16 sq. m
Examination room	1	12 sq. m
Labouring, Delivery and Postnatal rooms	3	27 sq.m
MCH room	1	9 sq.m
Treatment/ procedure/ injection room,	1	12 sq. m
Laboratory room	1	20 sq. m
X-ray room as per ERPA requirements(optional)		
Emergency resuscitation room with two beds	1	16 sq. m
Instrument processing room	1	12 sq. m
Staff room	1	9 sq. m
Toilet (Male &Female)	2	8 sq. m
Incinerator		
Area for placenta pit		

## Annex 3: Pharmaceutical Storage Guideline

Activities	Justification
1. Store pharmaceuticals in a dry, well-lit, well-ventilated storeroom - away from direct sunlight. Temperatures in the storeroom should not exceed 25°C.	Extreme heat and exposure to direct sunlight can degrade pharmaceuticals and dramatically shorten shelf life. Direct sunlight raises the temperature of the product and can reduce its shelf life or may damage the product by other mechanisms.
2. Clean and disinfect the storeroom regularly. Keep food and drink out of the storeroom.	Pests are less attracted to the storeroom if it is regularly cleaned and disinfected. The outside of the store should also be kept clean, and any garbage should be stored in covered containers. Water should not be allowed to stagnate near the building. Would should be varnished or painted to discourage pests. If possible, a regular schedule for extermination will also help eliminate pests.
3. Protect storeroom from water and moisture.	Moisture can destroy both supplies and their packaging. If the packaging is damaged, the product is still unacceptable to the patient even when the pharmaceutical is not damaged.
4. Keep fire safety equipment available, accessible, and functional, and train employees to use it.	Stopping a fire before it spreads can save expensive supplies and the storage facility. The right equipment should be available; water is able to put out paper fires, but is ineffective on electrical and chemical fires. Place well-maintained fire extinguishers at suitable positions in the storeroom. If a fire extinguisher is not available, keep sand or soil in a bucket nearby.

Activities		Justification
5	Store latex products away from electric motors and fluorescent lights.	Latex products can be damaged if they are directly exposed to fluorescent lights and electric motors. Electric motors and fluorescent lights create the chemical ozone which can rapidly deteriorate latex products. Keep latex products in paper boxes and cartons.
5	Maintain cold storage, including a cold chain, as required.	Cold storage (2 to 8 degrees Celsius or 36 to 46 degrees Fahrenheit) is essential for maintaining the shelf life of certain pharmaceuticals. These items are irrevocably damaged if the cold chain is broken. If electricity is unreliable, the use of cylindered gas or kerosene-powered refrigeration is recommended. Many drugs require storage below 25 oC. There may also be products that should be stored at a temperature below 0oC and hence the required storage condition should be maintained for these products.
7.	Limit storage area access to authorized personnel. Drugs which need an access-controlled environment such as narcotics, psychotropic, etc. should be stored under lock and key separate from the rest of stock preferably a locked wire cage within the storage facility or a lockable cabinet.	To prevent theft and pilferage, lock the storeroom and/or limit access to personnel other than authorized staff, and track the movement of pharmaceuticals.
8.	Stack cartons at least 10 cm off the floor, 30 cm away from the wall and other stacks, and no more than 2.5m high.	Pallets keep the products off the floor so they are less susceptible to pests, water and dirt damage. Stack pallets 30 cm away from the walls and each other to promote air circulation and to ease movement of stock, cleaning and inspection.  Do not stack cartons more than 2.5m as the weight of the products may crush the cartons at the bottom. This will reduce potential injury to warehouse personnel. If cartons are particularly heavy, stack cartons less than 2.5m. Where feasible, strong well-organized shelving is preferred.
9.	Store medical supplies away from insecticides, chemicals, old files, office supplies and other materials.	Exposure to insecticides and other chemicals may affect the shelf life of pharmaceuticals. Old files and office supplies may get in the way and reduce space for medical supplies or make them less accessible. "De-junking" the storeroom regularly makes more space for storage.
10.	Store flammable products separately from other products. Take appropriate safety precautions.  Storage areas and cabinets should be clearly marked to indicate that they contain highly flammable liquids and should display the international hazard symbol.  Corrosive or oxidant products, laboratory chemicals and reagents should be stored away from flammables, ideally in a separate steel cabinet to prevent leakage.	Some medical procedures use flammable products, such as alcohol, cylindered gas, or mineral spirits. Such products should be stored in the coolest possible place, away from electrical appliances and other products and near a fire extinguisher.
11.	Store pharmaceuticals to facilitate FEFO procedures and stock management.	FEFO (First Expiry, First Out) is a method of managing drugs in a storage facility where the drugs are managed by

Activities		Justification
		their expiry date. Drugs that will expire first are issued first, regardless of when they were received at the health facility.
12.	Store drugs in their original shipping cartons. Arrange cartons with arrows pointing up, and with identification labels, expiry dates, and manufacturing dates clearly visible.	Drugs should not be opened to repackage them. Store supplies in their original shipping cartons. Items should be stored according to manufacturer's instructions on the cartons; this includes paying attention to the direction of the arrows. Identification labels make it easier to follow FEFO, and make it easier to select the right product.
13.	Separate unusable pharmaceuticals from usable pharmaceuticals and dispose of damaged or expired products without delay.	Do not dispense expired drugs to the patients. Designate a separate part of the storeroom for damaged and expired goods.



PRO  
SEAD



# Child Care Center Manual

For Regional Industrial Park Development Corporations  
(RIPDC) and Integrated Agro Industrial Parks (IAIP)



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## ABBREVIATIONS

<b>CRC</b>	Convention on the Rights of the Child
<b>FDRE</b>	Federal Democratic Republic of Ethiopia
<b>IAIP</b>	Integrated Agro-Industry Park
<b>MoWA</b>	Ministry of Women's Affairs
<b>RTC</b>	Rural Transformation Centers
<b>SOP</b>	Standard Operating Procedures

## OPERATIONAL DEFINITION OF TERMS

"**Child**" means any person less than 13 years of age

"**Childcare center**" means the premises in which care is provided at any one time for ten or more children.

"**Communicable disease**" means an illness due to an infectious agent or its toxic products which is transmitted directly or indirectly by the infected agent to a susceptible host.

"**Education**" means the entire process of social life by means of which individuals and social groups learn to develop consciously within, and for the benefit of, the national and international communities, the whole of their personal capacities, attitudes, aptitudes and knowledge.

"**Health**" means a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

"**Infant**" means a child from birth to 1 year of age.

"**Older toddler**" means a child from 2 to 3 years of age

"**Parent**" means the biological mother or father or the guardian of the child and includes any other person having the care and custody of a child.

"**Preschool**" means a child from 3 to 4 years of age.

"**Staff**" means a paid employee performing services in a child care.

"**Supervisor**" means a person who is responsible for child care activities.

"**Toddler**" means a child from 1 to 3 years of age.

"**Young toddler**" means a child from 1 to 2 years of age.

# 1. INTRODUCTION

## 1.1. Purpose and Scope of the Manual

This manual explains the step-by-step process of operating the childcare center that provides services for children of workers in IAIP and RTC. A potential services provided by childcare center is included, in addition to proposed organizations. Therefore the purpose of this manual is:

- To facilitate safe and healthful care of a child in a childcare center;
- To support families by providing care that promotes emotional, cognitive, communicative, perceptual-motor, physical and social development of children;
- To promote the welfare, development and learning of children through child care facilities;
- To provide standards to aid in protecting the health, safety and rights of children and to reduce risks to children in childcare centers; and
- To identify the minimum level of compliance necessary to establish competent childcare center in IAIP.

The manual also address requirements childcare center for industrial parks in general and take into account agro-processing industries and the local context in particular. Thus it can be used for day-to-day operation of Childcare Center in IAIP and RTC.

## 1.2. Updating Frequency and Procedure

Amendment or changes to this manual may be made on the basis of the written recommendations forwarded by any administrator of IAIPs related to childcare center as the case may be and up on approval of the Board of Directors. The procedure for the amendment or changes of the manual is as follow:

- Request may be raised from any administrator describing the reasons for updating the manual.
- One or more authors can be assigned to update the manual and the authors should have specific knowledge with this regard.
- The draft document is prepared by the assigned author(s); the assigned author(s) ensures the involvement of the concerned employees during manual updating.
- The final draft updated manual is reviewed and approved for clarity, completeness and adequacy by the head of the childcare center and IAIP management.
- The updated and approved manual is distributed to the childcare center management and the work units have the responsibilities to implement the manual in their respective functions

## 2. REVIEW OF STANDARDS, NORMS AND REGULATIONS

The Constitution of the Federal Democratic Republic of Ethiopia affirms the rights of all persons including men, women and children alike. One of the pillars of the Constitution is the right to equality and non-discrimination. The Ethiopian Constitution recognizes the vulnerable position of children and guarantees their right to protection. The Constitution also stipulates that human rights and freedoms, emanating from the nature of mankind, are inviolable and inalienable.

The FDRE Constitution stipulates important provision on the rights of children. The Constitution devotes special section specifying rights pertaining to children solely. In particular, Article 36 of the Constitution incorporates rights of children in the supreme law of the land. Therefore, the FDRE Constitution recognizes the rights of children to life, to name and nationality, and to know and be cared for by his or her parents. It provides the right of children to live a life protected from violence, neglect, exploitation and abuse.

The Convention on the Rights of the Child was adopted by the General Assembly of the United Nations on November 20, 1989. The treaty came into force on 2 September 1990. Ethiopia ratified the Convention on the Rights of the Child (CRC) on December 9, 1991 by virtue of Proclamation 10/1992.

Article 24(1) assures the right of children to highest attainable standard of health and to facilities for the treatment of illness and rehabilitation of health. The right to the highest attainable standard of health is not the same as the right to health care. Instead, the right to health encompasses a myriad of socio-economic factors necessary to lead a healthy life, and includes the underlying determinants of health such as food and nutrition, housing, access to safe and potable water and adequate sanitation, safe and healthy working conditions and a healthy environment.

Article 28 of the CRC affirms the right of the child to education. The Convention demonstrates that the right to education is a core minimum right and an engine for economic growth.

Article 28(1) (a) stipulates that “free” education at the primary level is a core minimum that States Parties must be obligated to fulfill for all children.

The practice of rendering childcare services has a long history in the country, but it was not until 2001 that standardized regulatory mechanisms were developed. The national Guidelines on institutional childcare were developed in 2001.

The 2001 Childcare Guidelines are revised in 2008 pursuant to The Convention on the Rights of the Child, the African Charter on the Rights and Welfare of the Child, and the laws of the country.

The revised Guidelines provide the minimum conditions for child care services such as but not limited on:

- Physical structure requirement (see **Annex I**),
- Type of services and minimum required activities of a childcare,
- Human resources requirement and responsibilities, and
- Record keeping.

It also outlines measures and good practices to support, care and protect children within the economic, social and political context of the country.

The revised guidelines states how the childcare is established and registered as:

- The establishment of a childcare shall be preceded by the approval of a project proposal of the childcare by the accredited governmental bodies.
- A party that proposes to establish a childcare shall produce a document affirming that it has the required financial, material, human-power and technical capacity.
- A childcare shall be registered by the accredited governmental body.
- A childcare shall be licensed by the accredited governmental body.
- A childcare shall be governed by regulations formulated by the accredited governmental body.
- A childcare shall be accountable to the accredited governmental body.

MoWA or the relevant governmental body is responsible to promote the application of the Guidelines by all concerned childcare organizations.

## 3. MANAGEMENT MODEL

### 3.1. Types of Services

Generally, the types of services to be provided by the childcare can be grouped into the following two categories: Basic Services and Psychosocial Services.

#### 3.1.1. Basic Services

**1) Education:**

The childcare shall have its own center for early childhood (pre-school) education either in the form of non-formal basic education or kindergarten within the compound of the childcare;

**2) Health, Sanitation and Hygiene:**

- The childcare shall provide health services to the children. The childcare shall, at least, have a first-aid giving room.
- The childcare shall provide the necessary hygienic training to the children starting at early years;
- The childcare shall make the necessary sanitary service available and encourage the children to contribute to the sanitation and tidiness of the site, homes, etc.

#### 3.1.2. Psychosocial Services

**1) Guidance and counseling**

The childcare shall provide guidance and counseling service to the children. Guidance and Counseling service in a childcare shall include: educational guidance; behavioral guidance and counseling; health counseling and group play therapy;

**2) Play, Recreation and Emotional Care**

The childcare should recognize that play is a fundamental instrument for relaxing children and creating pleasure in their daily life and fostering the cognitive and physical and emotional development of children;

### 3.2. Alternative Management Model and Recommendation

There are different management options, i.e. ways of management that IAIP may consider to adopt. Each of the management options has its pros and cons. The table below summarises three management options available for IAIP together with their advantages and disadvantages.

Management option	Advantages	Disadvantages
1. Fully self-implementing	<ul style="list-style-type: none"> <li>• Avoids the possibility of competing with other public child care for funding</li> <li>• Will give IAIP more autonomy to do what it sees as the right thing. With own money, IAIP can undertake interventions that it considers as appropriate, without being constrained by conditionalities</li> <li>• IAIP will have a chance to develop competence on market based development services</li> <li>• Gives IAIP opportunity for building internal capacity for management fully by its own</li> </ul>	<ul style="list-style-type: none"> <li>• Diverting from core area of focus</li> <li>• Implies allocation of sizable operating cost to run the child care</li> </ul>
2. Hybrid Model (Implementing in direct partnership with local authority)	<ul style="list-style-type: none"> <li>• Ensures survival of Childcare by enabling it to deal with Government's policy as well as maintaining partnership with local authorities</li> <li>• Acceptable to local authority due to direct involvement in implementation and enhanced quality assurance</li> <li>• Gives IAIP chance to work in partnership with local authorities, enhances its partnership approach</li> <li>• IAIP can help partner local authorities and become self-reliant to take care of own development</li> <li>• Gives IAIP a chance to buy time and engage its core business</li> <li>• Enables IAIP to maintain its current strategic priorities</li> </ul>	<ul style="list-style-type: none"> <li>• The existing organisational policies and systems of IAIP may not support the new model. 2</li> </ul>
3. Outsourcing to private sector	<ul style="list-style-type: none"> <li>• The private sector will be able to ensure quality of delivery</li> <li>• IAIP can have a strategic level engagement with private sector</li> <li>• Gives IAIP a chance to buy time and engage its core business</li> <li>• Enables IAIP to maintain its current strategic priorities</li> </ul>	<ul style="list-style-type: none"> <li>• The policy environment is not favourable for the private sector</li> <li>• It is a new territory for IAIP</li> <li>• Resistance from parents due to high tuition fee</li> </ul>

The recommendations of the assessment include the following:

- The choice of management options should be done based on rigorous assessment of the environment to understand the changes in the operating context and readiness of the IAIP, which will lead to a careful planning exercise.
- However, fully self-implementing model should be a longer-term goal of IAIP because this is a preferred model due to its sustainability as shown in the table above. Implementing this management model requires serious planning and preparations since it may divert IAIP from core area of focus.

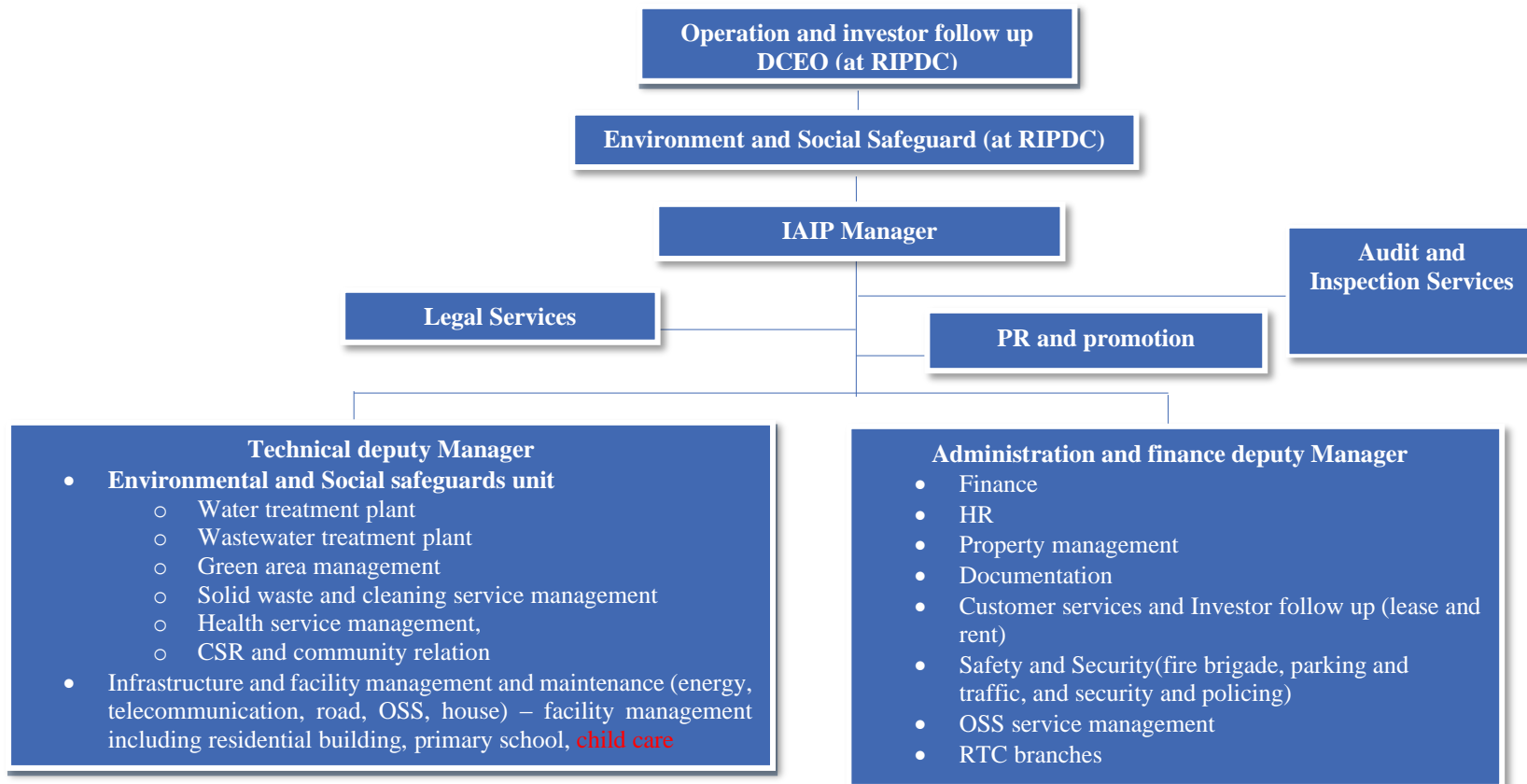
### 3.3. Proposed Organization Structure

A lean and efficient organizational structure (as depicted in Figure 1 below) headed by Manager/ Administrator, with the supporting staff has been proposed.

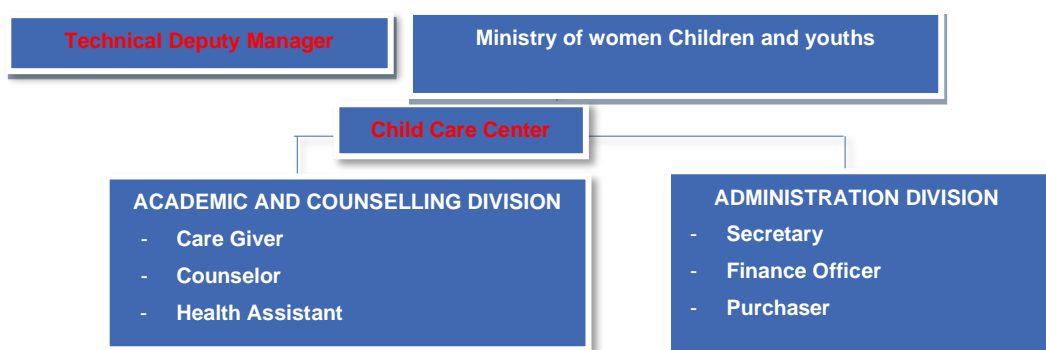
The Manger/ Administrator will be responsible for the overall operation and will be supported by Academic and Counseling Division, and Administration Division. Each Division is provided with its own supporting staff for the proper functioning of the division.

The proposed organizational structure of the IAIP showing its relationship with the concerned unit of RIPDC is given in Figure below while the detailed organizational structure of child care center is given in Figure 1





**Figure 1: Proposed Organizational Structure of Childcare Center**



### 3.4. Roles and Responsibilities

#### 3.4.1. Responsibilities of the Childcare Center

Childcare center shall discharge the following responsibilities:

- Provide care and support for children admitted into the center based on the objectives of the center;
- Make sure that the number of children accepted is properly balanced to the financial, material and human resource capacity of the center;
- Provide care to children with disabilities without any discrimination;
- Prepare internal child protection policy of the organization to make sure that every child in the center is protected from all forms of violence, abuse and exploitation;
- Work in collaboration with relevant bodies to ensure that the properties of children admitted to center are protected and their inheritance rights are legally protected;
- A childcare center must immediately report to the relevant authority any case of epidemic outbreak so that immediate interventions could be taken;
- A childcare center must keep records (data) about the profile of every child under their care and make sure that the files are kept under the strict confidentiality;
- Establish and strengthen networking among other institutions to promote experience sharing and collaboration;
- A childcare center has the obligation to submit bi-annual and annual report to the accredited and competent Regional Government authority;

#### 3.4.2. Responsibilities of Regional Authorities

The relevant Regional Authorities, with respect to a childcare such as Women and Child Affairs Office, Health Office and Education Office have the responsibility to:

- Follow up, monitor and evaluate the care offered to a child placed in childcare;
- Give feedback concerning the activities of the center based on the periodic reports and findings of monitoring and evaluation reports;
- Provide technical assistance to the childcare center (assign staff and facilitate the linkage to enhance the services for childcare);

#### 3.4.3. Parent Participation

- The childcare must establish a parent committee to provide a forum in which parents provide input and receive notice of any matters of interest or concern to the parents.
- A parent committee must be composed of at least 5 members representative of parents of children currently enrolled in a program; and representative of the staff who provide regular for children.
- A parent committee must meet at least 2 times a year.
- A parent of a child in care shall be permitted free access, without prior notice, throughout the center whenever children are in care, unless a court of competent

jurisdiction has limited the parental right of access to the child and a copy of the order is on file at the childcare.

- Opportunity shall be provided for parents to participate in the childcare’s program.
- The childcare must have a parent handbook to assist parents in making informed decisions regarding the care of their children.

### 3.5. Human Resource Requirement

#### 3.5.1. Staff

To provide an optimal caring environment, the childcare shall, at least, have the following manpower input:

- At least two staff persons shall be present in the childcare center when two or more children are in care.
- When children are grouped in similar age levels, the following maximum child group sizes and ratios of staff persons apply:

Age Levels	Staff	Children	Maximum Group Size	Total Number of Staff Required for the Maximum Group Size
Infant	1	4	8	2
Young toddler	1	5	10	2
Older toddler	1	6	12	2
Preschool	1	10	20	2

- A group of children enrolled in a childcare program must not be larger than the maximum group size specified in the table.
- In a childcare center, no more than 1 group of children may be located in a single room.
- In a childcare center, if a group of children includes children in 2 or more age ranges so that different staff-to-children ratios would otherwise apply, the staff-to-children ratio and the maximum group size applicable for the age range of the youngest child present in the group must be applied to the group.
- Children on the childcare center premises shall be supervised by a staff person at all times. Outdoor play space used by the childcare center is considered part of the childcare center premises.
- Each staff person shall be assigned the responsibility for supervision of specific children. The staff person shall know the names and whereabouts of the children in her assigned group. The staff person shall be physically present with the children in her group on the childcare center premises.

#### 3.5.2. Minimum Competency Level

- (1) **Manager / Administrator:** The manager / administrator shall have at least his/her first degree in sociology, psychology, or other related fields of study with, at least, two years of relevant experience.
- (2) **Health assistant:** A Health Assistant shall, at least, have a certificate with a minimum experience of two years in the area.
- (3) **Counselor:** A Counselor shall, at least, have his/her first degree in psychology with a minimum experience of two years in the area.
- (4) **Care Giver:** A Care Giver should complete at least grade six and shall have at least a three months relevant training and a minimum experience of one year.

The detail roles and responsibilities of the childcare workers are attached in **Annex II**.

## 4. STANDARD OPERATING PROCEDURES (SOP)

### 4.1. SOP for Enrollment

To enroll children into the childcare, parents will complete the registration form (**see Annex III**) at the center. Upon the first visit, parents will need to complete a registration form with the following information:

- Immunization Records
- Statement of Child's Health from a health-care professional
- Emergency contact information
- Contact information for persons other than a parent to whom the child may be released
- Contact information for the child's physician or an emergency-care facility
- Special care needs and allergy information
- Contact information of school for school-aged children

In addition, parents will be required to sign the registration form, which states they have received and agree to the Operational Policies and Procedures as well as authorization to obtain emergency medical care.

### 4.2. SOP for Education

- The childcare shall provide all the necessary educational materials to the children;
- The childcare shall offer supportive educational services to children with educational difficulties;
- The counselor should follow up the educational development of the children regularly;
- The counselor should prepare a quarterly report on the educational development of the children and submit the same to the administration of the childcare;
- The childcare shall have a reading room, preferably with necessary reading materials/books;
- The childcare should encourage and motivate children to perform better in their education.

### 4.3. SOP for Health, Sanitation and Hygiene

The childcare shall be carefully designed to ensure it is a safe, comfortable environment that will accommodate the abilities and needs of all children. Childcare Centre staff will provide:

- A clean, well-maintained, safe environment with nutritious food for snacks and lunch
- Opportunities for learning how to take care of their bodies and develop self-help skills
- Opportunities for both rest and exercise with indoor and outdoor activities daily
- Welcome mothers to breast-feed their child and provide support for breast-feeding.
- Provide a comfortable and relaxed environment for the children and parents
- Encourage children to eat a variety of foods but be sensitive to individual food preferences and cultural preferences.
- Inform parents of any significant changes in the eating habits of their child.
- Model healthy attitudes towards food and meal times.
- Model healthy attitudes towards washing hands before and after meals and brushing teeth after eating.
- Discourage candy, gum, pop or other "junk food".
- All babies will be held during bottle feeding.
- Toddlers are required to lie down or sit on the couch when they have a bottle.
- Staff will discard any unused liquid in bottles or cups to prevent the spread of germs.
- Staff will allow children time to eat and drink at their own pace.
- Staff will respect the parent's decision as to when and what solid foods will be introduced, while working within the nutrition policy of the country.

#### **4.4. SOP for Guidance and Counseling**

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Positive guidance techniques will be used to encourage appropriate behavior. They include:

- Establishing clear, consistent, and simple limits
- Stating limits in a positive way
- Focusing on the behavior, rather than on the child
- Stating what is expected, rather than pose questions
- Providing real choices
- Allowing time for children to respond to expectations
- Reinforce appropriate behavior, with both words and gestures
- Encourage children to use the teachers as a resource when they cannot resolve issues on their own.

Inevitably there will be occurrences of inappropriate behavior. It is at these times that there may be a need for intervention by the care giver. The following intervention strategies, or combination of the strategies, will be used to help ensure that guidance is supportive, rather than punitive.

- Gain attention in a respectful way
- Remind children of more appropriate behavior
- Acknowledge feelings before setting limits
- Redirect or divert when appropriate
- Model problem-solving skills
- Offer appropriate choices
- Use natural and logical consequences
- Provide opportunities for children to make amends. Rather than demand a superficial apology, encourage genuine opportunities for children to restore relationships after an incident of hurt or harm.

Any serious concerns will be discussed with the family so that work together to encourage appropriate behavior.

#### **4.5. SOP for Play, Recreation and Emotional Care**

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The childcare will take the children off premises for walks or field trips.

- Staff/child ratios will be maintained on all walks or field trips.
- First-Aid Kit and emergency cards with updated information and photo of child will be brought on all field trips or walks.
- At least one staff member present with the children must hold a current, valid first aid certificate.
- Access to a working telephone must be available within 5 minutes walking distance of the field trip site.
- An emergency plan must be developed prior to field trip. All staff and volunteers in attendance at the field trip must be familiar with the emergency plan. All emergency plans should contain the telephone numbers of parents, ambulance, hospital and doctor, as well as what actions are to be taken in the event of an emergency occurring.
- A signed informed consent form must be received from the parent/guardian of the child prior to any field trips.

## 5. REPORTING

### 5.1. Reporting Injury or Any Emergency

The manager shall immediately notify a child's parent on telephone and send a written report to the IAIP management within three hours if one or more of the following occurs:

- Inpatient hospitalization or emergency room treatment of an injured / ill child receiving care at the child care center;
- The death of a child receiving care at the child care center;
- A child care center fire that requires the service of a fire brigade;
- A child receiving care in the child care center is lost or missing from the child care center; and
- A child receiving care in the child care center is left unattended in the child care center when the child care center is closed.

The report shall include the following information:

- The name, address and telephone number of the child care center;
- The name, address and birth date of the child;
- The name and address of the child's parent or guardian;
- A description of the incident, including the date, time and location of the incident and the equipment involved;
- The name and telephone number of local authorities notified;
- The nature of the treatment;
- The name and address of the place where the treatment was received; and
- The required follow-up.

The staff person who prepared the report shall sign and date it. Copies of reports shall be kept in a file at the child care center.

### 5.2. Responding to Accident, Communicable Disease or Serious Incident

If an accident, communicable disease or other incident occurs that affects or could affect the health, safety or well-being of a child attending a child care, the Manager of childcare must do all of the following:

- Immediately secure any necessary medical assistance;
- Notify the parents of any child affected;
- Prepare an incident report, which must include all of the following:
  - ✓ A summary of the incident and the action taken by the childcare staff or care provider;
  - ✓ The signature of each staff member and care provider involved; and
  - ✓ The signature of a parent of each child affected by the incident.
- Place a copy of the incident report into the file of each child affected by the incident.

If a serious incident occurs, the manager must notify the IAIP management within 24 hours; and forward a copy of the incident report no later than 2 days after the date of the serious incident.

## 6. COST RECOVERY STRATEGY

The first step before starting operation of childcare is to determine whether the expenses match the income. If not, it will be necessary to lower the costs or reevaluate the market. If additional monies cannot be raise, decide where to cut costs. For example, cut salaries or fringe benefits since they consume a large part of costs. However, these are important in attracting and maintaining a well-qualified staff. Also, reducing staff may place the childcare out of compliance with licensing requirements and standards of quality.

On the other hand consider increasing fees or tuition in addition to looking for other sources of revenue. Assess and determine what parents can afford to pay and what seems to be the going rate at similar centers.

Remember, if you lower a fee you have to make it up in other fees. Therefore it is recommended to cover the cost in partnership with enterprises. Hence, IAIP is responsible to provide the minimum physical structure requirements and a reasonable amount of monthly fee shall be collected from enterprises to cover the fund of salary payment and purchase of materials, any possible budget shortage such as facility maintenance, necessary material for the services, contract employment, etc.

## 7. ANNEXES

### Annex I: Physical Structure Requirements

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#### 1. Location

- The location of the childcare shall take into account the availability and accessibility of the following infrastructures:
  - a) Potable water supply;
  - b) Road (either a dry or all weather road);
  - c) Electric power or generator;
  - d) Preferably telephone communication;
  - e) Education facilities;
- Should be free from dangerous environments or settings with potential hazards (areas susceptible for recurrent dangers) such as military camps, war-prone areas, places with dangerous wild animals, flood-prone areas, polluted areas, high traffic areas, etc.;
- Childcare should be situated within the premises of the community where the children can get access to social services (schools, hospitals, clinics, market places etc.) with reasonable distance.

#### 2. Compound and Facilities

- A compound of a childcare shall have adequate space relative to the number of children under its care;
- A compound of a childcare shall be free of hazardous situations and elements. Thus, a childcare shall be:
  - a) well fenced to protect the children from intruding threats;
  - b) free from chemical, noise, air, pollution, etc.;
  - c) free from hazardous physical structures like wells, swamps, unprotected ponds, open sewers, deep ditches, etc.;
- The compound of childcare shall have service giving buildings/rooms and administrative building/rooms and facilities;
- The buildings of the service and administration rooms shall be approved by relevant authority and shall be appropriate enough to address the mobility needs of children with disability;
- A service giving building of a childcare shall, at least have:
  - a) A counseling office (therapy room);
  - b) At least one hall/dining room;
  - c) One first-aid room;
  - d) Recreational facilities (in-door and out-door facilities);
- An administrative building of a childcare shall, at least, have:
  - a) One administrator's office;
  - b) One record office;
  - c) Finance office;
  - d) Storeroom;
  - e) Meeting room.



## Annex II: Job Description of Childcare Workers

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### 1. Duties And Responsibilities of Manager / Administrator

#### Job Summary

Under the direction of the IAIP/ RTC Manager, manages the day-to-day operations of the Childcare Center. Participates in the development, recommendation, and administration of policies, procedures and processes in support of Center operations.

#### Typical Duties and Responsibilities

- To take day to day responsibility for children and staff
- To ensure high standards of care at the center
- To develop curricula in line with the policy
- Ensure a good standard of hygiene
- Attend meetings and undertake training as required
- Revise policies and procedures as required
- Adhere to Child Protection Policy of the service and report any concerns
- Prepare long term, medium term and short term plans
- Manage a budget and maintain accounts
- Maintain all records as required by supervising authorities
- Represent the service during Inspections
- Network with appropriate statutory and voluntary agencies
- Ensure the center is adequately insured and all safety equipment are maintained and regularly serviced i.e. Fire equipment etc.
- To develop ongoing positive relationships with parents
- To facilitate regular staff meetings
- To co-ordinate recruitment, induction, appraisal and training requirements for staff
- Be able to take charge and direct children and staff in case of an emergency
- Maintain strict confidentiality, any breach of confidentiality about children or their families will constitute gross misconduct
- Perform any other reasonable duties that may be assigned from time to time

### 2. Duties And Responsibilities of Health Assistant

#### Job Summary

Preventing the spread of infectious diseases is a primary goal of a daycare center's health assistant, but she also has the task of promoting health and safety with the children, their families and the childcare center's staff.

#### Typical Duties and Responsibilities

- Provides onsite assessment of a sick or injured child's needs. That information is relayed to the appropriate primary health care provider or emergency room -- as well as to the parents.
- Tracks each child's medical records while they are enrolled.
- Maintains records of each child's physical development.
- If the childcare center has children with special needs, the health assistant supervises any accommodations necessary to serve those children.
- Provides training to the center's staff on things such as sanitary diaper changing and proper hand washing procedures.
- Monitors the facilities for health issues and cleanliness.
- Keeping the center's staff and parents informed about health care with emphasis on preventative care.

### **3. Duties and Responsibilities Of Counselor**

#### **Job Summary**

Childcare counselor creates a positive and safe growth environment for children in childcare center. He monitors children's development and keep detailed records of their physical, mental, and emotional growth.

#### **Typical Duties and Responsibilities**

- Supervise children, both individually and in group settings.
- Ensure kids are following rules and provide discipline as needed.
- Create activities and lessons for the children.
- Monitor kids' behavioral, mental, and physical progress. Keep detailed records of this progress and analyze them to create individualized strategies to help children continue to grow and learn properly.
- Report on children's progress to supervisors, school administrators, and parents.
- Create daily schedules for the children. This often involves planning activities, learning plans, and field trips.
- Response for children during emergency situations. As such, they need to be prepared to lead children away from dangerous situations, intervene during fights, and deliver first aid.

### **4. Duties and Responsibilities Of Caregiver**

#### **Job Summary**

Childcare caregiver attends to the basic needs of children, such as dressing, feeding, and overseeing play. They may help younger children prepare for kindergarten or assist older children with homework.

#### **Typical Duties and Responsibilities**

- Supervise and monitor the safety of children
- Prepare and organize mealtimes and snacks for children
- Help children keep good hygiene
- Change the diapers of infants and toddlers
- Organize activities or implement a curriculum that allows children to learn about the world and explore their interests
- Develop schedules and routines to ensure that children have enough physical activity, rest, and playtime
- Watch for signs of emotional or developmental problems in children and bring potential problems to the attention of parents or guardians
- Keep records of children's progress, routines, and interests

## Annex III: Registration Form

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Child's Name: \_\_\_\_\_ Nickname: \_\_\_\_\_

Birthdate: \_\_\_\_\_ Age: \_\_\_\_\_ Sex: \_\_\_\_\_

Child's address: \_\_\_\_\_ Home phone: \_\_\_\_\_

With whom does the child reside? (Mother, father, guardian) \_\_\_\_\_

Father's name: \_\_\_\_\_ Father's work number: \_\_\_\_\_

Employer: \_\_\_\_\_ Occupation: \_\_\_\_\_

Mother's name: \_\_\_\_\_ Mother's work number: \_\_\_\_\_

Employer: \_\_\_\_\_ Occupation: \_\_\_\_\_

Names & ages of brothers and sisters: \_\_\_\_\_

Other family members living at home: \_\_\_\_\_

Child's favorite play activities: \_\_\_\_\_

Does the child have any allergies or handicaps, such as speech, hearing and/or motor coordination difficulties? Explain: \_\_\_\_\_

Has the child attended pre-school before? \_\_\_\_\_ If yes, where? \_\_\_\_\_

What learning experiences do you want your child exposed to during the pre-school experience?

Be specific. \_\_\_\_\_

Please add additional comments related to behavior that will enable us to know your child better: \_\_\_\_\_

Approved:

\_\_\_\_\_  
Child Care Instructor

\_\_\_\_\_  
Date

\_\_\_\_\_  
Principal

\_\_\_\_\_  
Date



PRO  
SEAD



# Primary School Management Manual for IAIP



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## ABBREVIATIONS

<b>IAIP</b>	Integrated Agro-Industry Park
<b>DGP</b>	Gross Domestic Product
<b>E.C</b>	Ethiopian Calendar
<b>ESDP IV</b>	4 <sup>th</sup> Education Sector Development Plan
<b>GEQIP</b>	General Education Quality Improvement Program
<b>MOE</b>	Ministry of Education
<b>IDCJ</b>	International Development Center of Japan Inc.
<b>JICA</b>	Japan International Cooperation Agency
<b>PTSA</b>	Parent Teacher and Student Association
<b>RIPDC</b>	Regional Industrial Park Development Corporation
<b>CGIS</b>	Corrugated and Galvanized Iron Sheet
<b>SIP</b>	School Improvement Program
<b>SOP</b>	Standard Operating Procedure
<b>WEO</b>	Woreda Education Office

## OPERATIONAL DEFINITION OF TERMS

<b>Primary school</b>	a school that gives education to children (grades 1-8) in two cycles
<b>First Cycle</b>	a school that gives education to children (grades 1-4)
<b>Second Cycle</b>	a school that gives education to children (grades 5-8)
<b>Eco industry park</b>	is an industrial park in which businesses cooperate with each other and with the local community in an attempt to reduce waste and pollution, efficiently share resources (such as information, materials, water, energy, infrastructure, and natural resources), and help achieve sustainable development, with the intention of increasing economic gains and improving environmental quality.
<b>Educational Standard</b>	Inputs and processes required for a primary school at each grade level to achieve expected out puts set by the MOE
<b>School Improvement Program</b>	Ensuring that schools achieve minimum standards which define the requirements to support effective teaching and learning in a healthy and safe environment; and supporting community-based school management and decision making
<b>Parent, Teacher and Student Association (PTSA):</b>	Is a formal organization composed of parents, students and teachers that are intended to facilitate parental participation and school activities
<b>Accident</b>	is an unplanned event that causes injury to persons, damage to property or a combination of both
<b>Incidents</b>	An unexpected event that may result in property damage, but does not result in an injury or illness
<b>A near miss</b>	is an unplanned event that does not cause injury or damage, but could do so
<b>School activities</b>	includes excursions, educational visit, and sport events conducted by Kebele, Woreda, Zone, Region and Federal concerned authorities

# 1. INTRODUCTION

## 1.1. Purpose and Scope of the Manual

The Integrated Agro-Industry Park (IAIP) is equipped with primary school that serve for the community of the park and neighbours in order to realize the right for education (Sustainable Development Goal 4) and meet the standard 2kms distance from primary school to children's residences. Having primary school within the IAIP is also a standard facility to meet the Social Corporate Responsibilities of the eco Industry Park.

Given this requirement of the eco industry parks, this manual is therefore a tool for the management and operation of primary schools of the target parks. The manual is designed in line with federal and regional legislative requirements in Ethiopia. It supports the provision of sound teaching and administrative practices in the school environments.

Establishing standardized primary school within the industrial parks will facilitate creating access to quality primary education to children in the areas so that employees will be attracted to work in the parks. Furthermore, standardized operation of primary school in the parks will create positive image among the local community and help firms in the parks to execute their Social Corporate Responsibilities. In the end, conducive environment for workers and community through providing standardized primary education services increases access to labour inputs which will in turn attracts foreign direct investment in the parks and beyond.

## 1.2. Updating Frequency and Procedure of the Manual

This manual shall be updated every three years. Any change request should be raised by the user of these manual including Head Teachers, Students, Teachers, Community Members, PSTA members, Board of Directors and WEO. Request should be submitted using format Appendix 2.1 and approved by Board of Directors.



## 2. REVIEW OF INTERNATIONAL & LOCAL STANDARDS, NORMS

The constitution of the Federal Democratic Republic of Ethiopia adopted in 1995 stipulates that the state has the obligation to allocate an ever increasing resources to provide to the education and other social services (article 41 (4)); to the extent the country's resources permit, policies shall aim to provide all Ethiopians access to education (article 90); and national standards and basic policy criteria for education shall be established and implemented (article 51 (3)). In 2020/2021 fiscal year, Ethiopia has allocated 25% of its annual budget and 4% of its GDP to the education sector (Ethiopian Broadcast Corporation, April, 2021).

In addition, Proclamation No.41/1993 enacted to define the powers and duties of the central and regional executive organs stipulates that the Ministry of Education (MOE) has the authority of designing national education policy and strategy (JICA, IDCJ) 2012, P-6). Ethiopia's constitution and proclamations indicated above are in line with UN Sustainable Development Goal 4 which focuses on ensuring inclusive and quality education for all and promote lifelong learning by 2030 as education enables upward socioeconomic mobility and is a key to escaping poverty (<https://www.un.org/sustainabledevelopment/>).

Based on its mandates, MOE designed National Education and Training Policy along with National Education Sector Strategy. The main focus areas of these documents are issues related to relevance, quality, access, efficiency coverage nature of the education system. Each of the above-mentioned characteristics of the education system as stipulated in the documents is taken the focus areas of the Education Sector Development Plan. Currently, the education sector plan has reached to the 5<sup>th</sup> version. Each of the education sector plans has five years implementation period where quality of education is at its central point of discussion in the current version.

To follow up and monitor the implementation of the policy, strategy and plan, the MOE has designed a national standard document for schools (2001 E.C p 2).The national standards set requirements for primary education (2001 E.C) and other levels to guide the education reform agenda of the country. In this respect, 2001 E.C education standard document sets three levels for the formal education system- i.e. pre-primary, primary and secondary school levels. To this end, primary school level which is the focus of this manual is further classified in two cycles where from grades 1 to 4 are the first cycle and grades 5 to 8 are in the secondary cycle. These two cycles are set to be completed within 8 years period and involve children aged 7 to 14 years old.

The Ministry of Education also sets applicable norms, standards and minimal requirements for primary schools including;

- The Ethiopian school system consists of eight years of primary education, divided into two cycles of four years (4+4). Education is technically compulsory for all children until grade eight.
- The core curriculum is standardized nationwide, but there are some variations, including the language of instruction, at the local level. The subjects taught in the first stage (grades 1 to 4) are their respective mother tongue language, English, Mathematics, Environmental Science, and Arts and Health and Physical Education.

The second stage (grades 5 to 8) includes Civics, Integrated Science, Social Studies, Visual Arts and Music, Biology, Chemistry and Physics in higher grades.

In order to improve access to quality education, the Government of Ethiopia has recently focused on improving school-based management through the devolution of education decision-making to school level. To achieve this objective, it has promoted the roles of various education stakeholders in decision-making. Specifically,

- It has strengthened the relationship between WEO and the schools through inspection and capacity-building schemes.
- The recent education programmes such as ESDP IV, GEQIP and SIP give more power to head teachers and administrators to coordinate the roles of communities, parents and local administration in school decision-making.
- The policy emphasizes the importance of the participation of communities, parents, students and teachers through PTSA for the improvement of critical decision-making at school level.
- As a key local administration unit working closely with the community, Kebele administration is considered as one of the key stakeholders for enhancing school-based management.
- The participation of students in education management is also a way of promoting participatory decision-making at school level.

The school management should have the culture of using standard manuals in managing the school activities and processes. Using these standard manuals improve efficiency of the school management, community participation, financial management, policy and strategy implementation and other standards procedures. In the end, the school provides quality education for its students.

## 3. REQUIRED SCHOOL FACILITIES

### 3.1. School Infrastructure (Compounds and Buildings)

In order to facilitate students learning, suitable buildings and compounds based on the size of students, teachers and school materials are needed to bring required behaviour change of the students in the teaching-learning process. As it is necessary to have age appropriate buildings for primary schools in line with the existing context of the locations and the capacities of actors who build the schools, primary school buildings may be constructed from cement, gravel, bricks and other materials available in the area.

According to the 2001 E.C standard, primary schools need to be constructed within 2 km distance from the students resident area and in an area where there are no or less obstructions for the teaching-learning process such as main roads, noise, bad smell, liquor houses and hotels, high traffic areas, rivers and rugged topographic areas, market places, and factories among others. Schools should also be away from areas where drugs are traded or used and adult videos show houses that negatively affect student personalities.

Based on the local context, school compound can be built from stones and bricks where it is fully fenced with harmless barbed wire and woods. It should have classroom and offices for administration and other purposes designed and equipped as appropriate to its respective functions. The compound also should have appropriate walk-ways for the school community, sufficient car parking, clean drinking water, sufficient space for outdoor games and lessons that need to be provided outside the classrooms. In general, the compound needs to be comfortable and appropriate to the teaching-learning and administrative functions in the compound.

In terms of area size of the school compound, the 2001 E.C standard document states that the size of the school compound is determined by the number of classrooms and the size of the student population while the number of classrooms is determined by the number of students in the school. The school compound size ranges from 15,000 to 25,000 m<sup>2</sup> depending on the availability of land (Standard, 2001 E.C). It should have clean latrine, access for water, pedagogical centre, clinic, first aid kit and playground. The primary schools have compounds which accommodate first cycle (grades 1-4) and second cycle (grades 5-8) separately or one compound that accommodates the two cycles (grades 1-8).

### 3.2. Student-Classroom Ratio

According to 2001 E.C, standard classroom area size for primary schools ranges from 50-56 m<sup>2</sup>. The standard document also states that one primary school should not accommodate more than 2000 students as students beyond this size have negative impact to ensure education quality. One first cycle (grades 1-4) should have 4 classrooms which include one principal's office, one teachers' office, one store room, latrines (2 for teachers, 4 for students-sex disaggregated), one pedagogical centre (centre of excellence) room, one reading room, one general science room, one guards' room, rooms for special needs education, speech counselling room, one first aid room and one janitors room as minimum standards for first cycle primary school. These classrooms should be furnished with appropriate facilities such as chairs, tables, benches, shelves, boards, dustbins and others as appropriate.

Second cycle (grades 5-8) must have a minimum of 8 classrooms which include one principal's office, one secretary office, two teachers' rooms, one first aid room, one store room, one janitors room, two sex disaggregated toilet rooms for staff, one reading room, one room for book store, a room for science teaching, one general science room and one pedagogical centre (centre of excellence) room, 8 sex disaggregated toilet rooms for students, one guards room, two rooms for special needs education and one room for speech counselling are the minimum standards for a second cycle primary school. The classrooms should be furnished with appropriate facilities such as chairs, tables, benches, shelves, boards, dustbins and others as appropriate.

The 2001 E.C standard document indicates that student-classroom ratio is 1 classroom for 50 students in the primary cycle (grades 1-4) while 1 classroom is for 40 students in the second cycle (grades 5-8). Student –textbook ratio is one to one while teacher-textbook and brail ratio is one to one too. Each student needs to have one textbook for each subject. In case there are students with special needs in a classroom, the number of special needs students must not exceed 5 and in a classroom for formal education that need special education, one teacher teaches not more than 10-20 children among all his/her classroom student.

### **3.3. Qualifications of Staff**

For the first cycle (grades 1-4), the principal needs to be diploma holder and should take courses for principals. Unit leader needs to be a diploma holder. School teachers need to be diploma holders and took necessary teachers training courses. Guards and janitors need to be grade eight complete. In a primary school, there needs to be a librarian who is a diploma holder in Library Science while there should be a secretary who is a diploma holder in Secretarial Science.

For the second cycle (grades 5-8), the principal and the vice principal need to be first degree graduates in school administration and planning. Vice principal is hired for those schools which have student population over 1000 students. Unit Leader needs to be diploma holder in any field of study. Teachers need to be diploma holders in the field they are assigned to teach. Storekeeper needs to be a diploma holder in property administration and logistics. Guards, messengers and janitors need to be grade eight complete. For special needs education, teachers need to be diploma holders in special needs education and speech counsellor needs to be diploma holder in Language Studies and has training in special needs education. Areas of studies that primary schools focus on include Languages, Natural Sciences, Social Sciences, Mathematics, Health and Physical Education, Music and Drawing.

### **3.4. School Curricula Content and Pedagogical Materials**

The school curricula and syllabi are updated periodically at five years interval with the aim of ensuring the relevance of its contents in contemporary Ethiopia. As can as possible, pedagogical materials are expected to be fulfilled using local materials and other standardized materials in cooperation with different development partners and utilized as intended.

The curriculum is characterized as competency based. It follows teacher directed but student centre approach. In each school there is a pedagogical centre as a resource for pedagogical materials. A successful system also uses technology to broaden access to knowledge and to improve student learning and learning outcomes. In general, teaching- learning is guided by;

- The National Education Curriculum
- Subject Syllabus

- Teachers Guides and Reference Books per grade level
- Students Textbooks
- Education Calendar

### **3.5. Teaching Methodology**

One of the challenges identified in the schools is inadequate performance of students as indicated in the standard documents (2001 E.C). There are factors for poor performance of the teaching learning process which include but not limited to; lack of active and coordinated engagement among parents, students and the school in the teaching-learning process and lack of using attractive and participatory teaching techniques. To this end, school management and teachers need to create conducive atmosphere for student-centred teaching methods. For effective teaching and learning process, students, parents, the school (principals, teachers and other school staff) and local community should play their respective roles.

Students should be self-motivated to do what the teachers give them both in the school and outside the school. Parents should support their children and the school in areas that improve their children performances through improving the school management and facilities. The school should also play its roles of creating partnerships with the local community and regularly discuss issues that require community engagement to improve school. In order to improve the quality of education, the school could use support programmes and materials such as radio and television programmes. These programmes could increase access to better qualified teachers, teaching materials and teaching techniques for students.

### **3.6. Beneficiaries/Users of the Primary School**

The primary school is intended to provide teaching-learning services to any IAIP worker's children living within the park compound whether s/he is local staff or expatriate staff as far as the worker has accepted the requirements of the school. As the school is under the Woreda Education Office, it needs to use Ethiopian national curriculum and associated syllabus. It shall also evaluate its students using standard Ethiopian National Examinations at each grade level. Until the workers in the IAIP will be provided residential houses within the IAIP, they are entitled to enrol their children into the park's primary school.

### **3.7. Method of Evaluation of Student Performance and Learning Outcomes**

According to the 2001 E.C standard document, one of the key areas that the Ethiopia education policy takes into account is student performance evaluation. The standard document indicates that it is one of the key tools to identify whether students have acquired the knowledge and skills set for that particular grade level and effectiveness of the teaching-learning process employed. With this respect, there are standardized national exams and learning assessment result at grade 4 at school cluster or Woreda level to ensure whether students are learning or not.

Student promotion is based on continual assessment during the first phase, while term-end examinations are introduced in the second phase. At the end of grade eight, pupils sit for a region-wide external examination and are awarded a Primary School Leaving Certificate, which is a prerequisite for admission into secondary school. Students who fail the exams need to repeat grade eight before they can retake the standard test.

## 4. ADMINISTRATIVE TOOLS

Formal education is a planned teaching provided for students based on their ages, maturity level and preparedness for learning. To this end, education program needs to have the following management tools including;

- Education calendar
- Distribution of teaching schedules(periods)
- Roles descriptions of school management
- Allocation and use of time in the school
- Special needs education program
- Full day education program
- Extracurricular programme
- Subjects that need special attention
- Teaching–learning guidelines

In addition to the above operation and teaching –learning guidelines, the school needs different manuals for effective management of the school activities. These manuals, among others, include;

- General education management organization and community participation Handbook( Blue Book)
- School Management and Administration Handbook
- General Education and Training Policy Document
- Proclamation on roles and responsibilities of national and regional education management organs of the government ( Proclamation No.41/85)
- Education Excellence Centers Operating Manual
- School Grant Manual
- National Girls Education Strategy document
- Teacher Development Programme Manuals
- School Improvement Manuals
- General Education Quality Improvement Insurance Packages
- Civic and Ethical Education Programme Manuals
- Education Proclamation

## 5. TEACHERS' WORK ENVIRONMENT AND PROFESSIONAL DEVELOPMENT

As indicated in the qualifications section above, teachers are expected to take different pre-service and in-service trainings with the aim of enhancing their capacities so that students get quality education. Pre-service teacher training is currently getting focus and is intended to produce competitive teachers in different teachers colleges and universities of the country. In addition to pre-service training, in-service continuous professional development schemes are developed to enhance capacities of teachers for quality teaching–learning process.

When teachers are hired, there are different teacher recruitment guidelines and criteria to recruit teachers for different level of teaching. Furthermore, teachers are given the platform to engage in practicum schemes so that they can improve learning for themselves and delivery of quality education to students. Both the pre-service and in-services trainings are set to provide a safe, well-disciplined and caring environment for student learning. Having these levels of qualifications and trainings, teachers in primary schools are required to work for 206 days in a year and 40 hours (22.30 hours for teaching, 11.30 teaching preparation, 3 hours for extracurricular activities and 3 hours for different activities) in a week.

With the above qualifications and trainings, teachers have been given seven career ladders that ranges from beginner to senior lead teacher. To be promoted from one ladder to the next, teachers are required to demonstrate nationally established competencies in the teaching-learning process together with their engagement in extracurricular activities. Professional development also requires teachers' successful teaching learning process which consists of meaningful continuous learning for teachers and administrators that drives improved teaching, learning and school management practice.

## 6. STAKEHOLDERS AND THEIR ROLES

Each school management is composed of principals, teachers, parents, local community and education management professionals at different levels. In this regard, primary schools are led by Education and Training Board. The board consists of representatives from the community, the school (teachers and students), Woreda Administration, relevant representatives from parks, investors association, workers union. The board is led by Woreda Administration representative while the school principal serves as the secretary to the board. The board plays the following roles in the school management process including;

- In collaboration with the community, planning to support teaching- learning process and execute activities according to its plan.
- Involve communities in student learning and bring positive impact in student achievements
- Involve teachers voluntarily in school management and enhance feeling of ownership of the school by the teachers
- Incentivize successful teachers so that others will be motivated to work effectively
- At least twice in a year, the school management organizes discussion platform with parents and enhance ownership of the school by the community
- Discuss challenges with the community and make the community part of the solution, and
- Do related activities in collaboration with the community.

In addition to being involved in the board, the school may have Parents, Teachers and Students Association (PTSA). The PTSA will serve as a platform for parents, teacher and students to discuss management issues and make decisions and action that improve school management. In the end, these decisions and actions will enhance the teaching-learning process and improve student achievements. In supporting these management processes, the standard document (2001 E.C) presents detailed roles and responsibilities of parents and local communities.



## 7. STANDARD OPERATIONS AND MANAGEMENT

Operation and management of primary school involves six issues. These issues are grouped into six categories and provided with brief descriptions of them as follows:

### 7.1. School–Community Relations

The school as an organization cannot be divorced from its environment and this is the reason why the school head teacher has to develop and administer a culture for the participation of parents and the community in school affairs. Time must always be created to receive and interact with parents who visit the school or who are invited to the school. Such parents should be accorded the highest respect. Parents' complaints should be taken seriously and handled with respect and a sense of concern.

### 7.2. Curriculum and Instruction

This is the core area of the school system i.e., the essence of teaching–learning process. It is therefore crucial that the Head teacher/Principal should pay adequate attention not only to the education planning in line with the curriculum but also to the effectiveness of the execution of the instructional programs. Head teacher/Principal has to create conducive working environment for teaching and learning. In order to achieve successful results, principals need to apply dynamic leadership with the provision of material and instructional resources co-curricular activities. Principals should also employ innovative techniques that motivate students and teaching staff to use appropriate instructional methodology and good human relations.

### 7.3. Staff-(Teaching and Non-teaching)

This implies provision of personnel needed in carrying out program of instruction and non-teaching/administrative activities in the school.

The Head teacher/Principal in collaboration with department heads should provide appropriate motivation and encouragement to teaching staff members so as to retain them on the job and at the same time get them perform their tasks to the maximum benefits of the organization. It is important for the head teacher to provide orientation for newly employed staff and do a proper placement of these staff members so as to provide a source of satisfaction for them and thereby retain them on the job.

The Head Teacher with the Administration and Finance Head shall also be responsible to manage and motivate support staffs that provide services that compliment regular classroom instruction such as taking pupils inventory, organizing the pupils' provision of social workers and guidance counsellors to help the students in both their academic and social lines. There should be accurate data on pupils' enrolment, so that the well-being of the pupils would be taken care of. Support staff should also provide counselling services that help in minimizing student disciplinary problems in schools. The head teacher apart from the provision of the welfare services should also encourage co-curricular activities such as recreational activities, participation of students in different clubs and other community services.

## **7.4. Physical Facilities**

It consists of the school buildings, school grounds, equipment and other education facilities that are provided in the school to facilitate teaching-learning process. The head teacher must make sure that the buildings are kept safe and under good sanitary conditions for the students' use. Worn-out equipment, leaking roofs and chairs should be repaired. The whole school should be made attractive so as to boost the morale of the teachers and students in the school.

## **7.5. Financing and Business Management**

The primary school shall get budget for staff salaries, consumables, block grants and other allowable budget from the Woreda Education Office. The school shall also get grants from stakeholders and internal sources so that it will have sufficient finance to provide quality education for its students. The IAIP and other stakeholders may also avail finance to establish incentives such as housing for teachers so that the school may attract high calibre teachers which in turn attracts more workers to IAIP and motivates these workers to stay working in the park for more years. The school manager should prepare the budget, secure revenue for the school and use the fund at his disposal judiciously. He must also provide a proper accounting system for the money collected in the school. Fund raising and financial management for the school shall follow the financial laws, rules and regulations of Ethiopia.

To promote ownership of the primary school by school users and their parents, the school may raise limited money from students based on the workers paying capacity. This school fee from students may range from Birr 50 to 100 per student based on the parent's salary and number of children attending school. This shared responsibility will make the primary school affordable facility that give quality education for students.

## **7.6. General Duties**

The head teacher is expected to summon staff meetings in order to provide a forum for direct communication with both teaching and non-teaching staff. This is important to achieve teaching and learning goals of the school. The head teacher also has the responsibility for building the image of the school through functions like sporting events, literary and cultural displays by the school etc.

## 8. MANAGEMENT MODELS

There are three options for management and administration of the primary school. These are

1. Employing professional under the management of RIPDC
2. Outsourcing to private investor
3. Making it under the ownership of the Woreda Education Office

The first option is not preferred since it will hinder the park from focusing on its core business i.e., promoting to attract investors, create safe and secured industrial environment to investor and create B2B linkage among investors and farmers, among others. This will also raise the operating cost of the park as salary of professionals to be employed for the management of the day-to-day operation of the school as well as teachers and support staffs, stationary materials and other consumables for operation.

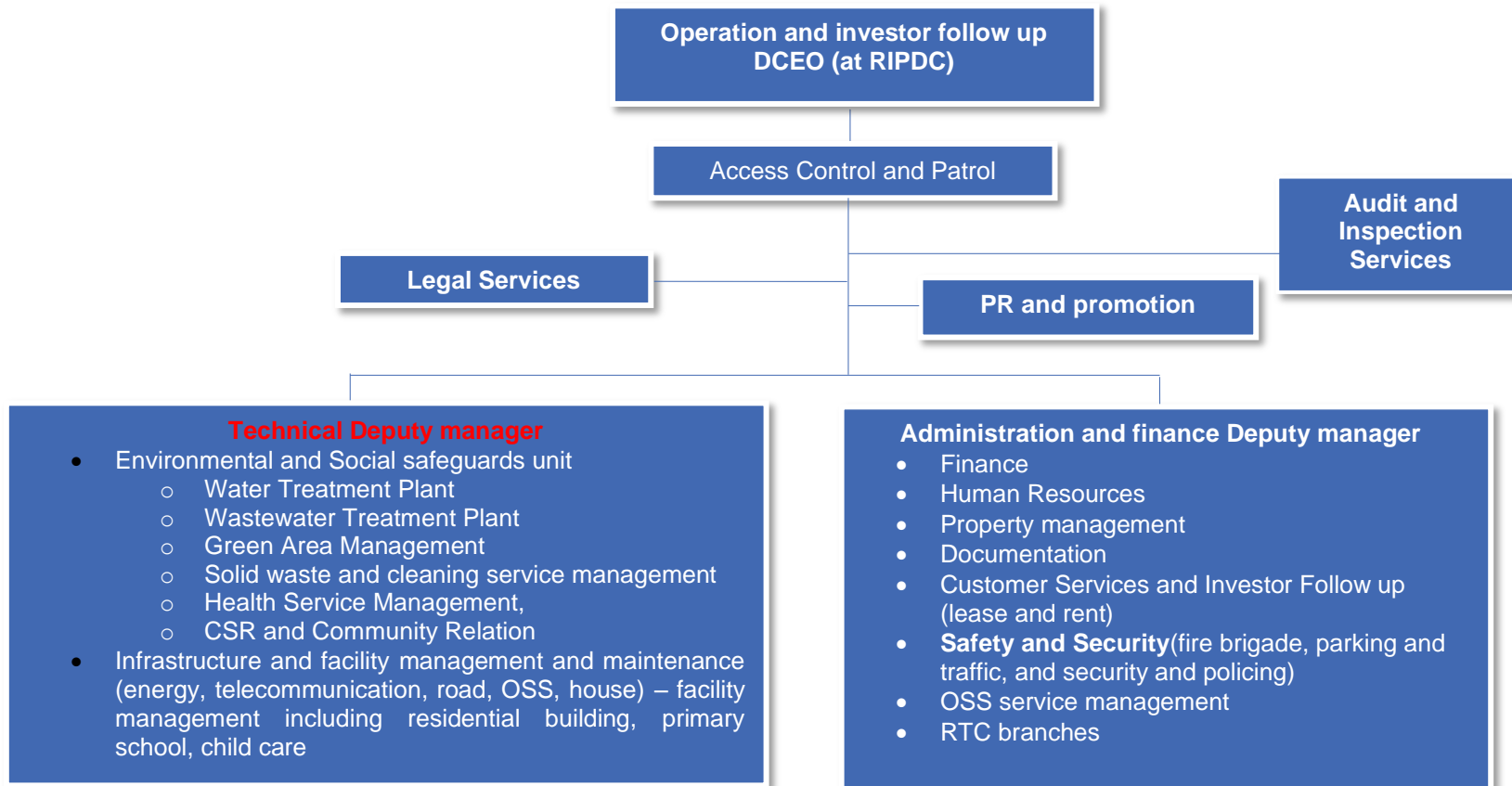
The second option is good from the point of view of creating income to the park and focusing in its core business. However, a private investor is a profit-making entity; it is difficult to achieve quality education at a lower service fee. Hence, either quality may be compromised or the services fees may be too high and not affordable to the park community.

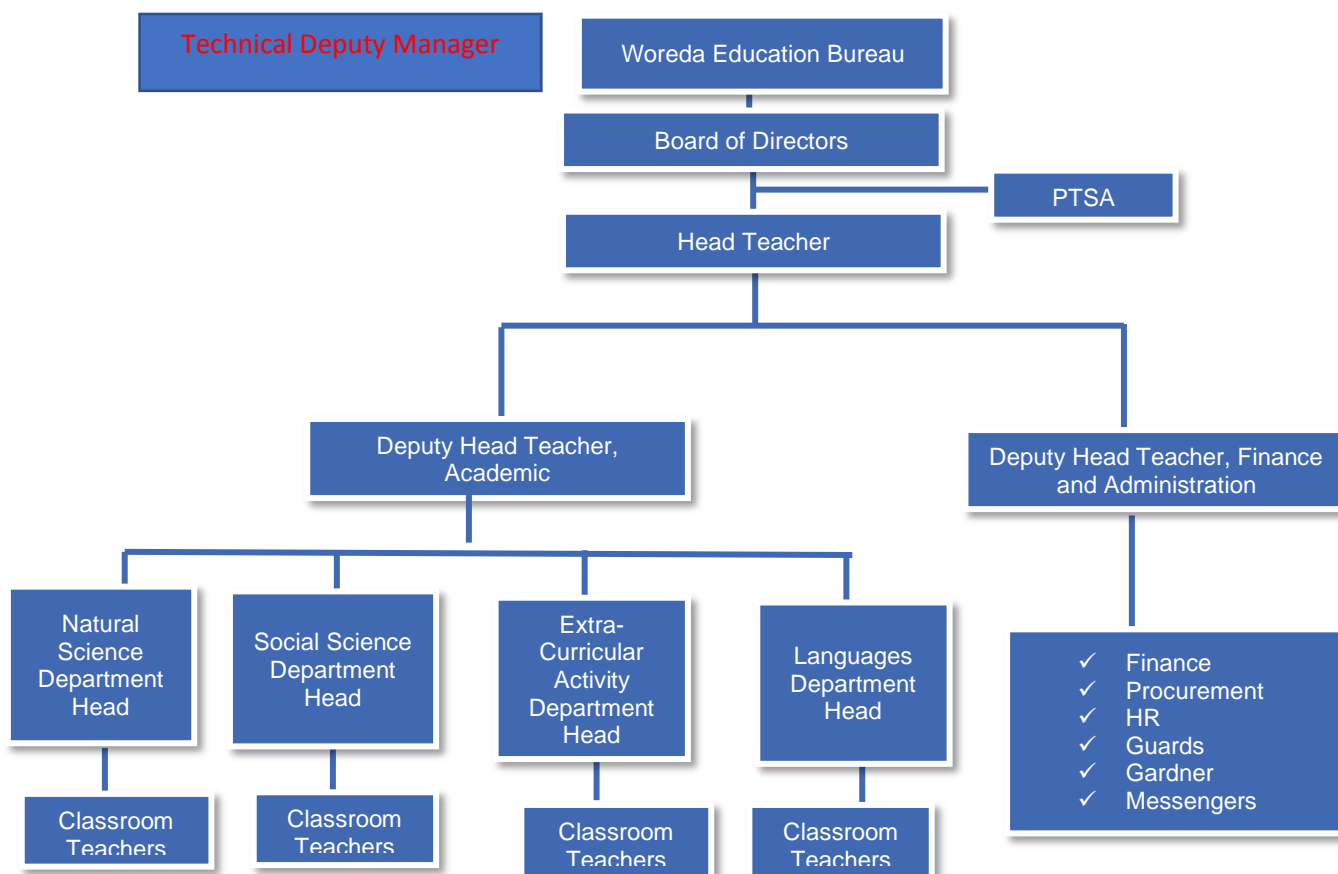
The third option shall be considered as the primary school in the park will one of the schools in the Woreda and shall be managed by WEO. The budget of the school including the salary of teachers and support staff, stationary, consumables, educational material etc. shall be covered by WEO. The management of the park represented by the Environment and Social Safeguard unit will be the member of the board of directors which will oversee and control the overall operation of the primary school. The expected budget shortage to employ high-profile teachers, overtime payment, equip the school with ICT and other facilities, and maintenance of the facilities could be covered through affordable fee from students.

## 9. ORGANIZATION STRUCTURE

The primary schools of the parks are considered as public school mandated to offer education to all children of the park and neighbouring community with little fee to support the operational expenses. Hence, the Woreda Education Office is responsible for providing budget employees salary payment and purchase of materials. With this in mind, the primary school organizational and management structure is given in Figure 9.1.

**Figure 9.1: Primary School Organizational Structure**





The main components of the operation and management organs of primary school are WEO, Board of Directors, Head Teacher/Principal, Deputy Head Teacher/Principal, Academic, and Deputy Head Teacher/Principal, Finance and Administration; PSTA (comprising parents, students, teachers, and representatives of the local community); and educational experts and supervisors working at Woreda and Kebele levels. These stakeholders are expected to take responsibility for problems and weaknesses that arise in schools, and they play leading roles in decisions making and effective implementation activities planned by the primary school.

### 9.1. Woreda Education Office

The WEO is given the role of supervising, monitoring and evaluating the activities of the schools, and of ensuring that the schools are provided with the necessary human, material and financial resources by the Woreda Education Office and other stakeholders. In this regard, WOE is responsible for the following activities including;

- Appoint the Head Teacher and the teachers and pay their salaries;
- Employ sufficient teachers to meet teacher-student ratios as set out in the Ministry of Education Policy;
- Provide adequate in-service training opportunities for principals and teachers;
- Provide available curriculum resources to enable teachers to meet national curriculum requirements and examination standards;
- Provide relevant stationery and teaching kits supplies;

- Provide regular information on Ministry of Education Policies and requirements;
- Provide training and support necessary to ensure the smooth operation of the School Management;
- Monitor progress on the commitments outlined in the Agreement including the submission of the Annual Report.

## 9.2. Board of Director

The Controlling Authority of the School is mandated to the Board of Director. The Board is responsible for performing activities on behalf of the industrial park and adjacent community. The Board of Directors comprises of seven members from IAIP management, PTSA, Woreda Education Bureau, Town/City Administration, Head Teacher, Classroom Teachers, Parents, etc. The roles and responsibilities of the Board of Directors are:

- Draw up the school plan and ensure that it is acted on;
- Appoint the Head Teacher, the teachers and other staff in collaboration with WEO;
- Ensure that the school fulfils its functions;
- Promote and facilitate contact between the school, the parents, WEO and the community and give all reasonable help to PSTA in its formation and its activities;
- Have overall responsibility for the school's finances. It must ensure the school has comprehensive insurance cover, keeps proper accounts, which may be audited by WEO. Must make annual accounts of the primary school available to WEO, management of IAIP and the school community;
- Ensure that child protection and welfare are considered in all of the school's policies, practices and activities. The Board must ensure that the Child Protection Procedures for the Primary Schools are fully applied by the school;
- Ensure the school has code of conduct.

## 9.3. Head Teacher

The Head Teacher/ Principal is appointed by the Woreda Education Bureau and the Board of Directors. Employment terms and conditions of the principal are governed by the Public Service Commission and Ministry of Education regulations. He/She must have the skills and knowledge to:

- Plan curriculum, instructional and assessment policies;
- Set targets and priorities for development;
- Build up a good learning environment;
- Nurture staff's curriculum and instructional leadership;
- Create curriculum space and time for teachers;
- Manage resources and enhance the transparency in the deployment of resources;
- Co-ordinate departments and support the autonomy of departments;
- Supervise the teachers and coordinates their work, inspire and motivates teachers positively;
- Represent the school in all its relations with third parties;
- Implements laws, regulatory decisions, circulars and official mandates of management executives and is responsible for compliance with them; s/he implements the decisions of the Board of Directors;
- Set up committees for examinations, collection of supporting documents, issuing of results and any other committees provided for the school's operation;
- Draw up evaluation reports on the teaching and administrative staff performance;

- Commend progresses and improvements made;
- Communicate effectively with staff, students and parents on the school's educational policy, objectives and work;
- Remove barriers;
- Share knowledge and experiences; and
- Prepare and communicate weekly, monthly, quarterly, biannually and annual reports to Board of Directors, management of IAIP and WEO.

#### 9.4. PTSA

PSTA has members from parents, students and teachers. Members from the community in PTSA will be those community members whose children learner in the primary school, and whose contribution to the school is recognised by the community. The PSTA meets at least once a term. The roles and responsibilities of PSTA are to:

- Monitor how the programs of the school are properly implemented according to the schedule and provide the necessary support to the implementation of the decision together with the school management;
- Involve in development of procedures and protocols to be used by the school for organization and coordination of its activities;
- Organize, promote and host academic events;
- Assist in improving students enrolment in the primary schools;
- Motivate students reduce or if possible avoid absenteeism and dropout. Find out solutions to reduce absenteeism and dropout through discussions with parents in collaboration with the Board and the Head Teacher. Invite parents in different meetings or conferences to strengthen parent- student relations and to find out solutions for absenteeism and dropout school and other problems;
- Help in maintaining disciplines in the schools;
- Ensure peaceful co-existence and cooperation between the primary school and the local community;
- Hold and support fund-raising activities to benefit the children and associations;
- Help to provide access to information and available educational resource to all the parents in the school.



## 10. FINANCING MECHANISMS

The primary school needs to have the necessary finance to facilitate the teaching –learning core and support processes so as to achieve the desired goal of creating access to quality education to its student community. The main sources of finances for the primary school are block grants and school grants provided by the government and its stakeholder in the education sector. In addition, the primary school can generate incomes from its internal sources; mobilize resources from the local community and individuals and institutions that have interest to support the primary school. The primary school should use standard financial procedures in the collection and use of financial resources as per the Government of Ethiopia financial expenditure laws and procedures.

The Park and its stakeholders may also create housing facility access to teachers and key administrative staff so that the school attracts high calibre teachers and be able to maintain these teachers for longer time. Creating incentives to teachers will improve the quality of education in the school and it builds the image of the school. This situation in turn will attract productive workers to factors in the Industrial Park.

## 11. PRIVATE SECTOR INVOLVEMENT

The primary school is managed by Woreda Education Bureau in accordance with a convention signed between RIPDC and WEO. As clearly indicated in the scope of service of operation and management of the primary school, the Woreda Education Office and management of the school will focus on the core business of the primary school i.e., teaching and learning activity. However, activities such as pest control, security, cleaning, garbage disposal, fire safety, maintenance and supply of education materials services could be outsourced as there are abundant private service providers in the market. These services also have adverse impacts to the quality of teaching learning process and they shall be outsourced. Services that can be outsourced to private service providers include;

- **Pest control** activities
- **Security service:** This service includes access control at primary school entrances to ensure that students, employees and visitors display proper gate passes or identification before entering the school compound, patrolling to ensure a safe and secure school environment, loss and waste prevention audit, logging the activity and the duties carried out during each shift in the log book, incident reporting and conducting prescheduled security review.
- **Cleaning service-** entrance stairway, corridor, lobbies, offices of building administration and support staff, external part of the building, and outdoor and grounds. In general cleaning service will keep the whole school compound clean and attractive the school community and visitors.
- **Garbage Disposal** that includes segregating garbage at source, collection and disposal at approved site,
- **Fire safety service** which includes regular inspections of fire extinguishers, recharging as needed, and recording of all maintenance work carried out,
- **Major Maintenance.** This service includes maintenance of components of the school infrastructure need to be maintained periodically, e.g., every 10 years or 25 years. For example, painting of the whole building once in 10 years, changing all the CGIS roofing once in 25 years.
- **Supply of educational and others materials.** comprising stationary, uniforms for teachers and students, learning materials, furniture and equipment, cleaning consumables, etc.

## 12. ACCIDENT AND INCIDENT REPORTING

This school procedure shall be followed when anybody experiences an accident, injury, near miss or dangerous occurrence either on school premises or during the course of school activities, such as on school trips.

Suitable information and training will be given to all personnel regarding accident management, emergency response and incident reporting. The first aid kit should be properly stocked, maintained and be accessible.

Reports of all accidents (staff, students, parents or anyone in the school grounds) must be entered in an accident register – see Appendix 8.1). Environment and Social Safeguard Unit of IAIP and parents or other contacts must be notified at the earliest opportunity of any accident (major or minor) to a student, other school community members and visitors. All accidents should be reported, recorded and reviewed. Unless the school is informed of incidents, it will be unable to identify what is wrong and take remedial action.

### 12.1. Accident/Incident Management

In any potentially dangerous accident or unforeseen event, the key priority must be people's safety and welfare.

Incidents and accidents should be managed in an appropriate manner to contain and eliminate any danger and minimise risks. Immediate first aid or emergency medical treatment should be sought where there are injuries. In all cases, appropriate first-aid should be delivered if needed. Students who are injured should be accompanied to the medical room. Any student with a head injury should be sent to a hospital for assessment.

If a danger or risk of further injury exists, staff or managers attending the incident should ensure that people are removed to a place of safety. Appropriate assistance should be called.

Incidents should be escalated to the senior leadership team, Head Teacher or Environment and Social Safeguard Unit of IAIP as appropriate to their perceived severity.

### 12.2. Accident Book

All accidents resulting in personal injury must be recorded in the accident book (see Appendix 8.2. This book should be available in the office of Head Teacher.

The Head Teacher has the role of managing the Accident Book and associated reporting systems. The book should be reviewed regularly by the Head Teacher and Board of Directors in conjunction with Environment and Social Safeguard Unit representatives.

All near misses accidents must also be reported as soon as possible so that action can be taken to investigate the causes and to prevent recurrence.

### 12.3. Reporting Procedures

As part of the accident/incident management process, all accidents and near misses experienced by a member of school staff should be reported to their department head or to a senior member of staff and recorded. In the case of a student, parent or visitor accident should be reported to any member of staff present. Staff who received the report should provide the necessary assistance and escalate the incident as required.

School staffs have a duty to ensure that all accidents and near misses that are not minor are reported as soon as is practicable.

A report should be prepared for any accident that occurs on school premises or during school activities that is not minor. A common-sense approach should be taken to determining whether or not an accident is minor. As a guide, an accident is not trivial and a report should generally be prepared when:

- a serious incident report is prepared about an incident which resulted in death, injury or hospitalisation;
- there is an injury to the head or where a person loses consciousness;
- a person sustains an injury to the eyes or where teeth are broken or dislodged;
- a person sustains broken bones or lacerations requiring sutures;
- it is necessary to transport an injured person to hospital;
- medical attention is provided on site by an ambulance officer or health care professional or such treatment is reported by the student, visitor or parent at a later date;
- a student has to leave school early as a consequence of an accident;
- a parent, care-giver or relative is summoned to the school as a consequence of an accident;
- parents or caregivers are advised to take a student to a doctor for precautionary reasons;

Reporting should be completed after any assistance or first-aid has been delivered and once the safety of people involved in any incident has been ensured.

Any incident which constitutes a serious incident or an emergency must be reported to the senior person in charge of the site immediately. This should usually be the Head Teacher or his/her appointed deputy.

Injuries which occur while carrying out work duties off site, such as on school trips, must be reported and recorded in the same way.

If an injury renders an employee unable to make an accident report, a colleague, witness or some staff who is able report should make the incident report.

Head Teacher must ensure that all school staff and temporary staff are aware of accident reporting procedures.

Where an accident results during absence from work, Head Teacher, Departmental Heads or Deputy Head Teacher, and Finance and Administration must be informed. Employees who

are absent as a result of an accident at work must keep the school informed of their progress, up to and including a return to normal duties.

Injuries to students and visitors should be recorded in the accident book in the same way as for staff. Teachers and other support school staff who witness an accident should carry out the reporting after any assistance or first-aid has been delivered and once the safety of people involved in any incident has been ensured.

#### **12.4. Review and Investigation**

All accidents and incidents that occur in the school will be investigated by the management team of the school to ascertain the exact circumstances and the root causes. Lessons should be learnt and recommendations from accident investigations should be included in future safety procedures, risk assessments and standard operating procedures as appropriate. All investigations will be conducted in collaboration with Environment and Social Safeguard unit representative of IAIP.

Accident records will be reviewed regularly by the Head Teacher, the management team and Board of Directors in collaboration with Environment and Social Safeguard Unit representative of IAIP to ascertain the nature of incidents that have occurred in the school and whether there are any trends, patterns or identifiable outstanding risks. This review will be in addition to an individual investigation of the circumstances surrounding particular incidents.

# APPENDIX

## Appendix 1.1: Document Change Request Format

**Part 1: To be completed by the person who request document change**

**Description and justification of change**

1. Parts of the manual to be changed		
2. Affected Process		
3. Justification for the request:		
4. Enclosure (Title and No. of pages):		
Name:	Signature:	Date:

**Part 2: To be completed by the person who is authorized to approve documents (If approved, please assign document writer and if not indicate justifications)**

<b>Review and approval notes:</b>		
Name:	Signature:	Date:

## Appendix 1.2: Accident Report Format

**1. PERSONAL DETAILS OF STUDENT/VISITOR**

Full Name: ..... Age: ..... Date of Birth: .....  
 Name(s) of Parent(s)/Carer(s).....Address.....  
 Contact telephone number: .....

**2. ACCIDENT DETAILS**

Date of injury: ..... Time: ..... am/pm  
 Location of accident: .....  
 Describe the injuries sustained by the student/visitor: .....  
 .....  
 State exactly what happened .....  
 .....  
 Was first aid given by school? Y/N  
 Was further medical attention given? Y/N  
 Name of doctor/hospital: .....  
 On whose authority (teacher's/parent's)? .....  
 Subsequent treatment of student (if known).....  
 Parent(s)/Carer(s) of injured student/Suitable contact for Visitor have been notified? Y/N

**3. STATEMENT OF WITNESS**

Full Name: ..... Contact telephone number..... Address:  
 .....  
 When did the accident occur?.....  
 Where did the accident occur?.....

What activity was the student or visitor engaged in? (e.g., Playing, running to class).....

How did the injury/injuries occur? (Be sure to mention any article, or aspect of the environment which was involved, e.g., slipped on wet path)  
.....  
.....

What were the injuries/suspected injuries? .....

What treatment for the injury/injuries (if any) was provided at the place where the accident occurred?  
.....

Who was the student or visitor first referred to?  
.....

Who was present when the incident occurred?  
.....

Name of staff member(s) responsible for supervising the student/school area at the time of the accident.....

**4. STATEMENT BY ACCIDENT VICTIM**

Full Name of Accident Victim: ..... Age: .....

Date of birth.....Address: .....

Please write in your own words what happened:  
.....  
.....  
.....

Name of person completing this report.....

Signed: .....

Name: .....Signed: .....Date: .....

Principal/Delegate





## EMERGENCY PREPAREDNESS PLAN CHECKLIST

In the event of any form of emergency, teachers and support staff should be aware of the correct procedures to be adopted. It is the responsibility of the Head Teacher to familiarize staff with these procedures.

Head Teacher can nominate a person to be responsible for overseeing procedures in their school. Head Teacher should;

- nominate a central point as a meeting place in the case of emergency
- nominate a site as a safe area for evacuation
- Decide on the form of notification that an emergency procedure is beginning, e.g., a warning bell, siren, etc.

The Head Teacher should ensure that all staffs have a map of the school venue showing:

- the location of classes
- all exits and the direction of these exits
- Meeting points and evacuation sites.

Teachers, under the instruction of the Head Teacher or nominee, should occasionally perform drills so that everyone is aware of the correct procedure. In the case of evacuation from the classroom, Teachers must take their attendance roll with them and, upon assembling at the venue, must check that all students in their care have been evacuated.

**Emergency telephone numbers:** Telephone number of following offices/representative persons should be given to all staff and placed conveniently near all telephones.

- Head Teacher
- Person nominated by Head Teacher to oversee this procedure
- IAIP environment and social safeguard unit representative
- IAIP Ambulance
- IAIP Fire brigade
- IAIP Health Center
- IAIP engineering department
- IAIP security/Police

Dealing with emergencies should follow the procedures below;

### **Fire – External**

- Notify the fire brigade
- Ascertain the extent of the danger
- Continue as normal, or evacuate as directed
- Notify your school authority

### **Fire – Internal**

- Check the place and extent of the fire
- Evacuate as necessary
- Call the fire brigade or, if can be done safely, try to put the fire out

### **Lost student**

- Inform the Head Teacher or the most senior member of staff immediately
- Notify the child's parents

- Notify the police
- Maintain an open telephone line
- Investigate whether other Teachers or students know;
  - the student's possible whereabouts
  - what the student was wearing
  - the emotional state of the student
  - the time the student was last seen
- Have a school photo of the student available if possible

**Food contamination/poisonous substances;**

- Assess the number of people involved
- Notify the ambulance and a doctor in the health center of IAIP
- Give as much information as possible
- Notify the parents of any students involved
- Render first aid if possible or necessary
- Collect samples of the substances concerned – food, drink and vomitus – for testing and identification