

**The Republic of Moldova
Ministry of Economy and Infrastructure**

**SECOND COMPETITIVENESS ENHANCEMENT PROJECT
ADDITIONAL FINANCING
CEP-II AF Project**

Environmental and Social Management Framework

Volume II

Annexes

DRAFT

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Annex A. Environmental Screening Checklist

Annex A/Form 1

ENVIRONMENTAL SCREENING CHECKLIST

Part 1

(to be completed by Sub-borrower)

1. Project Name:

2. Brief Description of sub-project to include: nature of the project, project cost, physical size, site area, location, property ownership, existence of on-going operations, plans for expansion or new construction.

3. Will the project have impacts on the environmental parameters listed below during the construction or operational phases? Indicate, with a check, during which phase impacts will occur and whether mitigation measures are required.

Environmental Component	Construction Phase	Operational Phase	Mitigation Measures
Terrestrial environment			
Soil Erosion & Degradation: Will the project involve ploughing/ plant cultivation on the slopes?			
Habitats and Biodiversity Loss: Will the project involve use or modification of habitats (pasturing on and ploughing up the steppe areas, cutting or removal of trees or other natural vegetation, etc.)			
Land degradation: Will the project applies pesticides?			
Land, habitats & ecosystems degradation: In case of cattle production, will the project contribute to land, habitats and ecosystems degradation?			
Land & soil degradation: Will the project involve land excavation?			
Generation of solid wastes, including toxic wastes?			
Biodiversity and Habitats Loss: Will the project located in vicinity of protected areas or other sensitive areas supporting important habitats of natural fauna and flora?			
Land Erosion & Degradation: agricultural crop production & plantation crop production - will the project presume appropriate agricultural practices?			
Biodiversity Loss: enlargement of area under the agricultural crop production			
Soil & underground water pollution			
Land degradation, water pollution & aesthetics: Construction			
Other impacts			
Air quality			
Will the project provide pollutant emissions?			
Will the project generate specific air pollution (dioxins, furans, etc)			
Aquatic environment			
Water Quantity: will the project involve water use?			
Water Quality / Pollution: Will the project contribute to surface water pollution			
Underground and Surface Water Pollution: Will the project applies pesticides and inorganic fertilizers contributing to surface water pollution?			
Loss of Biodiversity: Will the project involve introduction of alien species (e.g., in case of aquaculture projects)?			
Loss of Biodiversity: Will the project located in vicinity of protected area or wetlands supporting both local avifauna and birds on passage?			

Environmental Component	Construction Phase	Operational Phase	Mitigation Measures
Degradation of natural aquatic ecosystems			
Weeds, pests, diseases: will the project contribute to spreading of weeds, pests and animal and plant diseases?			
Sedimentation of water bodies			
Other impacts			
Socio-economic environment			
Will the project assure non-deterioration of human health, occupational safety and non-disturbance of residents living near project area?			
Does the project require public consultation to consider local people environmental concerns and inputs?			
Social impacts			

4. For the environmental components indicated above, and using the information provided in the *table* below **describe the mitigation measures that will be included during the construction (C) or operational (O) phase of the project or both (B)**

Environmental Component	Phase (C, O or B)	Mitigation Measures

5. **Examples of Mitigation Measures** (for more detailed description of listed below and other potential mitigation measures refer to Annexes C, D & E)

Environmental Component	Mitigation Measures
Terrestrial ecosystems	
Soil Erosion & Degradation: Will the project involve ploughing/ plant cultivation on the slopes stimulating soil erosion and landslides?	1) Ploughing across the slope 2) Contour tillage 3) Avoid creation of new terraces since it is linked with loss of topsoil, etc.
Habitats and Biodiversity Loss: Will the project involve use or modification of habitats (pasturing on and ploughing up the steppe areas, cutting or removal of trees or other natural vegetation, etc.)	1) Avoiding use of remained natural or semi-natural steppe areas for pasturing and crop production 2) Avoid, where possible, cutting of trees and other natural vegetation, etc. 3) Minimize loss of natural vegetation/ Maximal preservation of vegetation during construction
Land degradation: Will the project applies pesticides?	1) Use of less harmful (non-persistent) pesticides 2) Not to apply more pesticides than needed 3) To ensure appropriate pesticides handling to avoid contaminated surface runoff, etc.
In case of cattle production, will the project contribute to land, habitats and ecosystems degradation?	1) Not to exceed pastures' capacity (on degraded lands this is 0,3-0,5 conv. cap/ ha; on good lands – 1,5 conv. cap/ per ha) and avoid overgrazing 2) Where possible, use of stabling 3) To develop sown pastures 4) Where possible, to fence grazing areas to use them subsequently, giving to others possibility to restore, etc. 5) Not to graze in natural areas in early spring and late autumn, etc.
Land & soil degradation: Will the project involve land excavation?	1) To dislocate excavated topsoil to adjacent agricultural lands
Generation of solid wastes, including toxic wastes?	1) Wastes reuse and recycling 2) Disposal on authorized landfills including on special toxic wastes disposal sites
Biodiversity and Habitats Loss: Will the project located in vicinity of protected areas or other sensitive areas supporting important habitats of natural fauna and flora?	1) Consideration of alternative locations, where possible 2) Careful timing of works and work seasonally, as appropriate: to avoid construction during breeding season 3) Where possible, to fence the area under construction to lessen occasional disturbance on habitats and biodiversity

Environmental Component	Mitigation Measures
	5) Use natural meadows and grasslands rather for mowing than grazing 4) Inform personnel about importance of adjacent environmentally important area, if any, etc.
Land Erosion & Degradation: Agricultural Crop Production & Plantation Crop Production - Will the project presume appropriate agricultural practices?	1) Appropriate crop rotation: fallow land – wheat – maize – sunflower – lucerne – lucerne (2 years long) – legumes (pea, haricot, etc.) / wheat maize, etc./ or rye- maize-sunflower-Lucerne-Lucerne-legumes-rye, etc 2) Plowing and tillage: plowing across the slope & contour tillage 3) On lands which are subject to erosion preferable cultivation of plants with require dense sowing (e.g. wheat, rye, etc.) and avoid cultivation of tilled crops (e.g., maize, sunflower), 4) Orchards: creation of grass strips between the rows, deep cultivation between the rows, 5) Where possible, to prefer agricultural land arrangement as follows: areas with cultivated crops alternated with areas used for pasturing and orchards, etc.
Biodiversity Loss: enlargement of area under the agricultural crop production	Where possible, to plant (or maintain) green corridors to ensure movement of terrestrial fauna
Soil & underground water pollution	1) Fuel and lubricants: use of specially arranged sites (with concrete floor) for their handling and storage to avoid their leakages into the soil and runoff into water bodies 2) Pesticides: see above 3) Use of special platforms and tanks with a waterproof bottom for accumulation of manure and preparing of organic fertilizers, etc.
Land degradation, water pollution & aesthetics: Construction	1) Careful selection of location for and planning of the project 2) To minimize construction site's size and design work to minimize land affected, 3) Where possible, to execute construction works during dry season to avoid excessive contaminated runoff 4) Properly arranged waste disposal sites 5) Cleaning of construction site, replacing the lost trees, re-vegetation of work area, etc.
Other impacts?	Other measures?
Air quality	
Will the project provide pollutant emissions?	1) Use of approved methods and techniques to prevent and control emissions (e.g. absorption) 2) Where possible, enclosure of dust producing equipment, and use of local exhaust ventilation 3) Where possible, arrange barriers for wind protection (if raw material is stored and processed in open areas) 4) Where possible, use of fuels with a low sulfur content, such as natural gas or liquefied petroleum gas and use of low-sulfur raw material 5) Where possible, installation of dedicated filtration systems, etc
Will the project generate specific air pollutants (furans, dioxins)?	1) Selection of materials or processes with no or low demand for VOC-containing products 2) Where possible to substitute the use of solvents and other materials which have a high VOC content 3) Where possible, to install and modify equipment to reduce solvent use in manufacturing process 3) <input type="checkbox"/> To execute strict primary and secondary control of air emissions, etc.
Aquatic Ecosystems	
Water Quantity: will the project involve water use?	1) To ensure natural flow of water/ minimum disruption of natural streams flows 2) To install water meters to control and minimize water use 3) Avoid or minimize surface water abstraction in case downstream the wetland is situated. etc.
Water Quality / Pollution: Will the project contribute to surface water pollution	1) a. For small rural enterprises: to install local wastewater treatment facilities (e.g., septic tanks) b. For big enterprises: not to exceed established limits of pollutants in effluents 2) To minimize water and mud collection

Environmental Component	Mitigation Measures
	3) Where possible, to renovate existing sewerage system/ ensure connection to municipal sewerage system 4) To arrange properly waste disposal sites
Underground and Surface Water Pollution: Will the project applies pesticides and inorganic fertilizers contributing to surface water pollution?	1) See above 2) Where possible, to plant at least bush vegetation down slope to reduce pollutants surface runoff into water bodies
Loss of Biodiversity: Will the project involve introduction of alien species (e.g., in case of aquaculture projects)?	1) Where possible, to avoid introduction of alien species 2) In case of use of already introduced alien species to ensure their non-coming into natural ecosystems, e.g., during water discharge from the ponds, etc.
Loss of Biodiversity: Will the project located in vicinity of protected area or wetlands supporting both local avifauna and birds on passage?	1) Not to exceed established limits of pollutants in effluents and emissions 2) To avoid or minimize construction and operational activities during breeding and migration periods, etc.
Degradation of natural aquatic ecosystems	1) Avoid application of pesticides in the strip with width of 300 m along the natural surface water bodies, 2) Avoid cutting of trees and other natural vegetation along the water bodies 3) Avoid coming of alien species into natural water bodies, 4) Properly arranged waste disposals sites, etc.
Weeds, pests, diseases: will the project contribute to spreading of weeds, pests and animal and plant diseases?	1) Avoid cultivation of plant mono-culture on agricultural lands 2) Appropriate pest management 3) Giving the priority to the agro-technical and biological measures for the control of weeds, pests, and diseases, 4) In cattle farms, to adhere established veterinary rules to prevent or minimize animal diseases, etc.
Sedimentation of water bodies	1) To avoid excessive soil erosion: see above 2) Minimize soil processing 3) Provide retention/ sedimentation ponds, as necessary 4) To control reed harvesting (to avoid over-harvesting)
Other impacts?	Other measures?
Socio-economic environment	
Will the project assure non-deterioration of human health, occupational safety and non-disturbance of residents living near project area?	1) To ensure collective and individual protective measures (work clothes, masks, shoes), when needed. 2) To adhere established occupational safety requirements as well as simple rules, e.g.: a. water spraying twice a day during construction to avoid dust b. permanent ventilation of internal areas c. timing of work 3) To conduct regular instructing of personnel on health and occupational safety requirements 4) To restrict vehicle speeds and trough-traffic in residential areas, especially trucks 5) Restrict trough-traffic in residential areas 6) Work timing to minimize disturbance/ restrict construction to certain hours 7) Restrict movement of hazardous materials in residential areas/ regulation of transportation of materials; apply any load restriction required during and post construction periods 8) Incorporate safety and environment protection requirements in the project contract documents, etc.
Does the project require public consultation to consider local people environmental concerns and inputs?	If yes, anticipated public concerns, e.g., project location, waste disposal sites, harmful emissions into environment, aesthetic arrangement of site under construction activities etc.
Social impacts	Appropriate project design: location, methods of construction, use of safe technologies during operation period, work timing, careful decommissioning, etc.

Annex A/Form 1

ENVIRONMENTAL SCREENING CHECKLIST

Part 2

(to be completed by the PFI based on the findings of the environmental screening and scoping process)

5. Sub-project Environmental Category (A, B or C) _____

6. Environmental Assessment required (yes or no) _____

7. Type of Environmental Assessment (full EIA for Category A projects; partial EIA for Category B sub-projects)

8. Types of EA documents (EIA report and detailed Environmental Management Plan for Category A sub-projects; partial EIA, including site assessment and Environmental Management Plan for Category B sub-projects; Site Assessment and EMP checklists for small scale Category B sub-projects) _____

9. What environmental issues are raised by the sub-project? _____

10. If an environmental assessment is required, what are the specific issues to be addressed? _____

11. What is the time frame and estimated cost of conducting the environmental assessment? _____

Environmental Screener:

Date:

Annex A/Form 1

ENVIRONMENTAL SCREENING CHECKLIST

Part 3

Final Environmental Assessment Checklist (1)

(to be completed by the CLD (in consultation with PIU ES and/or Ministry of Environment) based on review of the mitigation proposed and the environmental impact assessment (if required))

Was an Environmental Impact Assessment needed? (Y or N) ____ If yes, was it done? ____

Have national and World Bank requirements for public consultation been met and fully documented? (Y or N) ____

Was an Environmental Management Plan prepared? (Y or N) ____

Are the mitigation measures to be included in project implementation adequate and appropriate? (Y or N) ____

Will the project comply with existing pollution control standards for emissions and wastes? (Y or N) ____ If No, will an exemption be sought? ____

Is an Environmental Monitoring Plan necessary? (Y or N) ____ If so, has it been prepared? (Y or N) ____ Approved by the CLD? ____

What follow-up actions are required by the proponent, the PFI or the CLD?

Were public consultations held concerning potential environmental impacts of the proposed sub-project? (Y or N) ____ Were minutes recorded? (Y or N) ____

Dates

Participants

_____	_____
_____	_____
_____	_____

Project Officer:

Date:

Environmental Screener:

Date:

Annex A/Form 1

ENVIRONMENTAL SCREENING CHECKLIST

Part 4

Final Environmental Assessment Checklist (2)

(to be completed by the CLD (in consultation with PIU ES and/or Ministry of Environment) based on review of the mitigation proposed and the environmental impact assessment (if required))

Is the project documentation complete? If not what is missing?

Are land use and resource use permits required? If so have they been received?

Are discharge permits required for solid waste? If so have they been received?

Are discharge permits required for wastewater discharge? If so have they been received?

Is there a sanitary inspection required? Has a permit been issued?

Has the environmental assessment been received and approved?

Is there potential for soil degradation or contamination? If yes, have appropriate prevention or mitigation measures been planned and budgeted?

Is there potential for water quality degradation or contamination? If yes, have appropriate prevention or mitigation measures been planned and budgeted?

Is there potential for air quality degradation or contamination? If yes, have appropriate prevention or mitigation measures been planned and budgeted?

Is there a threat to the biological environment? If yes, have appropriate prevention or mitigation measures been planned and budgeted?

Is there potential for adverse impacts on the social environment? If yes, are there necessary prevention, mitigation or compensation measures planned and budgeted?

Was the level of public involvement in design and planning and public consultation sufficient? Were public concerns raised in the consultation process adequately addressed?

What is the desired level, frequency and scope of environmental monitoring during the construction phase?

What is the desired level, frequency and scope of environmental monitoring during the operational phase?

Annex A/Form 2

ENVIRONMENTAL SCREENING CHECKLIST

Field site visit checklist

Project Name: **Date/time of Visit:**
Rayon: **Visitors:**

Current activity and site history

- Who is the site contact (name, position, contact information)?
- What is the area of the site to be used for project activities?
- What are current users of the site?
- What were previous uses of the site (give dates if possible)?
- Are there any encroachers or illegal users of the site whose livelihoods or assets are going to be affected by the project?

Environmental Situation

- Are there sensitive sites nearby (nature reserves, cultural sites, historical landmarks)?
- Are there water courses on the site?
- What is the terrain or slope?
- Does the site experience flooding, waterlogging or landslides? Are there signs of erosion?
- What are the neighboring buildings (e.g. schools, dwellings, industries) and land uses? Estimate distances.
- Will the proposed site affect transportation or public utilities?

Licenses, Permits and Clearances

- Does the site require licenses or permits to operate the type of activity proposed? Are these available for inspection?
- What environmental or other (e.g., health, forestry) authorities have jurisdiction over the site?

Water Quality Issues

- Does the proposed activity use water for any purposes (give details and estimate quantity). What is the source?
- Will the proposed activity produce any effluent? (estimate quantity and identify discharge point)
- Is there a drainage system on site for surface waters or sewage? Is there a plan available of existing drainage or septic systems?
- How waste water is managed (surface water courses, dry wells, septic tanks)?

Soils

- What is the ground surface (agricultural land, pasture, etc.)?
- Will the project damage soils during construction or operations?
- Will the project affect the landscape significantly (draining wetlands, changing stream courses)?

Biological environment

- Describe vegetation cover on the site.
- Is there information about rare or threatened flora and fauna at or near the site? If yes, would the project have an impact or increase risk to the species?
- Obtain a list of vertebrate fauna and common plants of the site (if available).
- Note potential negative impacts on biota if project proceeds.

Visual Inspection Procedures

- Try to obtain a site map or make a sketch to mark details.
- Take photos, if permitted.
- Walk over as much of the site as possible, including boundaries, to note adjacent activities.
- Note any odors, smoke or visual dust emissions, standing water, etc.

Annex A / Form 3

ENVIRONMENTAL SCREENING CHECKLIST

Terms of reference for conducting an Environmental Impact Assessment study

An environmental impact assessment report Categories A and B sub-projects focuses on the significant environmental issues raised by a sub-project. Its primary purpose is to identify environmental impacts and those measures that, if incorporated into the design and implementation of a project can assure that the negative environmental effects will be minimized. The scope and level of detail required in the analysis depend on the magnitude and severity of potential impacts.

The Environmental Impact Assessment Report should include the following elements:

- a. *Executive Summary*. This summarizes the significant findings and recommended actions.
- b. *Policy, legal and administrative framework*. This section summarizes the legal and regulatory framework that applies to environmental management in the jurisdiction where the study is done.
- c. *Project Description*. Describes the nature and scope of the project and the geographic, ecological, temporal and socioeconomic context in which the project will be carried out. The description should identify social groups that will be affected, include a map of the project site, and identify any off-site or support facilities that will be required for the project.
- d. *Baseline data*. Describe relevant physical, biological and social condition including any significant changes anticipated before the project begins. Data should be relevant to project design, location, operation or mitigation measures.
- e. *Environmental impacts*. Describe the likely or expected positive and negative impacts in quantitative terms to the extent possible. Identify mitigation measures and estimate residual impacts after mitigation. Describe the limits of available data and uncertainties related to the estimation of impacts and the results of proposed mitigation.
- f. *Analysis of Alternatives*. Systematically compare feasible alternatives to the proposed project location, design and operation including the "without project" alternative in terms of their relative impacts, costs and suitability to local conditions. For each of the alternatives quantify and compare the environmental impacts and costs relative to the proposed plan.
- g. *Environmental Management Plan (EMP)*. If significant impacts requiring mitigation are identified, the EMP defines the mitigation that will be done, identifies key monitoring indicators and any needs for institutional strengthening for effective mitigation and monitoring to be carried out.
- h. *Appendices*.

These section should include:

- (i) The list of EIA preparers;
- (ii) References used in study preparation;
- (iii) A chronological record of interagency meetings and consultations with NGOs and effected constituents;
- (iv) Tables reporting relevant data discussed in the main text, and;
- (v) A list of associated reports such as resettlement plans or social assessments that were prepared for the project.

Annex A/Form 4

ENVIRONMENTAL SCREENING CHECKLIST

Environmental Management Plan Checklist

(for small scale construction/rehabilitation sub-projects)

ENVIRONMENTAL /SOCIAL SCREENING			
Will the site activity include/involve any of the following:	Activity	Status	Additional references
	A. Building rehabilitation	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section B below
	B. New construction	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section B below
	C. Individual wastewater treatment system	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section C below
	D. Historic building(s) and districts	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section D below
	E. Acquisition of land ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section E below
	F. Hazardous or toxic materials ²	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section F below
	G. Impacts on forests and/or protected areas	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section G below
	H. Handling / management of medical waste	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section H below
	I. Traffic and Pedestrian Safety	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section I below

ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST
A. General Conditions	Notification and Worker Safety	(a) The local construction and environment inspectorates and communities have been notified of upcoming activities (b) The public has been notified of the works through appropriate notification in the media and/or at publicly accessible sites (including the site of the works) (c) All legally required permits have been acquired for construction and/or rehabilitation (d) All work will be carried out in a safe and disciplined manner designed to minimize impacts on neighboring residents and environment. (e) Workers will comply with international good practice (always hardhats, as needed masks and safety glasses, harnesses and safety boots) (f) Appropriate signposting of the sites will inform workers of key rules and regulations to follow.
B. General Rehabilitation and /or Construction Activities	Air Quality	(a) During interior demolition use debris-chutes above the first floor (b) Keep demolition debris in controlled area and spray with water mist to reduce debris dust (c) Suppress dust during pneumatic drilling/wall destruction by ongoing water spraying and/or installing dust screen enclosures at site

¹ The project will support construction of new buildings only in the case when land acquisition is not necessary and there are no any resettlement issues; for such cases the investor should have the landownership title as well as has to prove the land at the moment of sub-projects application is not occupied or used even illegally

² Toxic / hazardous material includes and is not limited to asbestos, toxic paints, removal of lead paint, etc.

ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST
		(d) Keep surrounding environment (side walks, roads) free of debris to minimize dust (e) There will be no open burning of construction / waste material at the site (f) There will be no excessive idling of construction vehicles at sites
	Noise	(a) Construction noise will be limited to restricted times agreed to in the permit (b) During operations the engine covers of generators, air compressors and other powered mechanical equipment should be closed, and equipment placed as far away from residential areas as possible
	Water Quality	(a) The site will establish appropriate erosion and sediment control measures such as e.g. hay bales and / or silt fences to prevent sediment from moving off site and causing excessive turbidity in nearby streams and rivers.
	Waste management	(a) Waste collection and disposal pathways and sites will be identified for all major waste types expected from demolition and construction activities. (b) Mineral construction and demolition wastes will be separated from general refuse, organic, liquid and chemical wastes by on-site sorting and stored in appropriate containers. (c) Construction waste will be collected and disposed properly by licensed collectors (d) The records of waste disposal will be maintained as proof for proper management as designed. (e) Whenever feasible the contractor will reuse and recycle appropriate and viable materials (except asbestos)
C. Individual wastewater treatment system	Water Quality	(a) The approach to handling sanitary wastes and wastewater from building sites (installation or reconstruction) must be approved by the local authorities (b) Before being discharged into receiving waters, effluents from individual wastewater systems must be treated in order to meet the minimal quality criteria set out by national guidelines on effluent quality and wastewater treatment (c) Monitoring of new wastewater systems (before/after) will be carried out
D. Historic building(s)	Cultural Heritage	(a) If the building is a designated historic structure, very close to such a structure, or located in a designated historic district, notify and obtain approval/permits from local authorities and address all construction activities in line with local and national legislation (b) Ensure that provisions are put in place so that artifacts or other possible “chance finds” encountered in excavation or construction are noted, officials contacted, and works activities delayed or modified to account for such finds.
E. Acquisition of land	Land Acquisition Plan/Framework	(a) If expropriation of land was not expected and is required, or if loss of access to income or damage to assets of legal or illegal users of land was not expected but may occur, that the bank Task Team Leader is consulted. (b) The approved by the Bank Land Acquisition Plan (if required by the project) will be implemented prior to start of project works.
F. Toxic Materials	Asbestos management	(a) If asbestos is located on the project site, mark clearly as hazardous material (b) When possible the asbestos will be appropriately contained and sealed to minimize exposure (c) The asbestos prior to removal (if removal is necessary) will be treated with a wetting agent to minimize asbestos dust (d) Asbestos will be handled and disposed by skilled & experienced professionals (e) If asbestos material is be stored temporarily, the wastes should be securely enclosed inside closed containments and marked appropriately (f) The removed asbestos will not be reused
	Toxic / hazardous waste management	(a) Temporarily storage on site of all hazardous or toxic substances will be in safe containers labeled with details of composition, properties and handling information (b) The containers of hazardous substances should be placed in an leak-proof container to prevent spillage and leaching (c) The wastes are transported by specially licensed carriers and disposed in a licensed facility. (d) Paints with toxic ingredients or solvents or lead-based paints will not be used

ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST
G. Affects forests and/or protected areas	Protection	<ul style="list-style-type: none"> (a) All recognized natural habitats and protected areas in the immediate vicinity of the activity will not be damaged or exploited, all staff will be strictly prohibited from hunting, foraging, logging or other damaging activities. (b) For large trees in the vicinity of the activity, mark and cordon off with a fence large trees and protect root system and avoid any damage to the trees (c) Adjacent wetlands and streams will be protected, from construction site run-off, with appropriate erosion and sediment control feature to include by not limited to hay bales, silt fences (d) There will be no unlicensed borrow pits, quarries or waste dumps in adjacent areas, especially not in protected areas.
H. Disposal of medical waste	Infrastructure for medical waste management	<ul style="list-style-type: none"> (a) In compliance with national regulations the contractor will insure that newly constructed and/or rehabilitated health care facilities include sufficient infrastructure for medical waste handling and disposal; this includes and not limited to: <ul style="list-style-type: none"> ▪ Special facilities for segregated healthcare waste (including soiled instruments “sharps”, and human tissue or fluids) from other waste disposal; and ▪ Appropriate storage facilities for medical waste are in place; and ▪ If the activity includes facility-based treatment, appropriate disposal options are in place and operational
I Traffic and Pedestrian Safety	Direct or indirect hazards to public traffic and pedestrians by construction activities	<ul style="list-style-type: none"> (b) In compliance with national regulations the contractor will insure that the construction site is properly secured and construction related traffic regulated. This includes but is not limited to <ul style="list-style-type: none"> ▪ Signposting, warning signs, barriers and traffic diversions: site will be clearly visible and the public warned of all potential hazards ▪ Traffic management system and staff training, especially for site access and near-site heavy traffic. Provision of safe passages and crossings for pedestrians where construction traffic interferes. ▪ Adjustment of working hours to local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement ▪ Active traffic management by trained and visible staff at the site, if required for safe and convenient passage for the public. ▪ Ensuring safe and continuous access to office facilities, shops and residences during renovation activities, if the buildings stay open for the public.

Annex B. Content of the Environmental and Social Management Plan

Annex B/Form 1

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN CONTENT

The content of the sub-project ESMP will include the following:

(a) Mitigation

- The ESMP identifies measures and actions in accordance with the mitigation hierarchy that reduce potentially adverse environmental and social impacts to acceptable levels. The plan will include compensatory measures, if applicable. Specifically, the ESMP:
 - i) identifies and summarizes all anticipated adverse environmental and social impacts (including those involving indigenous people or involuntary resettlement);
 - ii) describes—with technical details—each mitigation measure, including the type of impact to which it relates and the conditions under which it is required (e.g., continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate;
 - iii) estimates any potential environmental and social impacts of these measures; and takes into account, and is consistent with, other mitigation plans required for the project (e.g., for involuntary resettlement, indigenous peoples, or cultural heritage).

(b) Monitoring

- The ESMP identifies monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed in the environmental and social assessment and the mitigation measures described in the ESMP. Specifically, the monitoring section of the ESMP provides (a) a specific description, and technical details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions; and (b) monitoring and reporting procedures to (i) ensure early detection of conditions that necessitate particular mitigation measures, and (ii) furnish information on the progress and results of mitigation.

(c) Capacity Development and Training

- To support timely and effective implementation of environmental and social project components and mitigation measures, the ESMP draws on the environmental and social assessment of the existence, role, and capability of responsible parties on site or at the agency and ministry level.
- Specifically, the ESMP provides a specific description of institutional arrangements, identifying which party is responsible for carrying out the mitigation and monitoring measures (e.g., for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training).
- To strengthen environmental and social management capability in the agencies responsible for implementation, the ESMP recommends the establishment or expansion of the parties responsible, the training of staff and any additional measures that may be necessary to support implementation of mitigation measures and any other recommendations of the environmental and social assessment.

(d) Implementation Schedule and Cost Estimates

- For all three aspects (mitigation, monitoring, and capacity development), the ESMP provides (a) an implementation schedule for measures that must be carried out as part of the project, showing

phasing and coordination with overall project implementation plans; and (b) the capital and recurrent cost estimates and sources of funds for implementing the ESMP. These figures are also integrated into the total project cost tables.

(e) Integration of ESMP with Project

- The Borrower's decision to proceed with a project, and the Bank's decision to support it, are predicated in part on the expectation that the ESMP (either stand alone or as incorporated into the ESCP) will be executed effectively. Consequently, each of the measures and actions to be implemented will be clearly specified, including the individual mitigation and monitoring measures and actions and the institutional responsibilities relating to each, and the costs of so doing will be integrated into the project's overall planning, design, budget, and implementation.

Resource: ESF, ESS1—Annex 1. Environmental and social assessment.

Annex B/Form 2

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN CONTENT

Environmental and Social Management Plan Format

	Impact	Mitigating Measure(s)	Cost		Institutional Responsibility		Remarks
			Install	Operate	Install	Operate	
CONSTRUCTION Phase							
Environmental Component							
Soils							
Water Resources							
Air Quality							
Fauna and Flora							
Social Component							
Aesthetics and Landscape							
Human Communities							
Traffic							
Resettlement							
Job/Income losses							
Health and safety							
Historical and Cultural Sites							
Safety and health of staff and population							
OPERATION Phase							
Environmental Component							
Soils							
Water Resources							
Air Quality							
Fauna and Flora							
Social Component							
Aesthetics and Landscape							

Human Communities							
Historical and Cultural Sites							
Safety and health of staff and population							
DECOMMISSIONING Phase							
<i>Environmental Component</i>							
<i>Social Component</i>							

Annex B/Form 3**ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN CONTENT****Environmental and Social Monitoring Plan Format**

Phase	What parameter is to be monitored?	Where will the parameter be monitored?	How will the parameter be monitored?	When will the parameter be monitored?	Why is the parameter being monitored?	Cost		Institutional Responsibility	
						<i>Install</i>	<i>Operate</i>	<i>Install</i>	<i>Operate</i>
Baseline									
Construction									
Operation									
De-commissioning									

Annex C. Environmental Screening Checklist for existing facilities

Annex C/Form 1

ENVIRONMENTAL SCREENING CHECKLIST

For existing facilities

Part 1

(to be completed by Sub-borrower)

1. **Sub-project title** _____
2. **Brief Description of sub-project** (nature of the project, project cost, physical size, site area, location, facility history, operational/production activities, technological processes etc.)

3. **Inputs, output (products) and waste stream** (raw materials, natural resources (e.g. water) and energy used in operational/production activities, final products, effluents and technological wastes, secondary materials, waste disposal etc.)

4. **Key Environmental, Health and Safety aspects of the facility's operation** (potential impacts and risks caused by operational activities (e.g. industrial solid wastes, contaminated waste waters, air emissions, noise pollution), mitigation measures during operational/technological processes, preventive actions etc.)

5. **Regulatory Compliance Status** (per local environmental and sanitary inspection conclusions)

6. **Environmental authorizations, licenses and permits** (as requested by the national legislation and relevant to proposed sub-project activities: check ✓ and specify if any)

a. State Ecological Expertise	
b. Special water use and waste water discharge authorization	
c. Air emissions authorizations	
d. Waste disposal permit	
e. License for special type of activity (specify)	
f. License for mineral resources usage	
g. Permit for usage of wild fauna and flora	
h. Sanitary operational authorization	
i. Sanitary and veterinary operational authorization	
j. Other as per national legislation (specify)	
7. **Environmental expenditures** (for Environmental management and Environmental pollution and/or for Natural resources usage; please fill a table)

Expenditure Item	Total Calculated per Year, MDL	Last payment, Date/MDL
1.		
2.		

Sub-borrower: _____ Signature: _____ Date: _____

Annex C/Form 1

ENVIRONMENTAL SCREENING CHECKLIST
For existing facilities

Part 2

(to be completed by the PFI)

- 1. Sub-project category (B or C)**
- 2. Environmental compliance with environmental standards** *(yes / no)*
- 3. Environmental Auditing** *(conducted or not)*
- 4. Environmental authorizations, licenses and permits** *(check ✓ and specify if any)*

- a. State Ecological Expertise
- b. Special water use and waste water discharge authorization
- c. Air emissions authorizations
- d. Waste disposal permit
- e. License for special type of activity (specify)
- f. License for mineral resources usage
- g. Permit for usage of wild fauna and flora
- h. Sanitary operational authorization
- i. Sanitary and veterinary operational authorization
- j. Other as per national legislation (specify)

- 5. Facility's Environmental and Sanitary inspections** *(main conclusions regarding EHS compliance)*
- 6. Payments for the environmental pollution** *(done or not)*

Project officer: _____ **Signature:** _____ **Date:** _____

Annex C/Form 1

ENVIRONMENTAL SCREENING CHECKLIST
For existing facilities

Part 3
(to be completed by the CLD)

1. Was an Environmental Auditing conducted? *(yes / no)* []
2. Was an Environmental Action Plan prepared? *(yes / no)* []
3. Will the project comply with existing pollution control standards for emissions and wastes? *(yes / no)* []
 If “no”, will an exemption be sought? []
4. Is an Environmental Monitoring Plan necessary? *(yes / no)* []
 If so, has it been prepared? *(yes or no)* []
 Approved by the PIU Environmental Consultant? []
5. Are all relevant environmental authorizations, licenses and permits obtained? *(yes / no)* []
6. Is the facility in compliance with the environmental standards? *(yes / no)* []
7. What follow-up actions are required by the proponent, the PFI or the PIU?

8. Conclusions:

PIU Environmental Consultant: _____ **Signature:** _____ **Date:** _____

Annex D. Environmental Audit Protocol for existing facilities

ENVIRONMENTAL AUDIT PROTOCOL OUTLINE for existing facilities

(to be completed by Sub-borrower for Categories B sub-projects)

Executive Summary

1.0 Nature of operation (2 pages)

- 1.1 Brief description of the facility
- 1.2 Key Environmental, Health and Safety aspects *(potential impacts and risks caused by operational activities (e.g. industrial solid wastes, contaminated waste waters, air emissions, noise pollution), mitigation measures during operational/technological processes, preventive actions etc.)*
- 1.3 Brief description of operational/technological processes
- 1.4 Facility Location and Description of Environs
- 1.5 Facility and Site History

2.0 Corporate Environmental, Health and Safety Management (1 page)

- 2.1 Organization of EHS Management *(responsible person(s)/unit(s))*
- 2.2 Contingency Planning and Emergency Procedures
- 2.3 Staff Training and Supervision

3.0 Environmental Performance of the Company/Facility (3 pages)

- 3.1 National Regulatory Requirements, Policies and Procedures *(list the Environmental relevant regulations)*
- 3.2 Applicable WB/ Other Requirements and Standards
- 3.3 Inputs, products, and Waste Stream *(Raw Materials Consumption and Sources (where appropriate); Water Consumption and Source (where applicable); Energy Consumption and Source; Intermediate products; Effluent Amounts and Quality; Emission Sources and Quality; GHG Contribution; Solid and Hazardous Wastes; Noise and Vibration; Electromagnetic Issues etc.)*
- 3.4 Waste Management, Disposal of Wastes *(describe the existing procedures and practices, list the relevant documents and contracts)*
- 3.5 Management of Hazardous Materials (including PCBs and Asbestos) *(describe the existing procedures, list the relevant documents and contracts)*
- 3.6 Soil and Groundwater Contamination *(describe existing risks and sources, mitigation measures, list the relevant documents etc.)*
- 3.7 Environmental Monitoring Activities *(e.g. Water&Soil quality monitoring (testing), effluent and emission control, internal and external environmental audit and inspection)*
- 3.8 Regulatory Compliance Status *(per local environmental inspection conclusions)*
- 3.9 Environmental Expenditures *(for Environmental management and Environmental pollution and/or for Natural resources usage; please indicate item and amount per year)*

4.0 Public and Occupational Health and Safety Performance (1 page)

- 4.1 Local/National Regulatory Requirements *(list the Labor safety and Public health relevant regulations (e.g. Labor Code))*
- 4.2 Applicable WB and/or other Requirements and Standards
- 4.3 Current H&S Monitoring Practice *(e.g. monitoring program, internal/external inspections, supervisor visits, list the relevant documents etc.)*
- 4.4 Summary of Regulatory Compliance Status *(per local Labor safety and Public health inspection conclusions)*

5.0 Conclusions and Recommendations (1 page)

- 5.1 Regulatory Compliance *(per local EHS inspection general conclusions and recommendations)*
- 5.2 Environmental Management Issues
- 5.3 Health and Safety Issues
- 5.4 Stakeholder Dialogue and External Reporting
- 5.5 EHS Performance Monitoring Protocol
- 5.6 Environmental Action Plan
- 5.7 Required further actions/studies

Annexes: (i) Photo/video/CD log; (ii) Copies of Environmental Authorizations, Permits and other Documentation; Copies of Environmental and of Sanitary Inspection Protocols; (iii) Copies of made environmental payments; etc.

Sub-borrower: _____ **Signature:** _____ **Date:** _____

Environmental Consultant: _____ **Signature:** _____ **Date:** _____

Annex E. Impacts, Causes, Consequences and Mitigation measures for sub-projects in Agricultural Production Sector

- E-1 Mammalian livestock production*
- E-2 Poultry production*
- E-3 Annual crop production & plantation crop production*
- E-4 Aquaculture*
- E-5 Seeds
- E-6 Pedigree seeds
- E-7 Fertilizers application
- E-8 Pesticides application
- E-9 Agricultural machinery (tractors, winnowers, sowing machines, etc.)
- E-10 Vehicles
- E-11 Buildings for crop stock, machinery and other agricultural needs
- E-12 Land preparation
- E-13 Fuel & Lubricants' Storage and Handling
- E-14 Fencing
- E-15 Veterinary service

*Resource: Environmental, Health, and Safety Guidelines. World Bank Group, 2007.
<http://www.ifc.org/ifcext/sustainability.nsf/Content/EnvironmentalGuidelines>

Table E-1. Mammalian livestock production				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Overall Potential Impact: MODERATE TO HIGH				
Contribution to soil, surface water and groundwater pollution from generated wastes	Animal wastes can be either liquid, slurry, or solid, depending on the solids content Solid waste includes waste feed, animal waste, and carcasses.	Damage to environment	Wastes should be managed and disposed appropriately	Animal waste management systems involve the collection, transport, storage, treatment, and utilization (rather than disposal) of the waste to reduce such adverse impacts
<ul style="list-style-type: none"> Waste Feed 	<p>Livestock feed includes hay, grain and silage.</p> <p>Other wastes include various kinds of packaging, used cleaning materials, and sludges from septic tanks. Most of the animal waste is generated at housing, feeding, and watering locations</p>		<p>To maximize the efficiency of the operation and minimize wasted feed</p>	
<ul style="list-style-type: none"> Animal Waste 		<p>Migration of contaminants to and pollution of surface water, groundwater and air</p>	<ul style="list-style-type: none"> - To arrange manure storage facilities to prevent soil, surface water and groundwater pollution - Minimize the surface area of manure in storage - Locate manure stacks away from water bodies - Place dry manure or litter in a covered or roofed area; - Check for storage systems leakage regularly (e.g. inspect tanks for corrosion of seams) - Conduct manure spread only as part of well planned strategy that considers potential risks to health 	<p>Manure may be used as a fertilizer on agricultural land after careful assessment of potential impacts due to the presence of hazardous chemical and biological constituents</p> <p>Ensure that manure is applied to agricultural land only during periods that are appropriate for its use as plant</p>

Table E-1. Mammalian livestock production				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Animal Carcasses	Mammalian meat processing		<ul style="list-style-type: none"> -Reduce mortalities through proper animal care and disease prevention; -Store carcasses until collection, using cooling if necessary to prevent putrefaction; - Where no authorized collection of carcasses is available, on-site burial may be one of the only viable alternatives, if allowed by the competent authorities 	<p>nutrient (generally just before the start of the growing season)</p> <p>Animal carcasses should be properly managed and quickly disposed to prevent the spread of odors</p>
Contribution to surface and underground water pollution/ Wastewater	<p>Livestock operations generate on-point source</p> <p>Some facilities may also include point sources which typically require collection and treatment prior to final discharge</p>	Effluents due to runoff from livestock housing, feeding, and watering, waste management facilities, and areas of land application of manure	<p>To reduce discharges to surface water and groundwater from mammalian livestock operations:</p> <ul style="list-style-type: none"> - Reuse water used for cleaning milking equipment to clean the milking parlor; - Reduce water use and spills from animal watering by preventing overflow -Implement buffer zones to surface water bodies, avoiding land spreading of manure within these areas; - To reduce water consumption, especially where it may be a limited natural resource 	<p>Techniques for treating industrial process wastewater in this sector include:</p> <ul style="list-style-type: none"> - Sedimentation for suspended solids reduction - Biological treatment, typically anaerobic followed by aerobic treatment, for reduction of soluble organic matter (BOD); - Biological nutrient removal for reduction in nitrogen and phosphorus; - Chlorination of effluent when disinfection is required
Air pollution/ Air Emissions	Air emissions include ammonia, methane, odors, and dust (e.g. from feed storage, loading, and unloading)	Ammonia gas has a sharp and pungent odor can act as an irritant when present in high enough concentrations.	<ul style="list-style-type: none"> - Consider the siting of new facilities taking into account distances to neighbors and the propagation of odors; - Control the temperature, 	The livestock account for 9% of anthropogenic CO ₂ emissions (mostly from deforestation / land use changes for grazing and

Table E-1. Mammalian livestock production				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
<ul style="list-style-type: none"> Dust 		Dust reduce visibility, cause respiratory problems, and facilitate the transport of odors and diseases	humidity, and other environmental factors of manure storage to reduce emissions; <ul style="list-style-type: none"> - Consider composting of manure to reduce odor emissions; - Reduce emissions and odors during land application activities by applying a few centimeters below the soil surface and by selecting favorable weather conditions (e.g. wind blowing away from inhabited areas); - If necessary, apply chemicals (e.g. urinase inhibitors) weekly to reduce conversion of nitrogen to ammonia - Control the temperature, humidity, and other environmental factors of manure storage to reduce methane and nitrous oxide emissions; - Implement pasture/grazing management techniques to reduce nitrous oxide and methane emissions; - Install dust-collection systems at dusty operations, such as feed grinding; - Prevent overgrazing of pastureland; - Implement fugitive-dust-control measures, such as wetting frequently traveled dirt roads, as necessary 	pasture for feed crops), 37% of anthropogenic methane emissions (mostly from enteric fermentation by ruminants), and 65 percent of anthropogenic nitrous oxide emissions, the majority of which from manure. Methane has 23 times the global warming potential (GWP) of CO ₂ , while nitrous oxide has 296 times the GWP of CO ₂ . By improving livestock production efficiency, producers can both increase profits and reduce methane emissions. Methane can also be produced from microbial action in manure
Soil and water pollution/ Pesticides	Pesticides may be applied directly to livestock or to	Pesticides and their degradation products may	Pesticides should be managed to avoid their migration into off-	Integrated Pest Management (IPM) <i>inter alia</i> include:

Table E-1. Mammalian livestock production				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
	infra-structures. Pesticides can also be used to control predators	enter groundwater and surface water in solution, in emulsion, or bound to soil particles. Some are known to cause chronic or acute health hazards for humans as well as adverse ecological impacts	site land or water environments by establishing their use as part of an integrated pest management. If the application of pesticides is warranted, spill prevention and control measures consistent with the recommendations applicable to pesticides and other potential hazardous materials should be followed.	- Maintain structures to keep out pests (e.g. plug holes, seal gaps around doors and windows); - Use mechanical controls to kill, relocate, or repel pests; - Use predators to control pests
Other impacts <ul style="list-style-type: none"> Environmental damage Overgrazing Soil erosion 	<p>Livestock access to creeks, rivers, and other natural water sources;</p> <p>Alteration of the vegetation composition and associated organisms in rangelands</p>	<p>Contaminating the water with animal waste, destroying riparian habitat, eroding the stream banks</p> <p>Soil losses and a reduction in soil productivity</p>	<p>- Prevent animals' access to surface water bodies using fences, buffer strips or other physical barriers;</p> <p>- Prevent overgrazing of pastureland through use of:</p> <ul style="list-style-type: none"> o Rotational grazing systems based on seasonal and local ecosystem resilience (e.g. riparian zones); o through properly evaluated pasture capacities, which are from 0,3 conv. cattle capita per ha on degraded lands to 1,5 conv. cattle capita on good lands; <p>- Use of stabling;</p> <p>- Not to pasture in early spring and late autumn;</p> <p>- Use of livestock trails to reduce soil trampling and gully formation</p>	

Table E-1. Mammalian livestock production				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
<ul style="list-style-type: none"> Loss of Biodiversity 			-Prior or more intensive land use for livestock production, survey the area to identify natural and modified habitat types and ascertain their biodiversity value; - Ensure that any natural or modified habitat to be converted to livestock production does not contain critical habitat, - Ensure minimum disturbance to surrounding areas when managing livestock	
Animal diseases	Animal diseases can enter a facility with new animals, on equipment, and on or people	Some diseases can weaken or kill large numbers of animals at an infected facility	- Control farm animals, equipment, personnel, and wild or domestic animals entering the facility; - Vehicles that go from farm to farm should be subject to special precautions such as limiting their operation, etc. - Sanitize animal housing areas; - Identify and segregate sick animals and develop procedures for adequate removal and disposal of dead animals	
Residual Impact Assuming Full Mitigation: LOW– MODERATE; Risk: LOW				

Table E-2. Poultry production				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Overall Potential Impact: MODERATE TO HIGH				
Soil, groundwater and surface water pollution/ Wastes	Solid waste generated during poultry production includes waste feed, animal waste, carcasses, and sediments and	Contribution to soil pollution, surface water and groundwater pollution		

Table E-2. Poultry production				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
<ul style="list-style-type: none"> Waste Feed Animal Waste 	<p>sludge from on-site wastewater treatment. Other wastes include various kinds of packaging, used cleaning materials, etc.</p>	<p>Contamination of storm water runoff, primarily due to organic matter content</p>	<p>- Protect feed from exposure to rain and wind during processing, storage, transport and feeding; - Maintain feed storage, transport and feeding systems in good working condition; - For waste feed which can not be recycled due to potential biosecurity issues, alternative disposal methods should be secured in consultation with local health authorities</p>	<p>Collection, transport, storage, treatment, utilization and disposal of the waste. Manure is sometimes composted, but can also be stored in stacking sheds, roofed storage areas, outside and either covered or uncovered, or occasionally in ponds until it is ready for transport to a disposal site or land application area. Manure may be used as a fertilizer on agricultural land after careful assessment of potential impacts due to the presence of hazardous chemical and biological constituents</p>
	<p>Poultry feed primarily consists of corn and soy, although other grains, pulses, root crops, and substances of animal origin. The feed is typically supplemented with amino acids, enzymes, vitamins, mineral supplements, and may contain hormones, antibiotics, and heavy metals.</p> <p>Manure contains ammonia, nitrogen, phosphorus, and other excreted substances such as hormones, antibiotics, and heavy metals, as well as bacteria and pathogens.</p>	<p>Air emissions of ammonia and other gases - a potential risk of contamination to surface or groundwater resources through leaching and runoff.</p> <p>Pollution of soil, water and food resources.</p>	<p>- Match feed content to the specific nutritional requirements of the birds in their different production / growth stages; - Ensure that manure storage facilities are arranged to prevent manure contamination of surface water and ground water (e.g. use of concrete floors, etc.) - Keep waste as dry as possible, including by minimizing amount of water used during cleaning; - Minimize the surface area of manure in storage;</p>	

Table E-2. Poultry production				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
<ul style="list-style-type: none"> □ Poultry Carcasses 			<ul style="list-style-type: none"> - Locate manure piles away from water bodies, - Check for leakage regularly (e.g. inspect tanks for corrosion of seams), - Place dry manure or litter in a covered or roofed area; <p>Poultry carcasses should be properly and quickly managed as they are a significant source of disease and odors, and can attract vectors.</p> <ul style="list-style-type: none"> - Reduce mortalities through proper animal care and disease prevention; - Where no authorized collection of carcasses is available, on-site burial may be one of the only viable alternatives, if allowed by the authorities 	Land spread manure directly after batch cleaning and only during periods that are appropriate for its use as plant nutrient (generally just before start of the growing season)
Contribution to surface and groundwater pollution/ Wastewater	Runoff from poultry housing, feeding, and watering; from waste storage and application of manure, may generated non-point source effluents due to runoff	Contamination of surface water and groundwater with nutrients, ammonia, sediment, pesticides, pathogens, and feed additives, such as heavy metals, hormones, and antibiotics. Effluents from poultry operations typically have a high content of organic material, as well as nutrients and suspended solids	<ul style="list-style-type: none"> -Reduce water use and spills from animal watering by preventing overflow - Install vegetative filters to trap sediment; - Install surface water diversions to direct clean runoff around areas containing waste - Implement buffer zones to surface water bodies, as appropriate to local conditions and requirements; - Avoiding land spreading of manure close to waterbodies -To reduce water consumption, especially where it may be a limited natural resource 	Possible techniques for wastewater treatment: <ul style="list-style-type: none"> - Sedimentation for suspended solids reduction - Biological treatment for reduction of soluble organic matter (BOD); - Chlorination of effluent when disinfection is required; - Dewatering of residuals and composting or land application of wastewater treatment residuals of acceptable quality
Air pollution/ Air Emissions	Include primarily ammonia, odors and dust		To minimize emissions	

Table E-2. Poultry production				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
<ul style="list-style-type: none"> Ammonia and Odors Dust 	Reduce visibility, cause respiratory problems, and facilitate transport of odors and diseases	Ammonia gas deposition into surface waters may contribute to eutrophication. Release of ammonia gas also reduces the nitrogen content and, therefore, the fertilizer value of the manure	<ul style="list-style-type: none"> - Consider the location of new facilities taking into account distances to neighbors and the propagation of odors; - Consider composting of manure to reduce odor emissions; - Reduce emissions and odors during land application activities by applying a few centimeters below the soil surface and by selecting favorable weather conditions (e.g. wind blowing away from inhabited areas); - If necessary, apply chemicals (e.g. urinase inhibitors) weekly to reduce conversion of nitrogen to ammonia - Implement fugitive dust-control measures (e.g. wetting vehicle parking lots and frequently traveled dirt roads, as necessary) 	
Water and soil pollution/ Pesticides use	Pesticides may be applied directly to birds or to infra-. Pesticides can also be used to control predators.	Pesticides and their degradation products may enter groundwater and surface water in solution, in emulsion, or bound to soil particles. Pesticides may, in some instances, impair the uses of surface waters and groundwater. Some pesticides are known to cause chronic or acute health hazards for humans as well as adverse ecological impacts	<ul style="list-style-type: none"> - Maintain structures to keep out pests (e.g. plug holes, seal gaps around doors and windows); - Use mechanical controls (e.g. traps, barriers, light, and sound) to kill, relocate, or repel pests; - Use predators to control pests. - Protect natural enemies of pests by providing a favorable habitat (e.g. bushes for nesting sites and other indigenous vegetation) that can house pest predators; - Use good housekeeping practices; 	Pesticides should be managed to avoid their migration into off-site land or water environments by establishing their use as part of an Integrated Pest Management (IPM)

Table E-2. Poultry production				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
			<ul style="list-style-type: none"> - Consider covering manure piles with geotextiles (which allow water to enter the pile and maintain composting activity) to reduce fly populations; - If pesticides are used, identify in the IPM plan the need for the pesticide and evaluate their effectiveness, to ensure that the pesticide with the least adverse impact is selected 	
Animal Diseases	Animal diseases can enter a facility with new animals, or equipment, and on people.	Some diseases can weaken or kill large numbers of animals at an infected facility. Both poultry manure and carcasses contain pathogenic organisms which can infect humans, for example viruses such as Avian Influenza (strain HN51), and parasites such as parasitical worms	<p>To minimize the potential for the spread of poultry pathogens:</p> <ul style="list-style-type: none"> - Establish sound biosecurity protocols for the entire poultry operation that control animals, feed, equipment, and personnel, entering the facility - Prevent the interaction of wild birds with feed, as this interaction could be a factor in the spread of avian influenza from sparrows, crows, etc. - Vehicles that go from farm to farm (e.g. transport of veterinarians, farm suppliers, buyers, etc.) should be subject to special precautions such as limiting their operation to special areas - Sanitize bird housing areas; - Identify and segregate sick birds and adequately remove and dispose dead birds ☐ 	
Residual Impact Assuming Full Mitigation: LOW– MODERATE; Risk: LOW				

Table E-3. Annual crop production & plantation crop production				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Overall Potential Impact: MODERATE				
Water Consumption	Water intake for irrigation:	Stress on water resources	<ul style="list-style-type: none"> - Select crops compatible with water availability in the area; - Maximize the use of available precipitation (“rain harvesting”), where feasible, by: <ul style="list-style-type: none"> o Reducing runoff by methods such as conservation tillage, terraces, and raised ridges that follow the land contour o Reduce seepage losses in channels o Control weeds on inter-row strips and keep them dry o Avoid over and under-irrigation to decrease potential for soil salinization o Maintain border vegetation in canals and drainage systems 	Water management for annual crop production should aim to optimize crop yield, while conserving the quantity and quality of water resources
Soil erosion and loss of productive capacity	Poor management especially due to excessive use of machinery and over-intensive farming practices	Soil degradation Soil erosion may be enhanced by heavy rainfalls, storms, and steep or long slopes, and may contribute to subsequent sedimentation of surface water bodies	Soil loss prevention practices: <ul style="list-style-type: none"> - Use crops suited or adapted to the local climate and soil conditions; - In areas with steep slopes, carefully consider planting zones and the direction of planting in relation to land contours to avoid erosion caused by precipitation or irrigation; - Use stone barriers, vegetative cross-slope barriers, terraces, or drainage and diversion canals to prevent wind and water erosion; - Use appropriate machinery to avoid soil compaction caused by 	

Table E-3. Annual crop production & plantation crop production				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
			<p>excessively heavy equipment;</p> <ul style="list-style-type: none"> - Use plant cover or intercrops and shelterbelts to reduce erosion from wind and heavy rain; - Increase the organic matter content in the soil by applying organic matter such as crop residues, compost, and manure to protect the soil physically from sun, rain, and wind and to feed soil biota; - Consider adding lime to soil maintain stable pH levels 	
Soil, groundwater and surface water pollution/ Pesticides	Application	Contamination of soil, groundwater and surface water by pesticides/impact on human health and biodiversity	<p>The preference should be given to alternative pest management strategies, with the use of synthetic chemical pesticides as a last option.</p> <p>Pesticide Application</p> <p>If pesticide application is warranted, then the following measures are recommended:</p> <ul style="list-style-type: none"> -Train personnel to apply pesticides; -Review the manufacturer's directions on maximum recommended dosage or treatment, and apply the minimum effective dose; -Avoid the use of banned and obsolete pesticides; - Use only pesticides that are labeled in accordance with approved standards and norms; - Use certified application equipment; 	Pesticides should be managed to avoid their migration into off-site land or water environments

Table E-3. Annual crop production & plantation crop production				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
			<ul style="list-style-type: none"> - Establish untreated buffer zones or strips along water sources, rivers, streams, ponds, lakes, and ditches to help protect water resources -Store pesticides in their original packaging, in a dedicated, dry, and well aerated location ; - Mixing and transfer of pesticides should be undertaken by trained personnel in areas, dedicated for this purpose; - Purchase and store no more pesticide than needed 	
Surface water pollution/ Nutrients	Nutrients input from area under the crop production (mainly from mineral fertilizers)	Eutrophication of surface water/ dissolved oxygen depletion	<ul style="list-style-type: none"> - Balance nutrient application, including considering the use of reduced or no soil tillage techniques, nutrient recycling, one-pass soil preparation and sowing; - Use crop rotation methods to enable cultivation of leguminous plants with nitrogen fixation capabilities; - Use plants to cover the soil, especially during a fallow period to reduce loss of nutrients; - Incorporate organic waste materials into soils rather than burning; - Avoid excess fertilization; - Assess soil acidity, which is important for achieving maximum uptake of phosphates; - Not to apply solid or liquid manure directly onto grazing areas or edible crops 	

Table E-3. Annual crop production & plantation crop production				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Loss of biodiversity	Soil degradation, fragmentation and disturbance of habitats, etc.	Loss of Genetic Resources and Variability	<ul style="list-style-type: none"> - Where possible, maximize reuse of residue from the previous crop on the soil surface; - Reduce soil preparation to maintain the natural soil structure; - Utilize field borders to provide wildlife corridors around fields used for annual crop production; - Provide buffer zones on farmland bordering natural or semi-natural habitats; - Promote the use of organic agricultural practices to the extent feasible 	
Soil pollution/ Crop residues and other solid waste	Often relate to pesticide containers and obsolete, expired pesticides		<ul style="list-style-type: none"> -Recycle crop residues and other organic materials by leaving the materials in the fields, plowing, and / or composting; -Manage expired and unwanted pesticides as hazardous wastes 	
Air pollution/ Air emissions	Fuel combustion by-products resulting from the operation of mechanized equipment or from combustion by-products from the disposal or destruction of crop residues.		<ul style="list-style-type: none"> -Manage emissions from farm equipment both mobile and stationary; - Reduce particulate matter emissions by avoiding burning; - Avoid unintended emissions of persistent organic pollutants (POPs) which may arise from open burning of pesticide treated agricultural wastes 	
Residual Impact Assuming Full Mitigation: LOW– MODERATE; Risk: LOW				

Table E-4. Aquaculture				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Overall Potential Impact: MODERATE				
Construction phase				
Threats to biodiversity	<ul style="list-style-type: none"> - Construction project cycle of an aquaculture facility - Alteration of the natural hydrology of rivers or wetlands - Changes to stream hydrology caused by the construction of barriers to flow 	Conversion of natural habitats during construction	<ul style="list-style-type: none"> - Assess soil properties prior to pond construction to ensure that the bottom-sealing layer of the soil with percolation rates/porosity low enough to satisfactorily hold pond water -Survey the project area to identify natural and modified habitats and ascertain their biodiversity importance; - Design facilities so that as much as possible of the natural vegetation habitat is left intact (e.g. through the use of vegetated buffer zones and habitat corridors) ; -Design the pond depth to reduce the need for chemical control of aquatic weeds and reduce thermal stratification 	<p>If there is not enough clay, then the ponds may demonstrate high seepage rates and require additional expenditure or eventual abandonment.</p> <p>High seepage rates can also pollute groundwater required for other purposes in the vicinity with use for drinking water a major concern</p>
Soil Erosion and Sedimentation	Pond-based aquaculture system	Affect aquatic systems during construction activities, primarily the mobilization of soils and sediments	<ul style="list-style-type: none"> - Construct pond and canal levees with a 2:1 or 3:1 slope (based on soil type) as this adds stability to the pond banks and reduces erosion; Avoid pond construction in areas that have a slope of more than 2%, as this will require energy-intensive construction and maintenance; - Stabilize the embankments to prevent erosion; - Reduce excavation and disturbance of soils during construction; 	

Table E-4. Aquaculture				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
			<ul style="list-style-type: none"> - Carry out construction work during the 'dry' season to reduce sediment runoff that may pollute adjacent waters; - Install temporary silt fences during construction to slow down and catch any suspended sediments 	
Operation phase				
<p>Threats to biodiversity</p> <ul style="list-style-type: none"> • loss of genetic resources • Introduction of alien species 	<ul style="list-style-type: none"> - Construction project cycle of an aquaculture facility - Collection of larvae, fry, or juveniles for aquaculture production; Potential release of artificially propagated seed into the wild stock; - Sustainability of fish meal and fish oil ingredients for fish and crustacean feeds; - Development of antibiotic resistance in pathogenic bacteria that can then spread from farms to wild stock <p>Interactions with the wild</p>	<ul style="list-style-type: none"> - Alteration of aquatic habitats and substrates <p>Introductions can disturb the existing ecological balance; cause loss of species biodiversity; cause loss of genetic diversity of the wild</p>	<ul style="list-style-type: none"> - Ensure that the area to be used for aquaculture does not represent a habitat that is sensitive areas Ensure that the area to be used for aquaculture does not represent or includes high biodiversity value, such as known sites of critically endangered or endangered species, or important wildlife breeding, feeding, and staging areas; -Be aware of the presence of critically endangered or endangered species in the areas already used for aquaculture production, and implement management processes that take them into account - Farming of sterile fish; - Preventing the escape of species from pond-based aquaculture systems; - When necessary, consider 	<p>The widespread seeding of an alien genotype is of considerable concern both as regards species biodiversity and genetic biodiversity</p>

Table E-4. Aquaculture				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
		populations; reduce fitness of wild population through breeding with genetically altered escapees; and result in the transmission or spread of fish diseases	chemical treatment of water released from hatcheries (e.g. with chlorine at acceptable concentrations for the receiving waters) to destroy escaping larvae or juveniles - To ensure that the pond embankments are high enough to contain the pond water and prevent escape of the species during periods of heavy rainfall and potential flooding - Preventing the escape of species from open water aquaculture systems. - Provide adequate marking of the fish farm system	
Contamination of Aquatic Ecosystems • through contaminated wastewater discharges	Aquaculture activities, particularly pond-based system Release of effluents or communication to receiving water from unconfined process and storage tanks (such as ponds and lagoons) Particulate organic matter and erosion of pond floor, walls and discharge channels	Affect aquatic systems during operation activities, the release of effluents Contamination of water by nutrients (creation of eutrophication zones), suspended solids , etc.	- Regularly monitor feed uptake to determine whether it is being consumed and adjust feeding rates accordingly; -- Spread feed as evenly as possible; -Perform slaughter and - processing in an area where the effluent is contained; - Avoid discharging waters from ponds while they are being harvested with nets; - If feasible, use partial draining techniques to empty ponds that have been harvested; - After harvest, hold the remaining water in the pond for a number of days before discharge, or transfer to a separate treatment facility.	Pond ecosystems have a limited capacity to recycle organic matter and nutrients, and increasing the stocking rate removes this capacity, resulting in the build-up of organic matter, nitrogenous waste, and phosphorus both in the water mass and on the bottom of the pond The management strategy is to (i) reduce the amount of contamination of the effluent; (ii) prevent pond effluent from entering surrounding water bodies; and (iii) treat the effluent before its release into the receiving waters to reduce contaminant levels.

Table E-4. Aquaculture				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
			<ul style="list-style-type: none"> -Plan the rate and mode of application of fertilizers to maximize utilization and prevent over-application; - Conduct pond fertilization to avoid or minimize consequences of potential runoff due to floods or heavy rain and avoid application to overflowing ponds 	Aquaculture operations in large water bodies, however, are open to the surrounding environment and do not have the second or third options, therefore any contamination takes effect immediately
Residual Impact Assuming Full Mitigation: LOW; Risk: LOW				

Table E-5. Seeds				
Potential Impacts	Causes	Consequences	Mitigation/prevention required	Remarks
Overall Potential Impact: MODERATE				
Soil, groundwater and surface water pollution/ Use of chemical fertilizers, and pesticides		Surface water pollution by nutrients resulting in waterbodies eutrophication Water and soil pollution by pesticides/ impact on human health and biodiversity	Avoid excess fertilization (for other fertilize-related measures refer to Table E-3 Annual Crop Production & Plantation Crop Production); <ul style="list-style-type: none"> - Avoid the use of banned and obsolete pesticides - Use only pesticides that are labeled in accordance with international standards and norms (for other pesticide-related measures refer to Table E-3) 	
Risk for introduction of genetically modified plant seed	Transfer of introduced genes to other species (possibly weedy or invasive), unanticipated impact on beneficial insects, or increased pest resistance. Another concern related to the introduction or export of plants	Genetic drift into other areas where GMOs are not wanted	<ul style="list-style-type: none"> - Use certified crop seeds that do not contain seeds from invasive alien species; -The introduction of GMO crops should be assessed for compliance with the existing host country regulatory 	

Table E-5. Seeds				
Potential Impacts	Causes	Consequences	Mitigation/prevention required	Remarks
	and plant products is the potential for introduction of pests		framework for such introductions	
Residual Impact Assuming Full Mitigation: LOW– MODERATE; Risk: LOW				

Table E-6. Pedigree seeds				
Overall Potential Impact: MODERATE – HIGH				
Potential Impacts	Causes	Consequences	Prevention/ Mitigation required	Remarks
Risk of introduction of genetically modified organisms enhanced by input of pesticides		Genetic drift into other areas where GMOs are not wanted; Development of pesticide resistant weeds	- Use certified crop seeds that do not contain seeds from invasive alien species; -The introduction of GMO crops should be assessed for compliance with the existing host country regulatory framework for such introductions	GoM has a policy of banning GMOs however there is little control on their entry into the country
Water and soil pollution	Increased use of high levels of chemical fertilizers and pesticides.	Soil and water contamination leading to modified aquatic ecosystems.	Determination and application of optimum quantities and scheduling for fertilizers; Development and implementation of the Integrated Pest Management (IPM) program; Use of organic farming techniques (for other fertilizer- and pesticide-related measures refer to Table E-3)	In general terms, high yielding varieties (HYV) require large inputs to achieve expected results – plant species and varieties would have to be examined on a case by case basis; close liaison with MAIA required. Currently, organic farming techniques are commonly used currently and may be applied, where needed
Residual Impact Assuming Full Mitigation: LOW – MODERATE; Risk: MODERATE				

Table E-7. Fertilizers application				
Overall Potential Impact: MODERATE TO HIGH (cumulative impact)				
Direct Impacts	Causes	Consequences	Mitigation Required	Remarks
Soil degradation/ Reduction in soil organic content	Reliance on chemical fertilizers which do not have an organic component – less reliance on compost material and manure for meeting soil fertility requirements.	Modified soil structure and reduction in soil moisture holding capacity; increase in soil acidity. In the long run, possible loss of productivity as a result of insufficient soil moisture; loss of soil's natural fertility	-Apply organic matter, such as manure, to replace chemical fertilizers to the extent practical; -Incorporate manure into the soil or apply between growing crops to improve plant utilization of nutrients and thereby reduce nutrient loss etc.	To develop application rates and best land husbandry and crop rotation plans
Air pollution	Emission of greenhouse gases from chemical fertilizers.	Contribution to global warming resulting in climate change	- Where feasible, use biofuels instead of fossil energy to reduce net GHG emissions; - Adopt reduced tillage options to increase the carbon storage capacity of soils	
Water pollution	Nutrient enrichment of water bodies from fertilizer runoff	Eutrophication of water bodies Modified aquatic ecosystems	-Time the application of crop nutrients using meteorological information to avoid, where feasible, application during or close to precipitation events; -Use appropriate technical equipment for spraying manure; -Establish buffer zones, strips, or other “no-treatment” areas along water sources, rivers, streams, ponds, lakes, and ditches to act as a filter to catch potential runoff from the land	To develop and implement the most appropriate to the area land and crop practices Impact form a single husbandry will not be significant but cumulatively, over many husbandries within the same watershed the impact could be significant
Probable Residual Impact Assuming Full Mitigation: LOW – MODERATE				

Table E-8. Pesticides application*				
Significance of Overall Potential Impact: HIGH (cumulative impact)				
Potential Impacts	Causes	Consequences	Mitigation Required	Remark
Diseases/ Illness	Improper handling, application and storage of pesticides.	Increased healthcare costs; lost work time; lost family income.	Proper handling and use of pesticides;	

Table E-8. Pesticides application*				
Significance of Overall Potential Impact: HIGH (cumulative impact)				
Potential Impacts	Causes	Consequences	Mitigation Required	Remark
	Consumption of crops with high levels of pesticide residues		Proper storage of pesticides; Use only approved pesticides; Sanitary measures (proper cleaning, washing etc.) (for other measures refer to Table E-3)	
Soil contamination	Residual pesticides in soil.	Loss of soil productivity; long term loss / altered soil micro-fauna important to soil / plant relationships.	Use of approved pesticides and recommended application rates, scheduling and mode of application (for other measures refer to Table E-3)	
Loss of biodiversity	Pesticide ingestion by fauna.	Loss of fauna	Use of approved pesticides and recommended application rates, scheduling and mode of application (for other measures refer to Table E-3)	
Water pollution	Ground and surface water contamination.	Impaired health of local and downstream water consumers; increased health costs; lost work time; lost family income Damage to aquatic ecosystems Loss of biodiversity.	Use of approved pesticides and recommended application rates, scheduling and mode of application (for other measures refer to Table E-3)	International waterways may be affected. Pesticide use not likely significant on a single husbandry but cumulatively on many farms within the same watershed, impact could be significant
Probable Residual Impact Assuming Full Mitigation: MODERATE; Risk: HIGH				

* Note: More detailed description of the pesticides application and handling is presented in the Table E-3. Annual crop production & plantation crop production Chapter “Pest Management Issues” in the main text.

Table E-9. Agricultural Machinery (tractors, winnowers, sowing machines, etc.)				
Significance of Overall Potential Impact: MODERATE TO HIGH				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
Soil and water pollution	Contamination from machine fuels and lubricants.	Loss of soil productivity Decrease of crop production Deterioration of potable water quality	Good practices to be carried out by equipment operators Agricultural machinery should be kept in good conditions	This is a minor impact and awareness to operators to refuel under safe conditions is all that would be required.

Table E-9. Agricultural Machinery (tractors, winnowers, sowing machines, etc.)				
Significance of Overall Potential Impact: MODERATE TO HIGH				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
			Fuels and lubricants are to be stored and handled in devoted areas, etc.	
Air pollution	CO ₂ releases	Contribution to greenhouse gasses and global warming.	To ensure that all machinery engines are efficient and well maintained	
Soil erosion	Tillage against the contour	Increase surface runoff contributing to increased surface waterbodies alluviation Reduced soil percolation capacity, etc.	Tillage on the contour	To advise farmers on proper tilling techniques with tractors
Soil compaction	Use of heavy machinery	Soil erosion and alluviation of waterbodies Poor water permeability of the soil profile/ decrease of soil moisture, etc.	Ensure equipment of a size that suitable for soil conditions	Large farms require more machinery
Probable Residual Impact Assuming Full Mitigation: LOW				

Table E-10. Vehicles				
Potential Overall Impact: LOW				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
Air pollution	CO ₂ emissions	Contribution to global warming/ climate change.	Efficient engines Where possible, to use biofuel	
Soil and water pollutin	Use, handing and storage of fuel and lubricants	Leakages into soil and groundwater	To maintan engine a good condtions to avoid machine oil leakages To use specially organized sites for handling and storage of fuel and lubricants	
			For other measures refer to Table E-13	
Probable Residual Impact Assuming Full Mitigation: LOW; Risk: LOW				

Table E-11. Buildings for crop stock, machinery and other agricultural needs				
Potential Overall Impact: LOW				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
Soil degradation/ Loss of productive topsoil	Improper location of buildings	Reduced income from lower amount of crop production	Location of buildings in sites with low soil productivity; Proper design to minimize area under construction	This is not likely to be an important consideration
			For other measures refer to Table E-1 Construction activities	
Residual Impact Assuming Full Mitigation: LOW; Risk: LOW				

Table E-12 Land preparation				
Significance of Overall Potential Impact: MODERATE TO HIGH				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
Soil erosion	Land preparation during rains Cultivation against the contour Long fallow period followed by ploughing	Loss of topsoil and soil productivity Decrease of soil moisture Waterbodies alluviation Impact on aquatic ecosystem modified Increased impact of floods and drought	- Appropriate contour ploughing; - Optimal ploughing schedules to ensure minimal time for exposed soil. Appropriate agricultural practices (e.g. shallow tilling and minimum tillage)	Should be implemented jointly with use of other good husbandry practices including maintenance of cropping residues (i.e. no open burning), etc.
			For other measures refer to Table E-3 Annual Crop Production and Plantation Crop Production	
Residual Impact Assuming Full Mitigation: LOW; Risk: HIGH				

Table E-13. Fuel & Lubricants' Storage and Handling				
Potential Overall Impact: LOW				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
Loss of productive land	Improper location of buildings.	Reduced income from lower crop production.	Location of buildings on sites with low productivity; efficient design to minimize space required.	This is not likely to be a major consideration.
Water pollution.	Improper disposal of used	Pollution of ground and	Construction to include	

Table E-13. Fuel & Lubricants' Storage and Handling				
Potential Overall Impact: LOW				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
	lubricants and improper handling of fuels and lubricants Leachate of fuel and lubricants into groundwater and surface runoff to water bodies	surface water results in deterioration surface water used for drinking water supply, affects aquatic ecosystems & associated biodiversity	impermeable flooring and bunds to prevent leachate and runoff	
Soil contamination	Improper storage and handling of fuels and lubricants Improper disposal of waste lubricants	Loss of soil productivity. Lost revenue Deterioration of water quality used for domestic and irrigation water supplies Impact to human health Impact to livestock though improper watering; Altered and damaged aquatic ecosystems	Proper storage and handling of fuel; Containment of fuel containers within concrete bounded area; proper disposal of waste lubricants.	Leaded gasoline is prohibited for use in Moldova
Probable Residual Impact Assuming Full Mitigation: LOW; Risk: LOW				

Table E-14. Fencing				
Significance of Overall Potential Impacts: Low				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
Social disruptions	Exclusion of certain people or groups from land to which they have had traditional access either for use or for passage	Prolonged legal procedures and ill feelings within community	Consultation with affected groups or people ensuring equal voice for women; Where required, establishment of easement conditions.	This is not likely to be a problem; Public consultation should identify any potential problems;
Probable Residual Impact Assuming Full Mitigation: NONE				

Table E-15. Veterinary services (associated with Mammalian Livestock and Poultry Production activities)				
Significance of Overall Potential Impacts: LOW				
Potential Impacts	Causes	Potential Consequences	Mitigation Required	Remarks
Possible human diseases	Ingestion of meat products	Lost job & and income	Use of organic methods of	Only approved drugs and

	containing hormones, antibiotics and other chemicals		livestock husbandry; Minimal application of only indeed necessary drugs	hormones should be used.
Soil and water contamination.	Insecticides used in dip tanks Antibiotics and other chemicals used in veterinary.	Contaminated soil and water is not used for cultivation Contaminated of water for irrigation purposes; Impact on downstream aquatic ecosystems	Proper containment and disposal of dip tank liquids to avoid soil and water contamination.	
			For other measures refer to Tables C-1 Mammalian livestock production & C-2 Poultry production	
Probable Residual Impact Assuming Full Mitigation: NONE				

Annex F. Impacts, Causes, Consequences and Mitigation measures for sub-projects in Agro-processing & Food production Sectors

- F-1 Poultry & meat processing*
- F-2 Slaughter-houses
- F-3 Poultry & meat packing
- F-4 Dairy*
- F-5 Vegetable oil processing*
- F-6 Sugar manufacturing*
- F-7 Food and beverage processing*
- F-8 Breweries*
- F-9 Vegetable processing and canning*
- F-10 Frozen food production
- F-11 Flour milling
- F-12 Warehousing
- F-13 Markets

* Resource: Environmental, Health, and Safety Guidelines. World Bank Group, 2007.
<http://www.ifc.org/ifcext/sustainability.nsf/Content/EnvironmentalGuidelines>

Table F-1. Poultry & meet processing				
Overall Potential Impact: HIGH (due to human health threat)				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Soil, groundwater and surface water pollution/ Solid organic wastes and by-products	Slaughtering and rendering activities	<p>Poultry: the carcass yield is, on average, 75% of the live bird weight</p> <p>Meet: Waste products and by-products of slaughtering processes The quantity of by-products from cattle often exceeds 50% of the animal's live weight, and 10 to 20% for pigs Special Risk Materials (SRM)</p>	<p>Poultry: Provision of adequate slurry storage capacity for excreta until it is transported for disposal or for use as agricultural fertilizer</p> <p>Meet: continuously collect by-products dry and segregated from each other, along the length of the slaughter-line and throughout animal by-products treatment; optimise bleeding and the collection of blood; use sealed, storage, handling and charging facilities for animal by-products</p>	
Animal and birds diseases Birds: Highly Pathogenic Avian Influenza (HPAI)	Batch of birds delivered to the slaughterhouse is suspected of infection with Highly Pathogenic Avian Influenza (HPAI)	Other birds and human diseases.	<p>Poultry: Birds must be stored separately to avoid contact with healthy birds</p> <ul style="list-style-type: none"> - HPAI should be suspected when the dead-on-arrival frequency is abnormally high, and in connection with other symptoms - If HPAI is confirmed, the entire carcass of the dead birds should be handled as high risk material and transported safely to a rendering facility. - The slaughterhouse should be cleaned and disinfected, and a minimum operational shutdown of 24 hours should be applied etc. 	

Table F-1. Poultry & meat processing				
Overall Potential Impact: HIGH (due to human health threat)				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
<i>Livestock:</i> bovine spongiform encephalopathy (BSE), etc.			<i>Livestock:</i> should be separated and transported to external facilities in separate containers for treatment and final disposal. - Tissue of a livestock treated as Special Risk Material should be destroyed through incineration with a minimum gas temperature of 850°C; - Collecting animals not approved by veterinary inspection and segregating them from animal materials sent by the slaughterhouse for off-site rendering	
Soil and water pollution/ Sludge Treatment and Disposal	Poultry and meat processing operators	Surface water, groundwater and soil pollution	<i>Poultry:</i> - Reuse of high-quality, low risk by-products; - Disposal of fat at landfills if it cannot be used for biogas production <i>Livestock:</i> - Reuse materials that may be separated from pretreatment processes in the manufacture of high-quality by-products (e.g. pet food or technical fat for manufacturing); - If no other alternatives are feasible, dispose of fat at landfills	

Table F-1. Poultry & meet processing				
Overall Potential Impact: HIGH (due to human health threat)				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Surface and groundwater pollution/ Wastewater	<p>Poultry processing activities</p> <p>Meet process activities</p>	<p>Poultry & Meet: Effluents with high content of organic matter, nitrogen, phosphorus, residues of chemicals, pathogens</p>	<p>Poultry:</p> <ul style="list-style-type: none"> - Organic materials to collect separately for recycling; -Ensuring that leakage from animal by-product storage containers is avoided; -Use of dripping trays to collect blood to transport to the blood tank rather than into the wastewater stream; Application of appropriate tank and equipment cleaning procedures -Choosing cleaning agents and application rates that do not have adverse impacts on the environment, or on wastewater treatment processes and sludge quality for agricultural application <p>Meet:</p> <ul style="list-style-type: none"> - Prioritize the removal of solid waste before it enters the wastewater stream; - Collect blood for use in food, feed or in the pharmaceutical industry; -Prevent direct runoff to water courses, especially from manure storage areas, etc 	
Water Consumption	Poultry & Meet processing operations	Stress on water resources	<ul style="list-style-type: none"> - Optimizing water consumption for rinsing and cooling without jeopardizing food safety; -Prefer a dry cleaning process areas before cleaning with water 	

[illegible]

Table F-1. Poultry & meet processing				
Overall Potential Impact: HIGH (due to human health threat)				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Energy Consumption	Heating of water and producing steam for process applications, cleaning purposes and operation of mechanical and electrical equipment, refrigeration, and air compressors	Stress on natural resources	Poultry & Meet: - Control of water levels and recirculation of water; - Improvement in cooling efficiency by insulating refrigeration room / areas and doors; installation of an automatic door closing mechanism, etc.	
Probable Residual Impact Assuming Full Mitigation: LOW				

Table F-2. Slaughter-houses (this item is combined with a Poultry and Meet Processing)				
Overall Potential Impact: HIGH (due to threat to human health)				
Potential Impacts	Cause	Consequences	Mitigation Required	Remarks
Contaminated meat	Poor sanitary conditions including lack of protective clothing and ineffective maintenance; processing of sick and diseased animals.	Consumers become ill; lost work days; lost productivity and income; abattoir's reputation leads to lost business.	Provision of protective clothing; effective use of disinfectants; effective sanitary inspections leading to required standards being met; effective regulatory animal and meat inspection.	
Contaminated groundwater and surface water	Improper disposal of animal manure and offal as well as bones and other non-useable animal parts including blood.	Contaminated drinking water (E. coli) resulting in illness (possibly death), lost productivity and income.	Ground waste bone, meat and offal into flour for animal feed (see remarks); blood can be used for blood sausage; other water and blood waste must be collected and treated before proper disposal into municipal waste treatment systems; manure should be recycled or allowed to mature in an impervious containment – mature manure can be applied as fertilizer for crop production	Current ban on using such flour as animal feed in other countries due to threat of spongiform encephalitis (BCE-mad cow disease) which can result in deadly Jacob Kreifeldt disease in humans for those consuming meat of infected animals.

Table F-2. Slaughter-houses (this item is combined with a Poultry and Meat Processing)				
Overall Potential Impact: HIGH (due to threat to human health)				
Potential Impacts	Cause	Consequences	Mitigation Required	Remarks
			or on pastures.	
Odour	Manure; refrigerants (NH ₃); animals and carcasses.	Nuisance to nearby residents.	Avoid escaping NH ₃ ; maintain good sanitary conditions; dispose of manure in a timely fashion.	
Ozone depletion	Refrigeration and freezing units utilizing Freon or ammonia.	Increase in UV rays resulting in skin cancer if proper protection is not taken; can also affect plant health.	Convert refrigerants from ozone depleting substances (NH ₃ and chlorofluorocarbons) to a hydrofluorocarbon	MD is party to the Vienna Convention and the Montreal Protocol on ozone-depleting substances.
Lowering of groundwater table	Large volumes of water used in washing.	Exhausting of groundwater resources	Water apportioning; efficient use of water including recycling.	Of particular concern when planning a new abattoir that water resources are sufficient to meet needs of present and future users
Injuries	Knives and saws used in the processing; large and heavy animal carcasses can fall and cause injury.	Lost productivity, work days and income.	Safety instructions; safety clothing where appropriate (e.g. hard hats).	
General Remark				<i>For sites with more than one activity to minimize consumption and emission levels the BAT is for slaughterhouses to have processing plants and meat poultry cutting plants on the same site</i>
Residual Impact Assuming Full Mitigation: LOW; Environmental Risk: MODERATE				

Table F-3. Poultry & meat packing (this activity is often combined with a Poultry and Meat Processing)				
Overall Potential Impact: HIGH (due to threat to human health threat)				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
Contaminated meat	Poor sanitary conditions including lack of protective clothing and ineffective maintenance; processing of contaminated meat from	Consumers become ill; lost work days; lost productivity and income; Meat packing enterprise loses reputation resulting in lost	Provision of protective clothing; effective use of disinfectants; effective sanitary inspections leading to required standards being met; effective	

Table F-3. Poultry & meat packing (this activity is often combined with a Poultry and Meat Processing)				
Overall Potential Impact: HIGH (due to threat to human health threat)				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
	slaughter-house	sales, lost revenue and loss of job	regulatory animal and meat inspection; assurance that carcasses and meat joints delivered are free of contamination and have been refrigerated adequately	
Contaminated groundwater and surface water	Improper disposal of bones and fat	Illness	Ground waste bone and fat into flour for animal feed (see remarks).	Current ban on using such flour as animal feed in other countries and other places due to threat of spongiform encephalopathy (BSE-mad cow disease) which can result in deadly Creutzfeldt-Jakob (CJD) disease in humans for those consuming meat of infected animals
Disease	Improper disposal of wastes into municipal disposal sites providing ideal habitat for vermin.	Lost workdays and income.	Appropriate disposal of waste.	
Illness	Canning uses lead solder for can seams.	Lead (Pb), a carcinogen, is cumulative in humans.	Use tin (Sn) for soldering or adopt other appropriate sealing methods.	
Solid waste	Canning material scrap.	Wasted resource.	Recycle back to processor.	
Probable Residual Impact Assuming Full Mitigation: NONE				

Table F-4. Dairy				
Overall Potential Impact: HIGH (primarily due to human health threat)				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Contribution to surface water pollution/ Wastewater	Silk solids (e.g. protein, fat, carbohydrates, and lactose) Salting activities during cheese	Significant organic content, high salinity levels; other pollutants: acids, alkali, and detergents, etc. as well as	To prevent contamination of wastewater: -Avoid milk, product, and by-product losses;	

Table F-4. Dairy				
Overall Potential Impact: HIGH (primarily due to human health threat)				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
		pathogenic microorganisms and viruses	-Install grids to reduce or avoid the introduction of solid materials into the wastewater drainage system; -Adopt best-practice methods for facility cleaning systems, using approved chemicals and / or detergents with minimal environmental impact and compatibility with subsequent wastewater treatment processes	
Soil, groundwater and surface water pollution/ Solid Waste	Production processes	Nonconforming products and product losses, grid and filter residues, sludge from centrifugal separators and wastewater treatment, and packaging waste	-Where possible and subject to sanitary requirements, segregate solid process waste and non-conforming products; -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 - Plastic waste from packaging cuttings can be reused, or should be sorted as plastic waste for off-site recycling or disposal, etc.	
Air Pollution/ Air Emissions <ul style="list-style-type: none"> Dust Odor 	Dairy processing activities Dairy processing facilities are related to on-site wastewater treatment facilities, in addition to fugitive odor emissions from	Fine milk powder residues in the exhaust air from the spray drying systems and bagging of product	Installation of exhaust ventilation equipped with dry powder retention systems (e.g. cyclones or bag filters) -Ensure wastewater treatment facilities are properly designed and maintained for the anticipated wastewater load; - Keep all working and storage	

Table F-4. Dairy				
Overall Potential Impact: HIGH (primarily due to human health threat)				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
	filling/emptying milk tankers and storage silos		areas clean; - Empty and clean the fat trap frequently (e.g. daily emptying and weekly cleaning); -Minimize stock of waste and by-products and store for short periods in cold, closed, and well-ventilated rooms	
Energy consumption	Dairy processing facilities consume considerable amounts of energy	Stress on natural resources	-Reduce heat loss by : - Using continuous, instead of batch, pasteurizers; - Partially homogenizing milk to reduce the size of heat exchangers; - Improve cooling efficiency	Approximately 80% of the energy requirements are for thermal uses to generate hot water and produce steam for process applications (e.g. pasteurization, evaporation, and milk drying) and cleaning purposes. The remaining 20% is used as electricity to drive processing machinery, refrigeration, ventilation, and lighting
Probable Residual Impact Assuming Full Mitigation: NONE				

Table F-5. Vegetable oil processing				
Overall Potential Impact: LOW				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Soil, groundwater and surface water pollution/ Solid waste and by-products	Vegetable oil processing activities generate significant quantities of organic solid waste and by-products. . Other solid wastes from the vegetable oil manufacturing process include soap stock and spent acids from chemical		-Use uncontaminated sludge and effluent from on-site wastewater treatment as fertilizer in agricultural applications; -Dispose of contaminated sludge from wastewater treatment at a sanitary landfill or by incineration.	The amount of waste generated depends on the quality of the raw materials and the use or reprocessing of the discarded materials into commercially viable by-products

Table F-5. Vegetable oil processing				
Overall Potential Impact: LOW				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
	refining of crude oil; spent bleaching earth containing gums, metals, and pigments; deodorizer distillate from the steam distillation of refined edible oils; mucilage from degumming; and spent catalysts and filtering aid from the hardening process		- Reduce product losses through better production control (e.g. monitor and adjust air humidity to prevent product losses caused by the formation of molds on edible materials)	
Contribution to surface water pollution/ Wastewater	Oil washing and neutralization (waters contain organic, high content of suspended solids, organic nitrogen, and oil and fat, and may contain pesticide residues from the treatment of the raw materials)		<ul style="list-style-type: none"> -Use emulsion breaking techniques to segregate high BOD and COD oils from wastewater; - Use grids to cover drains in the production area and to prevent solid wastes and concentrated liquids from entering the wastewater stream; - Select disinfection chemicals to match the cleaning operation being applied on the process equipment to the type of problem; - Apply cleaning chemicals using the correct dose and application; -When feasible, replace phosphoric acid with citric acid in degumming 	
Water consumption	Vegetable oil facilities require significant amounts of water for crude oil production (cooling water), chemical neutralization processes, and subsequent washing and	Stress on water resources	<ul style="list-style-type: none"> - When economically viable, consider the use of physical refining instead of chemical refining to reduce water consumption; - Recover condensate from 	

Table F-5. Vegetable oil processing				
Overall Potential Impact: LOW				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
	deodorization		heating processes and reuse; - Close the cooling water circuit and re-circulate cooling waters	
Air pollution/ Air Emissions <ul style="list-style-type: none"> • Particulate matter • Volatile Organic Compounds (VOCs) • Exhaust Gases 	Vegetable oil processing Dust: - from processing of raw materials, including cleaning, screening, and crushing Use of oil-extraction solvents, normally hexane	Combustion byproducts such as NOx, SOx, PM, volatile organic compounds (VOCs), and greenhouse gases (CO and CO ₂)	To prevent and control dust: - Ensure proper maintenance of cleaning, screening, and crushing equipment to reduce emissions of fugitive dust; - Reduce odor emissions with a caustic, alkaline, or ozone scrubber system To prevent and control VOCs: - Ensure the efficient recovery of solvent by distillation of the oil from the extractor; - Management strategy is a reduction in energy demand, use of cleaner fuels; - Application of emissions controls, where required, etc.	
Water and energy consumption	Heating of water and producing steam for process applications (especially for soap splitting and deodorization) and cleaning processes Refrigeration and compressed air	Stress on water and other natural resources	To use energy and water save technologies and machinery	
Illness	Cold pressed oil contains high amounts of fatty acids and pesticide residues.	Severe diseases resulting in lower labor efficiency and income	Use alternative pressing process	
Injuries	Open machinery	Lost productivity, work days and income.	Safety instructions; safety clothing where appropriate (e.g. hard hats); protective guards on all machinery.	

Table F-5. Vegetable oil processing				
Overall Potential Impact: LOW				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Probable Residual Impact Assuming Full Mitigation: NONE				

Table F-6. Sugar manufacturing				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Soil, groundwater and surface water pollution/ Solid waste and by-products	Mainly, from primary treatment of raw materials: leaves from beet, press mud, plant with the raw material Other solid wastes from the sugar manufacturing process include spent filter material		<ul style="list-style-type: none"> - Use beet leaves and roots as an energy-rich feed; - Collect waste products, (e.g. beet tops from the washing process) for use in by-products or as animal feed; - Convert beet pulp into feed (e.g. for cattle); - Remove soil and earth from the beet while in the field and before transport to reduce the risk of spreading pesticide residues; -Compost organic solids from press mud to make high-quality organic manure for agricultural production 	The amount of waste generated depends on the quality of the raw materials themselves and on the initial cleaning in the field. The generation of higher quality waste can provide opportunities for reprocessing of otherwise discarded raw materials into commercially viable by-products (e.g. paper making and particle board manufacturing)
Contribution to surface water pollution/ Wastewater	Wastewater has a high content of organic material and subsequently a high, particularly because of the presence of sugars and organic material arriving with the beet Wastewater resulting from the washing of incoming raw materials may also contain crop pests, pesticide residues, and pathogens		<ul style="list-style-type: none"> - Reduce the organic load of wastewater by preventing the entry of solid wastes and concentrated liquids into the wastewater stream: <ul style="list-style-type: none"> o Implement dry pre-cleaning of raw material, equipment, and production areas before wet cleaning o Allow beet to dry on field if possible, o Prevent direct runoff to watercourses, especially from 	Techniques for treating industrial process wastewater in this sector include preliminary filtration for separation of filterable solids; flow and load equalization; sedimentation for suspended solids reduction using clarifiers; biological treatment, typically anaerobic followed by aerobic treatment, for reduction of soluble organic matter, etc.

Table F-6. Sugar manufacturing				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Water Consumption	Sugar manufacturing requires considerable quantities of high quality water for raw material cleaning, sugar extraction, final sugar washing, and cooling and cleaning equipment. Steam is essential to the evaporation and heating of the various process steps in sugar processing	Stress on water resources	tank overflows Application of water saving technologies, where possible	
Air pollution/ Air emissions	<ul style="list-style-type: none"> - Dust is generated from unpaved access roads and areas, and sugar drying or packing activities - Odor emissions are generated from beet processing activities and storage facilities. - Beet factory juice clarification produces a sweet odor, which can be irritating. - Inadequate cleaning of the raw material may result in fermented juice, which will also create a foul smell 		<p>Particulate Matter and Dust:</p> <ul style="list-style-type: none"> - Use wet scrubbers to remove dust from drying and cooling of sugar; - Reduce fugitive dust from roads and areas by cleaning and maintaining a sufficient level of humidity; - Install ventilation systems with filters on transport systems for dry sugar and on sugar packing equipment <p>Odor:</p> <ul style="list-style-type: none"> - Keep beet processing and storage facilities clean to avoid the accumulation and fermentation of juice; - Use wet scrubbers to remove odors with a high affinity to water (e.g. the ammonia emitted from the drying of beet pulp); - Ensure that vapor from the carbonation section is emitted from a stack of sufficient height 	
Energy Consumption	Sugar manufacturing facilities	Stress on water and other	Industry specific measures:	Reducing energy consumption

Table F-6. Sugar manufacturing				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
	use energy to heat water and produce steam for process applications and cleaning purposes	natural resources	<ul style="list-style-type: none"> - Ensure even energy consumption by management of batch processes (e.g. centrifuges, vacuum pans) to schedule energy demand and equalize steam demand on the boilers; - Combine drying of beet pulp with the main energy system in the facility; - Select the operating conditions of the boiler and steam turbine system to match the heat-power ratio of the utility system to that of the facility 	will have a positive effect on air emissions
Probable Residual Impact Assuming Full Mitigation: LOW				

Table F-7. Food and beverage processing				
Overall Potential Impact: LOW				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Soil, groundwater and surface water pollution/ Solid waste	<p>Raw materials</p> <p>Food and beverage processing activities generate significant volumes of organic solid waste in the form of inedible materials and rejected products from sorting, grading and other production processes</p> <p>Where meat products are the raw material, solid waste generated during processing may include organic materials that have the potential to significantly impact food</p>	Environmental pollution	<ul style="list-style-type: none"> - Minimize inventory storage time for raw materials to reduce losses from putrefaction; - Monitor and regulate refrigeration and cooling systems during storage and processing activities to minimize product loss, optimize energy consumption, and prevent odors; - Monitor and optimize process yields, e.g. during manual grading or cutting activities, and encourage the most productive employees to train others in 	

Table F-7. Food and beverage processing				
Overall Potential Impact: LOW				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
	safety due to the proliferation of pathogenic microorganisms		efficient processing; - Clean, sort, and grade raw foodstuffs at an early stage in order to reduce organic waste and substandard products at the processing facility - Collect and reuse rejected raw materials for manufacturing other products; - Provide leak-proof containers for collected solid and liquid waste-	
Surface and groundwater pollution/ Wastewater	Effluents from food and beverage processing may have a high biochemical and chemical oxygen demand resulting from organic wastes entering into the wastewater stream, and from the use of chemicals and detergents in various processes, including cleaning, pathogenic bacteria, pesticide residues, suspended and dissolved solids such as fibers and soil particles, nutrients and microbes, and variable pH		The effluent load should be reduced by preventing raw materials, intermediates, product, by-product and wastes from unnecessarily entering the wastewater system	Techniques for treating industrial process wastewater in this sector include grease traps, skimmers or oil water separators for separation of floatable solids; flow and load equalization; sedimentation for suspended solids reduction using clarifiers; biological treatment, typically anaerobic followed by aerobic treatment, for reduction of soluble organic matter; composting or land application of wastewater treatment residuals of acceptable quality may be possible
Water consumption	Food and beverage processing activities, e.g. washing, internal transport of raw materials using water, cooling of blanched foods, and general equipment cleansing	Stress on water resources	- Minimize water consumed during production processes: o Optimize product conveying systems to reduce contact of raw material and product with water; - Optimize process line	

Table F-7. Food and beverage processing				
Overall Potential Impact: LOW				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
			<p>operations to avoid spills of raw materials and water, reducing the need to wastewater treatment and associated energy consumption;</p> <p>- Reuse water streams in the production processes to the maximum extent possible while avoiding water contamination or compromising food safety:</p> <ul style="list-style-type: none"> o Adopt best-practice methods for plant cleaning chemicals and (or) detergents with minimal environmental impact and compatibility with subsequent wastewater treatment processes 	
Thermal energy consumption	Heating, cooling, refrigeration	Stress on natural resources	<ul style="list-style-type: none"> o Insulate refrigeration room/areas and use of automatically closing doors and airlocks o Insulate refrigeration rooms / areas -Optimize plant processes for energy efficiency o Reduce the size of refrigeration rooms where feasible, but still taking food safety into consideration o Avoid refrigeration of fruits, vegetables and byproducts intended for animal feed by storing outside in clean covered areas or in containers, when climate conditions and plant design allow 	

Table F-7. Food and beverage processing				
Overall Potential Impact: LOW				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Air pollution/ Air Emissions				
<ul style="list-style-type: none"> Particulate matter 	Particulate matter may arise from solids handling, solid reduction and drying.		<p>To prevent and control <i>particulate matter</i> emissions:</p> <ul style="list-style-type: none"> - Cover skips and vessels, and stockpiles, especially outdoors; - Where enclosure is not feasible, use sprays, windbreaks, sweeping, sprinkling, and other stockpile management techniques to suppress dust; 	
<ul style="list-style-type: none"> Odor 	<p>Odor may be released by thermal processing steps such as steam peeling, blanching and dehydrating and by microbial action in stored solid waste.</p> <p>In meat processing, odor may also be emitted from cooking and smoking activities</p>		<p>To prevent and control point source <i>odor</i> emissions:</p> <ul style="list-style-type: none"> - If the plant is in close proximity to residential areas consider the use of wet scrubbers to remove odor emissions. Recommended techniques to prevent and control fugitive emissions of odor include: - Minimize storage duration for solid waste to avoid putrefaction; - Operate facilities under partial vacuum to prevent fugitive odor emission; - Regular inspection of chilling and freezing equipment to monitor loss of refrigerants 	
Probable Residual Impact Assuming Full Mitigation: NONE				

Table F-8. Breweries
Overall Potential Impact: LOW

Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Energy consumption	Brewery processes are relatively intensive users of both electrical and thermal energy.	Stress on natural resources	<ul style="list-style-type: none"> - Install energy and water meters to measure and control consumption throughout the facility; - Use high-gravity brewing, where beer is produced at greater than sales strength and diluted to the finished product alcohol content before packaging; - Control and optimize evaporation in wort boiling - Optimize heating of tunnel pasteurizers and consider pasteurization unit control; - Optimize refrigeration system operations; - Optimize the operation of large electric motors by: <ul style="list-style-type: none"> o Examining opportunities to install variable speed drives, particularly for secondary refrigerant and water pumps 	Specific energy consumption in a brewery can vary from 100-200 mega joules per hectoliter (MJ/hl), depending on size, sophistication, etc.
Water consumption	In addition to water for the product, breweries use water for heating and cooling, cleaning packaging vessels, production machinery and process areas, cleaning vehicles, and sanitary water. Water is also lost through wort boiling and with spent grains	Stress on water resources	<ul style="list-style-type: none"> - Limit water used in wort cooling to the volume needed for mashing; - Allow the storage level of recovered water tanks to fluctuate, thereby using storage capacity. - Implement water conservation measures in the bottle washers - Optimize cleaning plants and procedures to avoid unnecessary losses of water and cleaning chemicals, etc. 	More than 90% of beer is water and an efficient brewery will use between 4–7 liters of water to produce 1l liters of beer
Contribution to surface water pollution/ Wastewater			<ul style="list-style-type: none"> To reduce organic load: - Undertake procedural improvements to reduce the 	

Table F-8. Breweries				
Overall Potential Impact: LOW				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
			amount of residual beer; - Avoid overfilling of fermenting vessels which causes loss of partially-fermented wort and yeast; - Ensure sedimentation of caustics from the bottle washer	
Soil, groundwater and surface water pollution/ Solid waste and by-products	Beer production results in a variety of residues, such as spent grains		- Optimal use of raw materials to increase yield and reduce generation of wastes, including: o Optimizing milling of the grist o Optimizing lautering, incl. sufficient sparging of the spent grains; o Recovery of beer from surplus yeast o Collection and reuse of residual beer; o Collecting and reusing yeast from the fermentation process as a by-product	These residues have a commercial value and can be sold as byproducts to the agricultural sector
Air pollution/ Air emissions • Odor • Dust	Odor and dust are the most significant air emissions from breweries. The wort boiling process is the main source of odor emissions from a brewery. The main sources of <i>dust</i> emissions are the use and storage of grains & sugar		To reduce <i>odor</i> emissions from wort boiling <i>Dust</i> generated from the unloading of raw materials and transport of malt and adjuncts should be conveyed to the mash or adjunct kettle and the extract recovered	Dust arising from malt and adjuncts may be used as animal feed
Probable Residual Impact Assuming Full Mitigation: NONE				

Table F-9. Vegetable processing and canning				
Overall Potential Impact: LOW				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
Water pollution	Residue from vegetable and fruits allowed to be dumped into surface waters.	Damage to aquatic ecosystems (high organic resulting in dissolved oxygen depletion).	Compost vegetative waste.	
Soil, groundwater and surface water pollution/ Solid waste	Raw material, canning material scrap, etc		Recycle metal back to metal processor.	
Diseases/ illness	Canning uses lead solder for can seams	Lead (Pb), a carcinogen, is cumulative in humans	Use tin (Sn) for soldering or adopt other appropriate sealing methods.	
Injuries	Open machinery	Lost labor efficiency & income	Safety instructions; safety clothing where appropriate (e.g. hard hats); protective guards on all machinery.	
Residual Impact Assuming Full Mitigation: NONE; Risk: LOW				

Table F-10. Frozen food production				
Overall Potential Impact: MODERATE (primarily due to human health threat)				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
Emission of greenhouse gases	Refrigeration and freezing units utilizing Freon/or ammonia	Contribution to global warming & increase in UV radiation	Convert refrigerants from ozone depleting substances to hydrofluorocarbon	
Food contamination	Poor sanitary conditions including lack of protective clothing and ineffective maintenance; contaminated raw materials	Consumers become ill; lost work days; lost productivity and income; enterprise's reputation leads to lost business	Provision of protective clothing; proper washing up with disinfectants; effective sanitary inspections leading to required standards being met; effective inspection of raw materials	
Injuries	Open machinery	Lost productivity, work days and income	Safety instructions; safety clothing where appropriate (e.g. hard hats); protective guards on all machinery	
Residual Impact Assuming Full Mitigation: NONE; Risk: MODERATE				

Table F-11. Flour milling				
Overall Potential Impact: LOW				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
Soil and water pollution/ Solid waste	Wheat husks left from milling dumped at municipal disposal site		Recover bran; Use for animal feed	
Injuries	Open machinery.	Loss of labor efficiency and income.	Safety instructions; safety clothing where appropriate (e.g. hard hats); protective guards on all machinery.	
Illness	Flour dust	Respiratory irritation	Provide masks to workers	
Residual Impact Assuming Full Mitigation: NONE; Risk: LOW				

Table F-12. Warehousing				
Overall Potential Impact: LOW				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
Only those during siting, construction and decommissioning phases.				
Residual Impact Assuming Full Mitigation: NONE; Risk: LOW				

Table F-13. Markets				
Overall Potential Impact: MODERATE				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
Illness	Vermin (rats)	Spreading of disease resulting in lost workdays, sales and income	Regular inspection of markets and extermination of vermin; maintenance of high sanitary standards;	Market stall keepers in Bishkek mention presence of rats due to unsanitary conditions.
	Unrefrigerated meat and dairy products.	Lost labor efficiency and income	Refrigeration of meat and dairy products	
Air pollution	Refrigeration and freezing units utilizing Freon/or ammonia	Contribution to ozone depletion	Convert refrigerants from ozone depleting substances (NH ₃ and chlorofluorocarbons) to a hydrofluorocarbon.	
Residual Impact Assuming Full Mitigation: NONE; Risk: LOW - MODERATE				

Annex G. Impacts, Causes, Consequences and Mitigation measures for Contraction activities & sub-projects in Manufacturing Sector

- G-1 Construction activities
- G-2 Construction material extraction*
- G-3 Cement and lime manufacturing*
- G-4 Ceramics manufacturing*
- G-5 Glass manufacturing*
- G-6 Textile manufacturing*
- G-7 Tanning and leather finishing*
- G-8 Soap and detergent manufacturing
- G-9 Printing*
- G-10 Sawmilling and manufactured wood products*
- G-11 Board and particle-based products manufacturing*
- G-12 Pharmaceuticals and biotechnology manufacturing*
- G-13 Semiconductors and other electronics manufacturing*
- G-14 Pulp and paper mills manufacturing*
- G-15 Surface treatment of metals and plastics*
- G-16 Metal, plastic and rubber products manufacturing*
- G-17 Foundries*

*Resource: Environmental, Health, and Safety Guidelines. World Bank Group, 2007.
<http://www.ifc.org/ifcext/sustainability.nsf/Content/EnvironmentalGuidelines>

Table G-1. Construction activities				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
Planning Phase:				
Loss of biodiversity	Poor location analysis not taking into account important biophysical values.	Loss of flora and fauna.	Location in areas that are not high priority for biodiversity protection.	
Loss of cultural features	Poor location analysis not providing consideration to cultural values.	Loss of important cultural sites and structures.	Location in areas of little or no cultural significance.	Public participation is a requirement for all EIAs and if properly conducted during EIA will ensure input required to select appropriate alternative sites.
Socially unacceptable	Poor location analysis not taking into consideration local communities' lifestyle, movement patterns and values.	Nuisance factor to local communities; loss of peace and quiet; loss of access to other areas or sites (e.g. school children may have to walk greater distances due to loss of direct route to school).	Location in areas where noise, odor or aesthetics will not be a problem; location to be selected which doesn't interfere with important access (e.g. to schools).	Public participation is a requirement for all EIAs and if properly conducted during EIA will ensure input required to select appropriate alternative sites (and <i>modus operandi</i>) for enterprise.
Construction Phase :				
Soil erosion	Vegetation and topsoil is removed for initial construction and access, exposing bare soil that is vulnerable to erosion, particularly in rainy periods.	Further soil erosion off-site and downstream; increased sediment loads in receiving streams resulting in aquatic habitat changes.	Ensure awareness by workers; adopt appropriate soil protection techniques; ensure exposed soil surfaces are kept to a minimum and for short periods of time; conserve topsoil, recover and replant when construction is completed.	If possible construction should occur in dry periods or seasons, particularly in situations where soil erosion could be a problem.
Soil pollution	Spilled and dumped fuels, and other chemicals. Ineffective on-site sewage treatment during construction phase.	Loss of soil productivity. Contaminated groundwater.	Environmental awareness; training in handling and storage of fuels, lubricants and chemicals; provision of proper on-site storage facilities.	
Water pollution	Spilled and dumped fuels and other chemicals.	Contaminated groundwater and surface water resulting in contaminated drinking water and in the case of surface	Same as above. Provision of waste containing toilets which waste can be transferred to a municipal	

Table G-1. Construction activities				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
		water, damaged aquatic ecosystem.	treatment facility.	
Noise and dust	Vehicles and construction machinery; dirt access roads.	Nuisance factor to neighboring communities.	Operations during normal working hours only; access roads to be watered during dry periods.	
Loss of habitats and biodiversity	Construction activities	Noise pollution, disturbance on natural ecosystems, etc.	-To avoid or minimize construction and operational activities during breeding and migration periods - Consideration of alternative locations, where possible - Careful timing of works and work seasonally, as appropriate: no construction during breeding season - Where possible, to fence the area under construction to lessen even occasional disturbance on habitats and biodiversity -Inform personnel about importance of adjacent environmentally important area, if any	
Solid waste	Littering of unused construction materials and workers personal garbage.	Unightly and remnant construction materials could pose a safety hazard.	Effective disposal of materials and garbage in designated waste disposal sites.	
Loss of access	Construction site may have formerly been used as an access for local population (and vehicles) for various sections of the community.	Nuisance and possibly economic hardship.	During planning phase ensure that local people are aware of restrictions during construction and alternative arrangements for access are provided.	Public participation during planning phase should identify this and similar conflicts.
Injuries	Inadequate safety procedures for workers; inadequate signage and construction	Injury / death resulting in lost work days (for construction workers and general public;	Ensure construction workers are given safety instruction; ensure safety officers on site;	

Table G-1. Construction activities				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
	activities exposed where public can interface with such.	lost income.	ensure effective signage for the public and ensure that all exposed construction areas are barricaded from public access.	
Decommissioning Phase: (it is unlikely that any of the enterprises will undergo decommissioning in a 25-50 period from initial start up or refurbishment but if such should occur then the listed impacts should be considered).				
Same as above for construction plus:	See above	See above	See above	
Waste	Concrete, blocks, steel, glass will result from demolition; old equipment will be dismantled.	Public safety hazard. Waste of resources.	Removal and recycling or effective disposal of all toxic materials; complete demolition after recycling useful materials; removal to a designated and environmentally safe disposal site and burial of clean and inert materials.	
Aesthetics		Unsightly site (as are many industrial sites from former Soviet times).	Following removal of all materials (see above), site to be formed (topsoil where relevant and feasible) and landscaped, where appropriate, to suit surrounding areas.	
Soil erosion	As for construction phase above.			
Safety	As for construction phase above.			

Table G-2. Construction material extraction				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Air pollution/ Air Emissions <ul style="list-style-type: none"> • Particulate matter 	The principal source of air emissions is fugitive dust from	Impact to human health, damage to environment	-Land clearing, removal of topsoil and excess materials,	

Table G-2. Construction material extraction				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
<ul style="list-style-type: none"> ○ Dust Other Air Pollutants <ul style="list-style-type: none"> • Combustion by-products • Toxic and nontoxic gases • NO₂, CO and NO 	earth works and materials handling and transport activities: crushing–grinding, drilling, blasting and transport Vehicles and other combustion sources installed in the quarrying site Blasting activities Explosions		location of haul roads, tips and stockpiles should be planned with due consideration to meteorological factors; -Dust emissions from drilling activities should be controlled at the source by dust extractors, collectors; -Internal roads should be adequately compacted; -A speed limit for trucks should be considered; Exposed surfaces of stockpiled materials should be vegetated -Alternatives to blasting, -If blasting is necessary, planning of the blasting (should be implemented; -The correct burning of the explosive should be ensured by minimizing the presence of excess water and avoiding incorrect or incomplete mixing of explosive ingredients	
Water consumption Hydrology	Diamond-wire cutting activities, aggregate-washing plants, and dimension stone quarrying activities Flow diversions, water intake, and changes to the drainage pattern	Stress on natural resources Alteration of surface water regime	- Reduce water consumption; through recirculation and reuse, implementing closed-circuit systems from sedimentation ponds to the quarrying process - Quarry pond dredging activities should be designed and implemented to minimize drawdown with consideration of potential impacts to surface and groundwater resource flow	

Table G-2. Construction material extraction				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Wastewater	Dewatering of the quarrying pit, diamond-wire cutting and surface water runoff		and availability, including potential ecological impacts -Construction of a dedicated drainage network; -Reduce water consumption	Construction materials extraction operations do not typically generate point sources of effluents or emissions
Hazardous Materials	Use, storage and transfer of varying quantities of fuels and lubricants; Impurities and trace components included in the exploited (waste) rocks (e.g. asbestos or heavy metals or minerals)	Soil and surface water & groundwater pollution Acidic runoff	Operational design and planning should include procedures for the reduction of waste production; -Topsoil, overburden, and low-quality materials should be properly removed, stockpiled near the site, and preserved for rehabilitation; -Hazardous and non- hazardous waste management plans should be developed and adopted during the design and planning phase	
Solid waste generation		Surface and groundwater pollution, soil pollution	- Cleanup and maintenance in receiving areas can reduce this waste and allow material spills to be collected and added to the raw materials; - Paving the receiving areas; - Cleanup and maintenance in receiving areas can reduce this waste and allow material spills to be collected and added to the raw materials	
Noise and Vibrations • Noise	At extraction activities, including construction	Hearing loss (hypoxia)	--Installation of proper sound barriers and (or) noise	

Table G-2. Construction material extraction				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
<ul style="list-style-type: none"> Vibration 	<p>material and dimension stone quarrying. drilling, breaking, crushing and handling—moving, screening, and transport. In dimension stone quarrying, flame-jet cutting is a specific noise source</p> <p>Mainly blasting activities; crushers and plant screening equipment; minor emissions are commonly associated with use of rock hammers</p>		<p>containments</p> <ul style="list-style-type: none"> -Use of rubber-lined or -Installation of natural barriers at facility boundaries (e.g. vegetation curtains or soil berms); -Optimization of internal-traffic routing, particularly to minimize vehicle-reversing needs; -A speed limit for trucks should be considered <p>-Vibration and overpressure control with appropriate drilling grids;</p> <p>-Development of blast design, including a blasting-surfaces survey, to avoid over confined charges</p>	
Land conversion	Excavation activities at construction materials extraction sites	Topographical and land-cover changes; clearing of preexisting vegetation	<ul style="list-style-type: none"> -Selection of appropriate low-impact extraction (e.g. excavation, quarrying, and dredging) methods; -Establishment of buffer zones from the edge of extraction areas, considering the characteristics of the natural habitats and the type of extraction activities; -To reduce the consumption of land area and, consequently, the loss of soil; - The land should be appropriately rehabilitated. --Hydrological systems should 	Opportunities to create ecologically valuable habitats should be considered (e.g. small lakes and pools with a complex shoreline and shallow water zones, after dredging or areas for natural succession

Table G-2. Construction material extraction				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
			be restored	
Land instability	Large-scale spoil-material disposal, water ponds, or mined land	Landslide or collapse that could cause catastrophic incidents in surrounding populated area	<ul style="list-style-type: none"> - To undertake a geological and hydro-geological survey ; -Geological and geotechnical control programs in large areas, specifically focused on long-term land stability; -Geo-technical monitoring of slopes, disposal sites 	
Residual Impact Assuming Full Mitigation: LOW; Risk: LOW - MODERATE				

Table G-3. Cement and lime manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Air Pollution/ Air Emissions (Particulate matter, NO _x , SO ₂ , CO ₂ emissions)	Handling and storage of intermediate and final materials, and by the operation of kiln systems, clinker coolers and mills	Contribution to global warming/ Wide range of health impacts (mortality, respiratory disease, cardiovascular disease, eye irritation, and others)	<ul style="list-style-type: none"> -Use of a simple layout for materials handling operations to reduce the need for multiple transfer points · Storage of crushed and preblended raw materials in covered or closed bays · Implementation of routine plant maintenance and good housekeeping to keep small air leaks and spills to a minimum; · Conduct material handling (e.g. crushing operations, raw milling, and clinker grinding) in enclosed systems maintained under negative pressure by exhaust fans. · Implementation of automatic bag filling and handling 	

Table G-3. Cement and lime manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
			systems to the extent possible · Using electrostatic precipitators (ESPs) or fabric filter systems (bag houses) to collect and control fine particulate emissions in kiln gases	
Energy consumption and fuels	Kilns, coolers, fuels	Exhausting of natural resources	- Use of dry process kilns - No toxic emissions are generated from the firing of waste in cements kilns; - Adequate monitoring should be conducted when waste fuels are being fired at cement plants	-For new systems, optimizing energy efficiency in the design of the installation, unit or system and in the selection of processes for existing systems, optimizing the energy efficiency of the system through its operation and management, including regular monitoring and maintenance
Soil and water pollution from wastewater	Utility operations for cooling purposes in different phases of the process (e.g. bearings, kiln rings)	Threat to human health and damage to aquatic environment	Reduce water consumption	
Solid waste generation	Clinker production waste, mainly composed of spoil rocks, which are removed from the raw materials during the raw meal preparation; kiln dust removed from the bypass flow and the stack, if it is not recycled in the process	Air, soil and water pollution	Appropriate waste water management	
Noise	Raw material extraction, grinding and storage; raw material, intermediate and final product handling and transportation; and operation of exhaust fans.	Hearing loss (hypoxia)	- Selecting equipment with lower sound power levels - Improving the acoustic performance of constructed buildings, apply sound insulation - · Limiting the hours of operation for specific pieces of	

Table G-3. Cement and lime manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
			equipment or operations, especially mobile sources operating through community areas · Re-locating noise sources to less sensitive areas to take advantage of distance and shielding	
Residual Impact Assuming Full Mitigation: MODERATE; Risk: HIGH				

Table G-4. Ceramics manufacturing				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Air pollution/ Air Emissions <ul style="list-style-type: none"> • Particulate matter • SO₂ emissions 	Storage and handling of raw materials and during firing or spray drying of ceramics Handling of raw materials; drying, and finishing operations Depends on the sulfur content of the fuel and certain raw materials (e.g. gypsum, pyrite, and other sulfur compounds)	Human health impacts	Arrange barriers for wind protection (if raw material is stored in open piles; -Use of wet dust separators to treat emissions from spray drying and glazing processes in fine ceramic manufacturing. -Use of fuels with a low sulfur content, such as natural gas or liquefied petroleum gas; -Use of low-sulfur raw material -Reducing the nitrogen content	
Contribution to surface water pollution from wastewater	Preparation and casting units, and various process activities (e.g. glazing, decorating, polishing, and wet grinding		-Reduce water consumption; -Use dry off-gas cleaning systems; -Where practical, install waste glaze collection systems; -Install slip conveying piping systems; - Dewatering and disposal of	

Table G-4. Ceramics manufacturing				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
			residuals in landfills, or if hazardous in designated hazardous waste disposal sites	
Waste generation	Process waste originating from the manufacture of ceramic products mainly consists of different types of sludge, including sludge from process wastewater treatment, and process sludge resulting from glazing, plaster, and grinding activities. Other process wastes include broken ware from process activities: solids from dust treatments; spent plaster molds; spent sorption agents (limestone and limestone dust); and packaging waste	Surface and groundwater pollution, soil pollution	Enhancements related to such activities as : - Increasing the lifespan of plaster molds; - Installing electronic controls for the firing curve (to optimize the process and reduce the amount of broken ware); - Installing spray booths that allow reclaiming of excess glaze; - Reduce waste generation; - Internal reuse of cuttings, broken ware, used plaster molds, and other byproducts, including sludge - Recycle, as raw material, dust collected in abatement systems and through different process activities, in addition to cuttings and other process losses	<i>BATs to reduce solid process losses/solid waste</i> -Feedback of unmixed raw materials Feedback of broken ware into the manufacturing process -Use of solid process losses in other industries -Electronic controlling of firing applying optimized setting
Energy consumption	Operational process	Stress on natural resources	-Improve design of kilns and dryers -Applying a fuel switch in the kiln firing process	
Noise	Operational process	Hearing loss (hypoxia)	-Using silencers and slow rotating fans -Situating windows, gates and noisy units away from neighbors -Sound insulation of windows and walls	

Table G-4. Ceramics manufacturing				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
			-Closing windows and gates -Good maintenance of the plant	
Residual Impact Assuming Full Mitigation: LOW; Risk: MODERATE				

Table G-5. Glass manufacturing				
Overall Potential Impact: LOW				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Air pollution/ Air Emissions <ul style="list-style-type: none"> • Particulate matter • Dust • NO₂ • Greenhouse gas (CO₂) emissions • SO₂ emissions 	Container press and blow machines generate most emissions due to contact between molten glass (the “gob”) and equipment lubricants. Melting process: Raw materials transportation, handling, storage, and mixing Raw materials, cullet, fuels High furnace temperatures, and the oxidation of nitrogen contained in fuels Linked with the type of glass, the type of fossil fuels used, Depends on the sulfur content in the fuel and in the raw materials	Affects environment and human health	-To consider product light weighting in containers and tableware; - Increased cullet utilization; -Optimization of furnace design and geometry; -Use of fuels with low sulfur content; -Consideration of material charging patterns, grain size, and moisture optimization; - End-of-pipe prevention and control techniques to reduce dust and NO ₂ emissions; -Maximizing cullet use to increase energy efficiency and to limit the use of carbonate raw materials; -Reduction in the amounts of sodium or calcium sulfate in the batch materials	
Contribution to surface water pollution/ Wastewater	Processing	Aquatic environment deterioration	-Reduce water consumption; - Screening and sedimentation for suspended solids reduction	In general, emissions to the water environment are relatively low and there are

Table G-5. Glass manufacturing				
Overall Potential Impact: LOW				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
			using settling basins - Dewatering and disposal of residuals in landfills, or if hazardous in designated hazardous waste disposal sites	few major issues that are specific to the glass industry. Water is used mainly for cleaning and cooling and can be readily recycled or treated using standard techniques
Solid waste generation		Surface and groundwater pollution, soil pollution	- Paving the receiving areas; - Cleanup and maintenance in receiving areas can reduce this waste and allow material spills to be collected and added to the raw materials	Most activities of the glass industry produce relatively low levels of waste
Noise	High pressure in the cooling-mold process, raw material preparation, pressing and granulation processes, cutting, grinding	Hearing loss (hypoxia)	-Enclosure of units --Sound insulation of windows and walls -Closing windows and gates -Carrying out noisy (outdoor) activities only during the day -Good maintenance of the plant	
Energy consumption		Stress on natural resources	-Melting technique and furnace design; -Combustion control and fuel choice; -Cullet usage; -Waste heat boilers	
Residual Impact Assuming Full Mitigation: LOW; Risk: LOW				

Table G-6. Textile manufacturing				
Overall Potential Impact: HIGH (primarily due to toxic chemicals in effluent discharge)				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Hazardous materials <ul style="list-style-type: none"> Chemical Selection 	Pretreatment, dyeing, and other processes to provide the	Environmental pollution	- Potentially hazardous surfactants should be replaced	

Table G-6. Textile manufacturing				
Overall Potential Impact: HIGH (primarily due to toxic chemicals in effluent discharge)				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
and Use	final product with desired visual and functional properties		by biodegradable, where possible; - Appropriate storage and handling of hazardous materials	
Contribution to surface water pollution/ Wastewater	Wet operations, which are conducted during different parts of the textile manufacturing process	Damage to aquatic environment	- Control water usage; -Use of readily biodegradable; -Optimization of mechanical removal of water prior to the drying process; -Use of organic solvent washing for non-water soluble lubricants; - The oil separated should be collected to limit effluent contamination; -Use of hydrogen peroxide bleaching agent, instead of sulfur- and chlorine-based bleaches; -Use of automatic systems for dosing and dispensing dyes; -Conduct dyeing in high temperature conditions	Wastewater from textile manufacturing is typically alkaline and has high BOD (from 700 to 2,000 mg/l) and COD loads Pollutants in textile effluents include suspended solids, mineral oils (e.g. antifoaming agents, grease, spinning lubricants, non-biodegradable or low biodegradable surfactants other organic compounds, including phenols from wet finishing processes (e.g. dyeing), and halogenated organics from solvent use in bleaching. Effluent streams from dyeing processes are typically hot and colored and may contain significant concentrations of heavy metals
Water consumption	Use of freshwater, wastewater/sludge production, and energy used in heating	Exhausting of natural resources	Using mechanical dewatering equipment to reduce water content of the incoming fabric. -Use of water flow-control devices to ensure that water only flows to a process when needed	
Air pollution/ Air emissions	Coating and dyeing operations, include drying,	Damage to environment and human health	-Use of emissions control techniques (e.g. absorption and	

Table G-6. Textile manufacturing				
Overall Potential Impact: HIGH (primarily due to toxic chemicals in effluent discharge)				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
<ul style="list-style-type: none"> Dust Volatile Organic Compounds and other chemicals 	printing, fabric preparation and wastewater treatment residues Bale breakers, automatic feeders, separators and openers, mechanical conveyors, pickers and cards Stented frames, which are used in drying.		chemical scrubbing) -Enclosure of dust producing equipment, and use of local exhaust ventilation, etc. -Use printing pastes with no or low VOC emissions; -Installing and modifying equipment to reduce solvent use; -Adopting water-based methods for removing oil and grease from fabric instead of using volatile solvents	
Odors	Dyeing and other finishing processes, and use of oils, solvent vapors, formaldehyde, sulfur compounds, and ammonia		-Substituting odor-intensive substances with less impacting compounds; -Installing and modifying equipment to reduce use of odorous chemicals	
Energy consumption	Drying and curing operations and in activities involving wet treatments	Stress of natural resources	-Water temperature control (optimum at 65° C) and dryer automatic humidity control using sensors typically leads to energy reduction. - Consider efficient combination of operations, such as scouring and bleaching, to save energy and water	
Contribution to surface water pollution through generation of solid and liquid waste	Manufacturing wastewater contains trials, selvedge, trimmings, cuttings of fabrics, spent dyes, pigments,	Damage to environment	-Solid and liquid wastes should be effectively recycled or reused within the process or externally	

Table G-6. Textile manufacturing				
Overall Potential Impact: HIGH (primarily due to toxic chemicals in effluent discharge)				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
	printing pastes		-Dewatering and disposal of residuals in designated hazardous waste landfills	
Residual Impact Assuming Full Mitigation: LOW – MODERATE; Risk: MODERATE - HIGH				

Table G-7. Tanning and leather finishing				
Overall Potential Impact: HIGH (primarily due to toxic chemicals in effluent discharge)				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Contribution to surface water pollution/ Wastewater	The main releases to water originate from wet processing in the beam house, the lanyard, and the post-tanning operations	Damage to aquatic environment	Containment and treatment facilities to ensure that effluent discharges are within the established limits	
Water Consumption	Large tannery uses large amounts of water.	Stress on water resources	- Water re-use - To improve the matching of water flow to the requirements of the process and to use 'batch' versus 'running water' washes; - The use of short-float techniques can be achieved either by modifying the equipment to utilize short floats, or by installing modern tannery machines	In tanneries with poor water management only 50 % of the water consumed is actually used in the process.. With a combination of batch washing and short floats, savings of water consumption up to 70 % can be achieved, compared with a conventional process
Air pollution/ Air Emissions (organic solvents, VOC, sulfides, ammonia, dust, and odors)	The main releases to air are due to the dry-finishing processes, although gaseous emissions may also arise in all other parts of the tannery.	Damage to environment and human health	-Consider water-based formulations (containing low quantities of solvent) for spray dyeing; -Implement organic solvent-saving finishing techniques; - Use of adequate ventilation, followed by wet scrubbing;	

Table G-7. Tanning and leather finishing				
Overall Potential Impact: HIGH (primarily due to toxic chemicals in effluent discharge)				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
			- Use of a centralized system, employing cyclones, scrubbers, and / or bag filters, as needed -Ventilate tannery areas and control exhaust from odorous areas	
Soil and underground water pollution arising from solid waste	The main sources of solid wastes originate from fleshing, splitting and shaving.		-Reduce inputs of process agents to the practical extent; -Segregate different waste/residue fractions to facilitate recovery and re-use; -Dispose of non-recoverable and non-recyclable waste and sludge by appropriate methods	
Hazardous Materials (biocides, halogenated organic compounds, etc.)	Tanning and leather finishing processes		- Where possible, substitution of hazardous materials; -To maintain an inventory of inputs and outputs, their fate in processes and releases -To measure appropriate parameters to monitor the environmental releases	
Energy consumption	Forced drying of leather is among the most energy intensive processes in the tannery	Exhausting of natural resources	Considerable reductions in energy consumption can be achieved by optimizing the mechanical dewatering processes prior to drying	
Residual Impact Assuming Full Mitigation: LOW – MODERATE; Risk: MODERATE - HIGH				

Table G-8. Soap and detergent manufacturing				
Overall Potential Impact: MODERATE				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
Construction phase				
Dust, noise, mud due to use of heavy machinery	Site preparation and construction of building	Affect humans	To minimize area under construction activities,	

Table G-8. Soap and detergent manufacturing				
Overall Potential Impact: MODERATE				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
			Scheduling of work activities To keep noise level within permissible level to not disturbed neighbors	
Generation of excavated soil, debris, construction wastes	Site preparation and construction of building	May be dumping into bare lands, water bodies and drains	All solid wastes should be collected and properly disposed	
Hazardous material (fuel, lubricants, et.)	Site preparation and construction of building	Soil & water pollution, fire hazards		
Operation phase				
Air pollution (dust, VOC)	Combustion of fuel		Emission values to comply with established limits	
Odor		Nuisance to the nearby inhabitants	Channeling of flue and odor gases at possible extent	
Solid & hazardous wastes	Processing	Visual impacts & Risk of contamination of surface water	Appropriate disposal of hazardous wastes and their further neutralization Petroleum hydrocarbons and other chemicals to have secondary containment	The secondary containment shall have a storage capacity of 110% of the capacity of storage tank
Contribution to surface water pollution/ Wastewater (the most significant, -phosphates)	Processing	Phosphor the most significantly contributes to eutrophication which remains one of the most important threats to fresh and marine waters	Effluent values to comply with established limits	The EC, on the base of Art. 16 Regulation (EC) No 648/2004 of the European Parliament and of the Council of 31 March 2004 on detergents, concerning the use of phosphates, recalls Member States may proceed with measures to replace phosphate-based detergents where this can be justified on environmental grounds (currently, in Europe only in 6 counties are 100% used P-free detergents; these are Germany, Austria, Luxemburg, Italy, Ireland,

Table G-8. Soap and detergent manufacturing				
Overall Potential Impact: MODERATE				
Potential Impacts	Causes	Consequences	Mitigation Required	Remarks
				Netherlands, Belgium, In Slovenia -95% use)
Hazardous material	Processing		Appropriate handling and storage of hazardous material to minimize risk of pollution and accidental spill	
Residual Impact Assuming Full Mitigation: NONE; Risk: LOW				

Table G-9. Printing				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Air pollution/ Air Emissions (Volatile Organic Compounds (VOC), other toxic compounds, particulate matter)	Evaporation of the fountain, from lacquering with solvent-based lacquers laminating with solvent-based adhesives, flexography, screen-cleaning operation in screen printing, etc.	Damage to environment and human health	<ul style="list-style-type: none"> - Use of approved methods and techniques to prevent and control emissions - Selection of materials or processes with no or low demand for VOC-containing products, - Installation of baffle separators, where possible 	
Contribution to surface water pollution/ wastewater	Photo and plate processing activities		<ul style="list-style-type: none"> - To minimize the generation of wastewater:: - Use of water-developed films and water-developed plates; - <input type="checkbox"/> Use of countercurrent rather than parallel rinse processes to reduce the amount of clean water used; - disposal of residuals in designated hazardous waste landfills 	Wastewaters from the industrial process may contain metal compounds (e.g. silver and mercury), cleaning solutions may contain pigments, acids, and solvents (e.g. toluene). Acid plate-etching chemicals used in gravure may contain nitric acid, erchloroethylene, and butanol
Soil and underground water pollution / Wastes	Waste generation		-Reduction in the generation of hazardous and nonhazardous waste	

Table G-9. Printing				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
			Appropriate management of hazardous wastes: handling, disposal, neutralization	
Energy consumption	Printing process	Stress on natural resources	-Minimize energy consumption when optimizing waste gas treatment in all sites	BAT is to: -Seek opportunities to recover and use any surplus energy in all sites
Residual Impact Assuming Full Mitigation: LOW; Risk: MODERATE				

Table G-10. Sawmilling and manufactured wood products				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
The major environmental impact of sawmilling and wood products manufacturing concerns the management of forest resources	Utilization of forest resources	While not managed properly damage environment	In sawmilling and manufacturing of wood products, forestry impacts are minimized by maximizing wood conversion efficiency	
Solid waste generation	Solid waste generation is directly related to the conversion efficiency of roundwood to sawn lumber or other final products.		<ul style="list-style-type: none"> - Optimizing primary log breakdown technology and techniques; - To establish the optimum cutting pattern; -Use of relevant technology to maximize utilization of sawn boards; -Operator training and monitoring to ensure awareness and implementation of measures to improve conversion -Maximum waste recycling; - Use of wood and bark chips as mulch for gardens and 	<p>The use of modern equipment and trained staff may increase conversion efficiencies to 70 percent</p> <p>Conversion efficiencies from round wood to sawn lumber are often below 40 percent Opportunities for recycling of wood waste may exist through use of waste as inputs for secondary products in other industries or as a source of fuel for heat, etc.</p>

Table G-10. Sawmilling and manufactured wood products				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
			agriculture; - Use of sawdust and wood shavings for animal bedding; etc.	
Air pollution/ Air Emissions	Pre-treatment, coating, dryers (solvents, particulate matter, - odor, combustion gases, etc.)	Threat to human health and damage to environment	- To control air emissions associated with wood residue incineration and combustion in boilers; -Provide consistent fuel supply; -Where fly ash reinjection is used to improve furnace efficiency, -Use of filters and / or electrostatic precipitators, and / or scrubbers to control particulate matter; -Collection and distillation recovery of cleaning solvents; etc.	
Contribution to soil and water pollution/ wastewater	Storage tank leaks, pipework leaks, spent pre-treatment liquors, wash waters, etc.	Damage to environment	-Process wastewater containing chemical preservatives should be contained as part of a closed loop application system; -Containment of runoff from log yards through use of impervious surfaces; -Lining of log ponds to prevent contaminants leaching into the soil and groundwater	Toxic wood preservation chemicals may include polynuclear aromatic hydrocarbons, compounds of chrome, copper and arsenic. The runoff from log yards and log ponds may contain toxic chemicals leached from the timber, and soil and other materials washed out of the bark
Hazardous materials	Facilities involved in application of wood preservative treatments or the coating of products may store large volumes of hazardous chemicals such as		Measures, specific to wood preservative treatment facilities: -Storage tanks and components should meet relevant standards for design and operational performance;	Containing copper oxide and quaternary ammonium, Copper Azole and Borates may be used in dry situations, in addition to alternative building materials

Table G-10. Sawmilling and manufactured wood products				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
	wood preservatives, paints, lacquers, and solvents.		-Chemical storage and treatment sites and tanks should be situated in containment areas, etc.	
Residual Impact Assuming Full Mitigation: LOW; Risk: LOW				

Table G-11. Board and particle-based products manufacturing				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
The main issue is: sustainable forestry management and practices	Utilization of forest resources	While not managed properly damage environment	Use of more recycled or recovered fiber in board manufacturing	
Air pollution/ Air Emissions (particulate matter, dust, gases, chemicals, etc.)	Combustion process, utility boilers, hot gas generators, thermal fluid heaters, application of decorative coatings for boards, mechanical operations		<ul style="list-style-type: none"> - In utility plants, the general energy efficiency techniques should be adopted where appropriate; - Electricity use can be reduced - Energy used in drying can be reduced through use of relatively dry raw materials, including recycled wood matter in particle board manufacturing; - Provision of dust control equipment for areas identified with high potential for dust generation 	
Contribution to groundwater and surface water pollution/ Wastewater	Board and particle-based product mills	Damage to aquatic environment	<ul style="list-style-type: none"> - To prevent and control leaching; -Biological treatment for reduction of BOD; - Dewatering and disposal of residuals in designated waste landfills 	The quantity of effluent arising from manufacture should be minimized by the recycling techniques

Table G-11. Board and particle-based products manufacturing				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Hazardous Materials	The manufactured products may contain a variety of toxic compounds; including formaldehyde	Threat to human health, damage to environment Potential hazard if spills, and an occupational health and safety hazard if not handled appropriately	Appropriate hazardous materials handling and hazardous waste management, including its disposal and neutralization	
Solid Waste	Wood waste (e.g. board off cuts), waste from water treatment processes, and ash from combustion of wood waste		- Ash may be returned to the forest or to some other site for inclusion in the soil as a fertilizer and soil improver; following an evaluation of - Board off-cuts should be minimized, etc.	
Noise	Debarking drums and chipping machinery (the most noise), mechanical breakdown processes, sanding and cutting machinery	Threat to human health	- Debarking and chipping should be carried out in enclosed buildings; - Noise generating machinery should be regularly maintained; - Sound reducing earth banks or sound reflecting screens should be installed, as necessary	
Residual Impact Assuming Full Mitigation: LOW; Risk: LOW				

Table G-12. Pharmaceuticals and biotechnology manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Air pollution/ Air emissions (volatile organic compounds, acid gases, greenhouse gas and particulates)	Pharmaceuticals and biotechnology manufacturing facilities; milling, mixing, compounding, formulation, tableting, and packaging	Threat to human health, damage to environment	-Reducing or substituting the use of solvents and other materials which have a high VOC content, -Implementation of VOC leak prevention and control strategies from operating equipment;	

Table G-12. Pharmaceuticals and biotechnology manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
			-Reduction of equipment operating temperatures, where possible; -Installation of dedicated filtration systems to control particulate matter emissions	
Odor	Fermentation activities		Use of wet scrubbers to remove odors with a high affinity to water; -Condensation of vapors combined with scrubbers - Considering the location of new, taking into account proper distances to neighbors and the propagation of odors□	
Contribution to surface water pollution/ wastewater	Industrial wastewater may include: chemical reactions streams; product wash water; spent acid and caustic streams, etc. The main conventional pollutants of are BOD, COD, total suspended solids (TSS), ammonia, toxicity, bio degradability, and pH; other pollutants are organic and inorganic acids, ammonia, cyanide, toluene, and active pharmaceutical ingredients (API)		- Material substitution, where possible; -Condensation and separation processes to recover used solvents and aqueous ammonia	
Water Consumption		Stress on water resources	Reduce water consumption, especially where it may be a limited natural water resource	
Solid and Hazardous Wastes	Chemical synthesis processing generates wastes containing		-Waste reduction by material substitution;	

Table G-12. Pharmaceuticals and biotechnology manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
	spent solvents, reactants, spent acids, bases, aqueous or solvent liquors, still bottoms, cyanides and metal wastes. Fermentation: spent solids, intermediates, residual products		-Process modifications, is appropriate; -Potentially pathogenic waste from biotechnology manufacturing should be inactivated through sterilization or chemical treatment before final disposal	
Hazardous Management			To develop a Hazardous Materials Management Plan for which prior to: -Identify and implement management procedures including process safety, training, employee participation, etc. -Implement prevention measures including process hazard analysis, etc.	
Threats to Biodiversity	Collection of genetic resources (bio prospecting), which may be part of certain pharmaceutical or biotechnology projects		-Avoiding or minimizing harm to biodiversity in compliance with applicable legal requirements; -Development and application of bio prospecting procedures that are consistent with recognized standards	
Residual Impact Assuming Full Mitigation: MODERATE, Risk: HIGH				

Table G-13. Semiconductors and other electronics manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks

Table G-13. Semiconductors and other electronics manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Hazardous material and waste	Spent deionized water, solvents and developers, solutions, epoxy material, cyanide solutions, and soldering fluxes and metals residue	Damage to environment and threat to human health	-Implementing process or equipment modifications, where possible; -Raw material substitution or elimination; -Hazardous substance and waste segregation, separation, and preparation; -Substitute hazardous substances, where possible	Hazardous materials management in this sector include: - <input type="checkbox"/> Process chemicals storage areas should be regularly checked to identify leaks; - <input type="checkbox"/> Waste spill containment trays should be used -Metal-bearing sludge should be disposed in secure landfills
Air Emissions (Perfluorocarbon Compounds (PFC) and other greenhouse gases, toxic, reactive, and corrosive substances (acid fumes, dopant, cleaning gases, and volatile organic compounds [VOCs])	Diffusion, cleaning, wet-etching and other processes	Damage to environment and threat to human health	Most toxic gases can be controlled in special cabinets that are scrubbed or scrambled to atmosphere after careful monitoring of gas concentration to ensure that the gases are safely released with no impact on health and environment	
Energy Consumption	Thermal processes and wafers handling is highly mechanized, semiconductor manufacturing involves significant energy use	Stress on natural resources	- Air-handling equipment that controls humidity and temperature, - High-efficiency chillers, etc.	
Contribution to surface water pollution/ wastewater	Wastewater effluents may be impacted by organic and inorganic compounds, such as metals, acids and alkalis, cyanides and suspended solids	Damage to aquatic environment	To minimize both water use and potential discharge impacts	
Residual Impact Assuming Full Mitigation: MODERATE, Risk: HIGH				

Table G-14. Pulp and paper mills manufacturing
Overall Potential Impact: HIGH

Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Contribution to surface water pollution/ wastewater	The industry generate big volumes of wastewater contaminated by suspended solids, BOD, COD, dissolved organic compounds and other hazardous substances	Damage to aquatic environment	The most commonly used systems include a combination of i) activated sludge; ii) aerated lagoons; iii) biological filters of various types, often used in combination with other methods; iv) anaerobic treatment used as a pre-treatment stage, followed by an aerobic biological stage	End of pipe wastewater treatment technologies will depend on several factors including effluent composition, measurable effluent quality requirements, and discharge location (e.g. direct to water course or pre-treatment before discharge to municipal or other WWTP)
Air pollution/ Air Emission (malodorous and flue gases, CO ² , particulate matter, sulfur dioxide, nitrogen oxides and sometimes hydrogen sulfide)	Process gases, flue gases from incineration plants and from auxiliary steam and power generating units	Threat to human health and damage to aquatic environment	To execute strict primary and secondary control of air emissions	
Solid waste	Pulp and paper mills typically generate significant quantities of non-hazardous solid wastes but very little hazardous wastes		- Solid waste volumes should be reduced to the extent feasible through in- situ reuse and recycling of materials	
Energy Consumption	Pulp and paper mills are large energy and steam consumers	.Stress on natural resources	-Reducing heat losses and heat consumption - Increasing effectiveness of the secondary heating system concentration, as well as maintaining a tightly closed water system and a partially closed bleaching plant	
Noise	Mechanical equipment, transport vehicles, physical activities, and energy usage, notably vacuum pumps, liquid pumps and steam generation systems		Good practice techniques, e.g. closing bay doors, minimizing deliveries and adjusting delivery times, or if necessary, by specific engineered solutions	
Residual Impact Assuming Full Mitigation: MODERATE, Risk: HIGH				

Table G-15. Surface treatment of metals and plastics

Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Best Available Techniques	Remarks
Energy consumption	Processing	Stress on natural resources	To minimize electrical losses in the supply system as well as to reduce heat losses from heated processes To minimize water usage	
Raw material	Processing	Damage to environment	- To minimize material losses by retaining raw materials in process vats and at the same time minimize water - To use recycling and recovery, where possible	
Contribution to surface water pollution/ wastewater	Operational process	Damage to environment	- Chemical treatment of waste water, oil separation, sedimentation and/or filtration.	
Air pollution/ Air emissions	Operational process	Damage to environment	To prevent fugitive emissions from some processes by extraction and treatment.	
Noise	Operational process	Threat to human health/hearing loss (hypoxia)	Good practice techniques, e.g. closing bay doors, minimizing deliveries and adjusting delivery times, or if necessary, by specific engineered solutions	
Hazardous substances	Raw material	Damage to environment	To use less hazardous substances/ substitution of hazardous material, where possible	
Residual Impact Assuming Full Mitigation: LOW, Risk: LOW				

Table G-16. Metal, plastic and rubber products manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Metal products manufacturing				
Air pollution/ Air Emissions	Processing (sintering may	Damage to environment &	-Installation of refrigerator coils	

Table G-16. Metal, plastic and rubber products manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
(dust, metals, etc)	generate combustion by-products and greenhouse gases; inorganic and organic volatile compounds may be generated from oxides, dusts and lubricants used in the charges before compaction., handling of micro-sized metallic particles may generate metallic dust).	threat to human health	(or additional coils) above the degreaser vapor zone; -□ During welding and coating, metal surfaces should be carefully cleaned; -Installation of in-line aspirators with filters or scrubbers; -Where possible, maintaining wetness on the metal surface in order to prevent or minimize dust production	
Contribution to surface water pollution / wastewater and liquid wastes	Water-based cleaning and rinsing streams; cooling water; alternative cleaners; wastewater generated from cutting, blasting, deburring and mass finishing activities, etc.		Thermal pollution from discharge of non-contact cooling water should be avoided by use of recirculating cooling systems; - Use appropriate housekeeping techniques to prevent cutting oils from being contaminated with solvents; -Solvents should be carefully managed to prevent spills and fugitive emissions; - Use less hazardous degreasing agents; -Use mechanical cleaning techniques instead of chemicals where possible; -Avoid and substitute the use of chlorinated solvents with non-toxic or less toxic solvents as cleaning agents	Good process control and drag-out reduction are key factors for reducing the consumption of hazardous raw materials, and respectively, more clean effluents
Solid Waste	During thermal treatments oxide scales are formed. Metal forming produces a large quantity of metal chips (scrap		-If reuse or recycling is not possible, the waste should be treated as hazardous wastes and disposed and neutralized	

Table G-16. Metal, plastic and rubber products manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
	metal), etc.		appropriately	
Water consumption		Stress on water resources	The management of water consumption is crucial, as it also reduces the usage of raw materials and their loss to the environment.	
Plastics and rubber products manufacturing				
Plastics				
Air pollution/ Air Emissions (VOC, particulate matter)	Compounding and forming operations, especially when heated, during shaping, etc. Handling of dry additives and granulation of polymers (additionally, heating of thermoplastics during compounding and forming may result in formation and release of fine aerosols)		-Use of enclosed storage for all solvent and cleaning fluids, and for all low boiling point reagents; -Installation of ventilation control systems, especially at the-points of highest processing temperatures along the production line; -Installation of local exhaust extraction systems	
Contribution to surface water pollution/ Wastewater process and treatment	Wastewaters are formed by: cooling (or heating) water for plastics production, surface cleaning and wash water, and finishing operation water	Cooling (and heating) water may be a source of thermal pollution; toxic pollutants include phthalates. Cleaning water may be characterized by significant levels of BOD ₅ , COD, total suspended solids (TSS), total organic carbon, oil and grease, phenols, and zinc. Finishing water may contain significant levels of TSS and phthalates	-Adoption of good housekeeping practices; -For contact water and finishing water, installation of activated carbon process to remove soluble organics, -For cleaning and finishing water, recycling process water through sedimentation / settling units and removal of the suspended solids, oils and grease	
Rubber				
Air pollution/ Air Emissions (particulate matter, dust, VOC)	Rubber products processing (emissions of VOC and hazardous pollutants may be generated from used solvents)	Threat to human health & damage to environment	-Use of chemicals in small, pre-weighed, sealed bags to limit dust generation; -Emissions from the internal	

Table G-16. Metal, plastic and rubber products manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
			mixers should be controlled using bag filters; -Dust and fine rubber particles should be controlled; -Solvents should be minimized and carefully managed to prevent spills and fugitive emissions	
Contribution to surface water pollution/ Wastewater	Wastewater originates from many production processes: cooling, heating, vulcanizing, and cleaning operations. Suspended solids, and oil and grease are potential contaminants of concern, in addition to trace metals. Effluents may be also impacted by additives, solvents, oils, water-soluble and insoluble organic matter	Damage to aquatic environment	Solids settling, pH adjustment, or oil removal systems as needed. Wastewater should be trapped in a rubber trap, to let rubber float to the top for recycling / reuse. Wastewater should then be conveyed to treatment plant. Closed-loop water cooling or heating systems should also be considered	
Plastics & Rubbers				
Solid wastes	Scorched rubber from mixing, milling, calendaring, and extruding may be a solid waste source, in addition to waste rubber produced during rubber molding operations. Particulate matter is generated from bag filters in compounding areas, Banburys and grinders		-Waste streams should be properly segregated; -Uncured rubber, as well as slightly cured waste rubber, should be recycled; -Cured and off-specification rubber waste should be either recycled at the facility or reused; -Scrap from thermoplastic polymers should be reground and mixed with virgin materials; -If reuse or recycling is not possible, the waste rubber should be disposed properly	Significant quantities of solid waste are not typically generated in plastics and rubber manufacturing as scrap materials resulting from shaping and finishing operations can be recycled
Residual Impact Assuming Full Mitigation: MODERATE; Risk: MODERATE				

Table G-17. Foundries				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
Air pollution (dust & particulate matter, NO ₂ , SO ₂ , CO, VOC, greenhouse gases, etc.)	Dust and particulate matter are generated in each of the process steps with varying levels of mineral oxides, metals and metal oxides. Dust emissions arise from thermal, chemical/ physical processes and mechanical actions; NO ₂ emissions are caused by high furnace temperature and the oxidation of nitrogen; SO ₂ are emitted from waste gases in cupola and rotary furnaces; CO is generated from the oxidation of the graphite electrodes and the carbon from the metal bath during the melting and refining phases; emissions of VOCs, mainly consisting of solvents are primarily generated by the use of resins, organic solvents, or organic-based coatings in molding and core making	Threat to human health, damage to environment	<ul style="list-style-type: none"> - Implement routine plant maintenance and good housekeeping - Use indoor or covered stockpiles or, when open-air stockpiles are unavoidable, use water spray system, dust suppressants, windbreaks, and other stockpile management techniques; - Use dry dust collection technologies; - Install closed de dusting units in working areas. - Minimize the air / fuel ratio in the combustion process; - Use low NO_x burners in fuel firing furnaces, when possible; - Use fuel with low sulfur content, such as natural gas, - Improve thermal efficiency of the process; - Minimize binder and resin use through optimization of process control and material handling 	Recommended pollution prevention techniques: <ul style="list-style-type: none"> - <input type="checkbox"/> Use of induction furnaces, where possible; - <input type="checkbox"/> Use of open hearth furnaces is no longer considered good practice for steel smelting and should be avoided
Soil and water pollution from solid wastes generation and handling	These are: sand waste, slag from desulfurization and from melting, dust collected within emissions control systems, refractory waste, and scrubber liquors and sludge	Damage to environment	<ul style="list-style-type: none"> - Maximization of <i>sand</i> reuse within the facility; - External re-use of sand waste should be considered, Control of slag waste includes the following: - Slag production should be minimized through process optimization measures including: 	Slag Wastes often has a complex chemical composition and contains a variety of contaminants from the scrap metals. It may constitute about 25% of the solid waste stream from a foundry. Common slag components include metal

Table G-17. Foundries				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	Sources/ causes	Consequences	Prevention/ mitigation required	Remarks
			<ul style="list-style-type: none"> o Lower metal melting temperatures o Optimizing use of fluxes and refractory lining 	oxides, melted refractories, sand, and coke ash (if coke is used). Fluxes may also be added to help remove the slag from the furnace. Slag may be hazardous if it contains lead, cadmium, or chromium from steel or nonferrous metals melting
Contribution to surface water pollution through wastewater discharge	The most significant use of water in foundries is in the cooling systems of electric furnaces (induction or arc), cupola furnaces, and in wet de dusting systems		<ul style="list-style-type: none"> - Install closed loops for cooling water to reduce water consumption and discharge; - Recycle tumbling water by sedimentation or centrifuging followed by filtering; - Store scrap and other materials under cover and / or in bunded area to limit contamination of storm water and facilitate drainage collection 	
Noise	The foundry process generates noise from various sources, including scrap handling, furnace charging and EAF melting, fuel burners, shakeout and mould/ core shooting, and transportation and ventilation systems	Threat to human health/ hearing loss (hypoxia)	<ul style="list-style-type: none"> - Enclose the process buildings and/or insulate them; - Cover and enclose scrap storage and handling areas, - Enclose fans and insulate ventilation pipes; - Implement management controls, including limitation of scrap handling and transport during nighttime 	
Residual Impact Assuming Full Mitigation: LOW; Risk: MODERATE				

Annex H. Screening checklist to assess the social impacts and risks of sub-projects

Probable Social Impacts/Risks	Yes	No	Not Known	Details
1. Will the sub-project intervention include new physical construction work?				
2. Does the subproject intervention include upgrading or rehabilitation of existing physical facilities?				
3. Is the intervention likely to cause any permanent damage to or loss of housing, other assets, resource use?				
4. Does this subproject require private land acquisitions?				
5. Is there any physical displacement of persons due to activities/constructions?				
6. Does this project involve resettlement of any persons?				
7. Will there be loss of /damage to agricultural lands, standing crops, trees?				
8. Will there be loss of incomes and livelihoods?				
9. Will project cause loss of employments/jobs?				
10. Will subproject require labor force for new activities?				
11. Does proposed sub-projects have labor protection laws; ensure labor rights, operational safety, and health procedures?				
12. Does any activities under sub-project will use child labor/forced labor or refugees for production /services?				
13. Will the activities of SMEs /sub-projects have any issues/risks related to illegal employment?				
14. Does the subcontractor have temporary, seasonal employees? What is the form of contracting them? Does it intend to hire seasonal / temporary workers				
15. Are disadvantaged & vulnerable groups (including indigenous people, socially marginalized communities such as Roma, elderly, homeless, ethnic minorities will benefit by the subproject intervention?				
16. Will subproject activities provide services equally and fair without any discrimination against women, people with disabilities, elderly or socially vulnerable individuals and groups?				
17. Will activities of SMEs /sub-projects likely to have any issues/risk related to gender-based violence and sexual harassments?				
18. Are disadvantaged & vulnerable groups (including indigenous people, socially marginalized communities such as Roma, elderly, homeless, ethnic minorities will benefit by the subproject intervention?				
19. Has the local population or any NGOs expressed concern about the proposed activity's				
20. Does the subproject have measures to prevent the spread of COVID-19 in order to ensure Occupational Health and Safety of their workers?				
Overall Assessment of potential impacts and proposed mitigations measures, if any:				

Annex I(a). Pest Management Issues

Section I

Background information to be used during the screening process to be completed by sub-project beneficiary

PFI/MGF:

Sub-project beneficiary:

Sub-project title:

Sub-project description: (description of the nature of the investment: equipment purchases, civil works construction, purchase or use of agro-chemicals, seeds, equipment, etc.).

Description of sub-project location: (description of the general land use characteristics at or near the sub-project site; indication of the nearest population centers (villages, cities, etc.), proximity of any surface waters (lakes, rivers, etc.), any areas of particular human or environmental sensitivity or cultural interest (hospitals, schools, religious houses of worship, natural areas protected by the government or international agreements, etc.).

List of pesticides used by the sub-project beneficiary

#	Name of pesticides	Main use*	Active ingredient (AI) and/or formulated products		Class of hazard (WHO)	Area of application, crop	MAC** for usage (per area unit: l/ha, kg/ha etc.)	Actual usage rate	Producer	Certificate of state registration, date of registration, validity
			Common name (by ISO)	Content of AI (g/kg, g/l, g/ml)						
Pesticides used by the sub-project beneficiary										
1										
2										
3										
Pesticides proposed to finance under CEP-II AF funds (<i>see attached Info for beneficiaries</i>)										
1										
2										
3										

* Main use – herbicide, fumigant, fungicide, etc.

**MAC – Maximum Allowable Concentration (per area unit: l/ha, kg/ha etc.).

Environmental factors

➡ *The impact on the health of handlers, including those who store, sell, transport and apply pesticides:*

To give information regarding minimization of this factor's impact, namely:

- Do employees who handle pesticides as part of their normal work responsibilities receive any regular medical examination? If so, please describe.
- Is a logbook or other written record of pesticide application maintained? If so, what records are kept and who is responsible for this?
- Are pesticides used/planned for procurement under CEP-II AF funds permitted for usage within Moldova and eligible for financing under CEP-II AF?

➡ *The impact on the health of food consumers:*

To give information regarding minimization of this factor's impact, namely:

- Warning the food consumers about possible negative impact on their health caused by pesticides application and regarding their minimization (foods washing, etc.);
- Usage of pesticides which minimize the residue and are the least harmful for food consumers, etc.

➡ *Air and surface waters contamination:*

To give information regarding minimization of this factor impact, namely:

- Application of pesticides which are the least hazardous;
- Observance of rules of effective storage and application of pesticides;
- Planning activities and implementation of optimal volumes and time schedules of application of pesticides, etc.

➡ *Wastes*

To indicate the nature of wastes produced during the use of pesticides. To describe separately non-hazardous and hazardous wastes. To provide information on how each of these types of wastes will be handled (recycling, utilization, etc.).

For existing operations

To provide copies of all environmental permits, licenses, registration certificates, approvals, etc. To provide vendor's license to wholesale and retail trade of the pesticides (indicating the series, number, date of issue of the license and its period of validity).

Mentioned documents should be valid and contain expiration dates for these requirements.

Copies of documents that confirm operations aimed at minimization of negative environmental impact and its consequences, and copies of relevant documents (certificate of state registration, quality certificate, etc.) for storage, selling, transportation and applying of pesticides are to be provided.

To provide information regarding applying of the integrated pest management (IPM) methods or approaches:

- Does the beneficiary apply pesticides based on a predetermined schedule, or does the beneficiary monitor pest populations in the field in order to determine when pest numbers are high enough to justify pesticide application? If monitoring of populations is practiced, please describe monitoring methods and the thresholds (factors) which trigger pesticide application;
 - Does the beneficiary monitor numbers of beneficial species in the field (e.g. predatory insects, spiders). If so, which ones and how?
 - Does the beneficiary use any non-chemical methods to reduce pest populations and impacts? If so, please describe;
 - When applying pesticides, does the beneficiary take any specific precautions to reduce contamination of soil or water, or to reduce impacts on beneficial species? If so, please describe.
-

Attachment: Information for project beneficiaries

The Bank does not finance formulated products that fall in World Health Organization's (WHO) classes Ia and Ib, as well as Class II products whose toxicity level is equivalent to the WHO Ia/Ib categories, e.g. with oral LD50 for liquids = 200 mg/kg body weight or less (see table below).

Hazard Class	LD 50 for the rat (mg/kg body weight)			
	Oral		Dermal	
	Solids*	Liquids*	Solids*	Liquids*
Ia Extremely hazardous	5 or less	20 or less	10 or less	40 or less
Ib Highly hazardous	5 - 50	20 - 200	10 - 100	40 - 400
II Moderately hazardous	50- 500	200 - 2000	100 - 1000	400 - 4000
III Slightly hazardous	Over 500	Over 2000	Over 1000	Over 4000

* The terms "Solids" and "Liquids" refer to the physical state of the active ingredient being classified.

The Bank declines to finance pesticides which contain active ingredients from the WHO Ia/Ib classes regardless of how they are formulated, on the grounds that most of the commercially available formulations of these materials are quite hazardous and there are suitable alternatives for almost any application. However, if there is a clear technical case for doing so, and if the toxicity level of the formulated product is under the WHO 1a/1b cut-off point, the Bank could finance such a product.

The Bank will finance formulations of products containing active ingredients from Class II, but only if it can be ensured that they will only be handled by appropriately trained and equipped people and with appropriate safeguards for distribution, storage and disposal. So, they can be financed if the country has well-established and effective legal and regulatory systems addressing these points (e.g. through a certification/licensing program). If the country does not have adequate national control systems, the Bank would normally not finance these products. However, in special cases it could be done if clear and concrete measures are built into the project to ensure that the necessary restrictions will be met for access to/use of the particular materials to be procured). Exceptions can be made for specific formulations which are very low hazard because the active ingredient is at very low concentration, but the case should be made that there is no suitable alternative using an active ingredient which falls below Class II.

However, there are also a few products that **the Bank normally doesn't finance** even though they don't fall into WHO Classes Ia or Ib, because they have hazardous features which make them unacceptable despite having a moderate oral toxicity (oral LD-50, which is the main criterion for WHO classification). This could include human health hazards or environmental hazards. For example, the Bank doesn't finance the herbicide *Paraquat* which falls into WHO Class II (oral LD 50 is 150 mg/kg) but is very easily absorbed through the skin and has high toxicity through that route, and for which there is no known antidote. Another example is granulated slow-release formulations of some pesticides, which are low hazard to people but present a major threat to birds.

Section II

(to be completed by the PFI/MGF)

Please provide information:	If yes, please explain in details	Mitigation measures*
Does the beneficiary currently use or propose to purchase any pesticides which are not eligible for sub-project financing?		
Does the beneficiary appear to rely entirely or mainly on chemical control with no elements of IPM approach?		
Does the beneficiary have (or lack) adequate facilities to ensure safe storage of pesticides?		
Does the beneficiary have an adequate plan for disposing of excess pesticides and empty containers?		

Does the beneficiary have a record of environmental penalties, legal judgments, etc. related to its environmental performance, or any outstanding liabilities related to relevant activities aimed at minimization of environmental impact and its consequences?		
--	--	--

*For each question where the answer indicates an environmental or safety risk, a specific mitigation plan should be proposed.

Date

Signatures of empowered person on behalf of PFI/MGF and beneficiary

Annex I(b). Recommended Structure of a Pest Management Plan

1. **Background** which would outline:

- i) the *purpose* of the Plan,
- ii) indicate *pest management authorities*, and
- iii) pest management program *objective*.

2. **Responsibilities of individuals** (e.g., of Program Director, Health Chair, Pest Management Coordinator, Pest Management Personnel, etc.).

3. **General Information** which should provide data on land use and soil, in the area where the pesticides are applied; climate, geo-morphology, settlements in the area of concern, population, surface water, etc. as well as inventory of land use and layout of facilities.

4. **Priority of Pest Management** (e.g., undesirable vegetation, vertebrate pests, etc.)

5. **Integrated Pest Management**

5.1 *Principles of the Integrated Pest Management* are:

- a) *Mechanical and Physical Control*. This type of control alters the environment in which a pest lives, traps and removes pests where they are not wanted, or excludes pests. Examples of this type control include: harborage elimination through caulking or filling voids, screening, etc..
- b) *Cultural Control*. Strategies in this method involve manipulating environmental conditions to suppress or eliminate pests. For example, spreading manure from stables onto fields to dry prevents fly breeding. Elimination of food and water for pests through good sanitary practices may prevent pest populations from becoming established or from increasing beyond a certain size.
- c) *Biological Control*. In this control strategy, predators, parasites or disease organisms are used to control pest populations. Sterile flies may be released to lower reproductivity. Viruses and bacteria may be used which control growth or otherwise kill insects. Parasitic wasps may be introduced to kill eggs, larvae or other life stages. Biological control may be effective in and of it, but is often used in conjunction with other types of control.
- d) *Chemical Control*. Pesticides kill living organisms, whether they be plants or animals. At one time, chemicals were considered to be the most effective control available, but pest resistance rendered many pesticides ineffective. The trend is to use pesticides which have limited residual action. While this has reduced human exposure and lessened environmental impact, the cost of chemical control has risen due to requirements for more frequent application. Since personal protection and special handling and storage requirements are necessary with the use of chemicals, the overall cost of using chemicals as a sole means of control can be quite costly when compared with nonchemical control methods.

5.2 *Integrated Pest Management Outlines*.

This sub-chapter addresses each major pest or category of similar pests is addressed, by site, in separate outlines.

5.3 *Annual Workload for Surveillance, Prevention, and Control*.

In this sub-chapter has to indicate the number of man-hours expended for surveillance, prevention, and control of pests.

6. **Health and Safety**. This chapter should contain health and safety requirements as follows:

6.1 *Medical Surveillance of Pest Management Personnel*. All personnel who apply pesticides have to be included in a medical surveillance program.

6.2 *Hazard Communication*. Pest management personnel are given hazard communication training, to include hazardous materials in his workplace. Additional training is to be given to new employees or when new hazardous materials are introduced into the workplace.

6.3 *Personal Protective Equipment*. In this chapter has to be described approved masks, respirators, chemical resistant gloves and boots, and protective clothing (as specified by applicable laws, regulations and/or the pesticide label) are provided to pesticide applicators. These items are used as required during the mixing and application of pesticides. Pesticide-contaminated protective clothing is not be laundered at home but commercially. Severely contaminated clothing is not laundered, but is

considered a pesticide-related waste and disposed, as applicable for hazardous waste.

6.4 Fire Protection. The fire safety protection requirements has to be established; the pest management coordinator has to control implementation of measures to prevent fire

7. Environmental Considerations.

7.1 Protection of the Public. Precautions are taken during pesticide application to protect the public, on and off the installation. Pesticides should not be applied outdoors when the wind speed exceeds 155 m/min. Whenever pesticides are applied outdoors, care is taken to make sure that any spray drift is kept away from individuals, including the applicator. Pesticide application indoors is accomplished by individuals wearing the proper personal protective clothing and equipment. At no time are personnel permitted in a treatment area during pesticide application unless they have met the medical monitoring standards and are appropriately protected.

7.2 Sensitive Areas. No pesticides are applied directly to wetlands or water areas (lakes, rivers, etc.) unless use in such sites is specifically approved.

7.3 Endangered/Protected Species and Critical Habitats. Protected migratory birds which periodically occur on the installation cannot be controlled without a permit. The Pest Management Coordinator periodically evaluates ongoing pest control operations and evaluates all new pest control operations to ensure compliance with the list of endangered species. No pest management operations are conducted that are likely to have a negative impact on endangered or protected species or their habitats without prior approval from environmental authorities.

7.4 Environmental Documentation. An environmental assessment which specifically addresses the pesticide use program on the installation has been prepared. This plan is referenced in the assessment as documentation of pesticide use.

Annex J. Labor Management Procedure

The Republic of Moldova

Ministry of Economy and Infrastructure

SECOND COMPETITIVENESS ENHANCEMENT PROJECT

ADDITIONAL FINANCING

CEP-II AF Project

Labor Management Procedure (LMP)

April 2021

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Acronyms and abbreviations

CEP-II AF	Competitiveness Enhancement Project, Access to Finance
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESHS	Environmental, Social, Health and Safety
ESS	Environmental and Social Standard
PIU	Project Implementation Unit
GBV	Gender Based Violence
GRM	Grievance Redress Mechanism
GN	Guidance Note to ESS2
M&E	Monitoring & Evaluation
MoF	Ministry of Finance
LMP	labor-Management Procedures
NGO	Non-Governmental Organization
OHS	Occupational Health and Safety
ODIMM	Organization for the Development of Small and Medium Enterprises
PDO	Project Development Objective
PPE	Personal protective equipment
PAPs	Project affected peoples (persons)
SEP	Stakeholder Engagement Plan
SME	Small and Medium Enterprise
WB	World Bank

1. INTRODUCTION

Project Background

The Project was prepared under the World Bank Operational Policies (OP) and assigned environmental category of *Financial Intermediary* (“FI”). OPs 4.01 (Environmental Assessment) and 4.09 (Pest Management) were triggered. This category remains unchanged for the AF. As the AF activities will continue to have some environmental and social impacts, OP 4.01 continues to be relevant. OP 4.09 is also likely to remain relevant, as the AF could support agricultural activities that require the use of agricultural chemicals. No other safeguards policies are triggered for this AF.

The Moldova: Second Competitiveness Enhancement Project (CEP 2) Additional Finance (P175813), (Credit No. 5509-MD; Loan No. 8400-MD) and according to waiver of the Environmental and Social Framework, the Environmental and Social Directive for Investment Project Financing, and the Directive on Addressing Risks and Impacts on Disadvantaged or Vulnerable Individuals or Groups.

The memorandum seeks to approve a proposed continuation with the Second Competitiveness Enhancement Project Additional Finance (“AF”) of:

- the Environmental and Social Framework (the Vision for Sustainable Development, World Bank Environmental and Social Policy for Investment Project Financing and the Environmental and Social Standards);
- the Environmental and Social Directive for Investment Project Financing; and
- the Directive on Addressing Risks and Impacts on Disadvantaged or Vulnerable Individuals or Groups.

This additional financing is being prepared under the World Bank’s new Environment and Social Framework (ESF), which came into effect on October 1, 2018, replacing the Bank’s Environmental and Social Safeguard Policies. Under the ESF, all World Bank Borrowers have agreed to comply with ten Environmental and Social Standards (ESSs) applied to investment project lending financed by the Bank. The project recognizes the significance of, and adopts the ESSs, for identifying and assessing as well as managing the environmental and social risks and impacts associated with this investment project. One of the Standards – ESS2 relates to Labor and Working Conditions and expects the Borrowers to develop labor-management procedures (LMP). The LMP identifies the main labor requirements and risks associated with the project and help the Borrower to determine the resources necessary to address labor issues. The LMP is a living document, which is initiated early in project preparation stage and is reviewed and updated throughout the development and implementation of the project. The LMP identify key aspects of labor planning and management.

The LMP will enable different project-related parties, staff of the project implementing unit, Companies and sub-contractors and project workers, to have a clear understanding of what is required on a specific labor issue. Where relevant information is not available, this should be noted and the LMP should be updated as soon as possible. In preparing and updating this LMP, PIU refer to the requirements of national law and ESS2 and the Guidance Note to ESS2 (GN). The AF does not expect any labor influx issues. The AF will address labor risks by incorporating this labor management procedures in the revised and updated ESMF (as per

COVID-19 ESMF template adopted by the World Bank), including detailed risk mitigation measures in site-specific ESMPs at the sub-project level.

The document will include guidelines and procedures to assist workers and project staff in case of exposure to COVID-19 related health issues.

1.1 Project Objectives and labor management procedures

The PDO of the original project (“Project”) is “to increase the export competitiveness of Moldovan enterprises and decrease the regulatory burden they face.” The PDO would be achieved through a set of measures that aimed to: (i) improve the business environment through regulatory reforms that reduce the cost of doing business; (ii) help Small and Medium Sized Enterprises (SMEs) and exporters to get access to business development services; and (iii) improve access to medium and long term finance for export oriented enterprises.

Additional Financing. The PDO will remain unchanged under the AF, as the PDO and the core activities are critical for economic recovery in Moldova post the COVID-19 crisis.

The proposed AF in the amount of US\$33-35 million would support: (i) digitization of government to business services and reduction of compliance costs for enterprises in the country; and (ii) SME development and export competitiveness through export linkages and export promotion to re-launch exports and help local firms integrate in export value chains and enhancement of export operations; (iii) access to longer-term finance to help local SMEs. These three activities will be designed to directly respond to the challenges faced by SMEs during the pandemic and its aftermath and will contribute significantly to the scale and speed of economic recovery for firms, workers and the households that depend on this income.

Digitization and export linkages/competitiveness are important for COVID-19 recovery for enterprises in a landlocked country like Moldova.

The proposed AF will also support the financing needs of private SMEs, during and post the COVID-19 crisis.

There is an urgent need for assistance in response to the COVID-19 pandemic and support to enterprises in Moldova. The Government has provided limited emergency support to firms during the lockdown, mostly for preserving jobs, delaying tax payments and compensating the cost of emergency liquidity borrowing. However, the Government’s fiscal situation has deteriorated due to lower revenues caused by COVID-19 effects. Due to the limited budget space, restrictions of firm activity and movement of people have been mostly removed, to allow the economy to begin to recover. However, direct firm support is needed, and the country has limited internal resources to offer to firms in terms of investment or working capital financing, especially as banking system resources have been increasingly absorbed by government borrowing on internal market to cover fiscal challenges or limited by higher risks of lending. The AF will support the government’s efforts to respond to the challenges of the COVID-19 pandemic through existing instruments. Real GDP in Moldova is expected to fall by 7.2 percent in 2020. Employment is expected to drop by 8 percent in formal sector in 2020. According to Enterprise Survey COVID-19 impact on Moldovan SMEs, 10 percent of SMEs permanently closed as result of COVID-19. Seventy-five percent of SMEs reported monthly reduction in sales as compared to one year ago. 36 percent of SMEs report reducing workforce as compared to pre-COVID.

The purpose of the LMP, outlined in the World Bank's ESS2, will help the Project to facilitate planning for the project and will help to identify the resources necessary to address the labor issues associated with the project. The labor management procedures will help to identify the different types of project workers that are likely to be involved in the project, and set out the ways of meeting the requirements of ESS2 that apply to the different types of workers. The LMP will set out a systematic approach to the management of labor issues in the project and reflect the requirements of national law and requirements of ESS2

The LMP will:

- Review of national Laws and Policies related to labor environment in the Republic of Moldova;
- Promote fair and equitable labor practices for fair treatment, non-discrimination and equal opportunity of workers;
- Protect workers' rights and promote healthy, safe and secure work conditions;
- Ensure the management and control of activities that may pose labor-related risks at workplaces.

1.2 About the Project

The proposed CEP II AF is fully aligned with the Project and will support the PDO. Activities to be supported under the AF are for scaling up, re-designed to fit the COVID-19 pandemic crisis, and will build efficiently on the Project's activities:

- *Digitization and reduction of regulatory burden for enterprises through:*
 - Digitize inspections, ensuring risk-based inspections are implemented and sustained to enable less burden to business and promoting touchless interactions in line with COVID-19 precautions.
 - Digitize business registration, enabling online service delivery. This will enable further digitization of businesses, reduction of their compliance costs, and easier entry to the market. This will create more business activity in the country, thus leading to more employment generation; scale up digitization of government to business services, including local level ones, and ensuring they are digitized and placed on the central Government portal (OSS for permissive documents).
 - Continue with competition reforms and enabling level playing field for private sector, making recovery for vulnerable but viable SMEs easier.
- *Export competitiveness through:*
 - Continue export promotion and export readiness work through focused technical assistance and capacity enhancement activities to help exporting SMEs, which may face new COVID-19 requirements to export their products.
 - Continue enabling local firms to export through matching grants.
 - Enable local linkages, where local firms will be connected with FDIs or exporting companies to enable value chain integration. This is a critical tool for COVID recovery since Moldova is landlocked with limited local market potential. Exporting local products will enable SMEs to grow, generate revenues and maintain and even create employment that would not be possible without exports. Thus, the outcome of this work will be measured in terms of export sales and employment.
- *Access to Finance through support to private SMEs with medium to long term finance through credit guarantees.*
 - Contribute to the capitalization of the existing CGF managed by ODIMM, to expand its capacity to facilitate access to funding for SMEs, including export-oriented

enterprises and COVID-affected SMEs. Partial credit guarantees will help mitigate financing risks and deploy liquidity from local banks, helping to address the financial institutions' increased perception of risk in lending to SMEs, due to COVID-19 effects.

The Project Management component covered costs related to management of Components 1 and Component 2 of the Project, as well as activities that overlap with Component 3 (e.g. accountant, procurement specialist, etc.). The PIU is monitoring performance of all stakeholders under the Project, including the CGF managed by ODIMM.

Additional Financing

The PDO will remain unchanged under the AF, as the PDO and the core activities are critical for economic recovery in Moldova post the COVID-19 crisis. The economic costs and continued vulnerability remain large, and the financing needs for economic recovery in Moldova are high. In its letter dated November 25, 2020, the Ministry of Finance of Moldova has requested additional financing under the Project to improve business environment, export competitiveness and access to finance as a post crisis short- and medium-term response to alleviate the negative impacts of COVID-19. The Government's coordinated economic policy and investment response for the post-COVID recovery strategy for a number of sectors of the national economy³ focuses on linkages with international markets and has been the key recommendation.

The proposed AF in the amount of US\$33-35 million would support: (i) digitization of government to business services and reduction of compliance costs for enterprises in the country; and (ii) SME development and export competitiveness through export linkages and export promotion to re-launch exports and help local firms integrate in export value chains and enhancement of export operations; (iii) access to longer-term finance to help local SMEs. These three activities will be designed to directly respond to the challenges faced by SMEs during the pandemic and its aftermath and will contribute significantly to the scale and speed of economic recovery for firms, workers and the households that depend on this income.

Digitization and export linkages/competitiveness are important for COVID-19 recovery for enterprises in a landlocked country like Moldova. There is a direct impact of growth slowdown in EU and Russia and a decline in demand for FDI-firms' goods in Moldova, in particular car supply chain firms from Germany, Italy, Romania, and Austria, as well as for agricultural exports – both of which are key for the Moldovan land-locked economy. Disruption of the supply chain for manufacturing, textile, agriculture, and supply of pharmaceuticals is also evidenced. The export to EU is over 68 percent of total (goods exports to GDP ratio is low, 17 percent of GDP). FDIs in Free Economic Zones in Moldova accounted for half of all FDI inflows pre-crisis and net FDIs accounted for 4.6 percent of GDP in 2019. For a small landlocked country, enabling export linkages and increasing export competitiveness is critical to spur growth in post COVID-19 recovery. It is likely that some importing countries will require additional COVID-related processing, packaging and transportation requirements before Moldovan goods can be accepted in the future. This would increase costs to the firms so a more supportive set of business and investment climate tools and policies would be especially important to enable a smooth re-entry into those markets.

The proposed AF will also support the financing needs of private SMEs, during and post the COVID-19 crisis. Firms, especially SMEs, are confronted by plunging incomes and disruptions in supply chains. This translates into a liquidity crunch, which raises demand for

³ COVID Matrix. Economic Council under the Prime Minister of Moldova, 2020

additional financing, particularly working capital loans. The Enterprise survey follow-up surveys conducted in November 2020 found that 87.8 percent of Moldovan firms experienced decreased liquidity or cash flow availability while 34.5 percent had been overdue on obligations to financial institutions for reasons directly related to the pandemic and trade disruptions. At the same time, banks are likely to tighten lending standards or refrain from extending new loans to riskier market segments such as private SMEs (particularly young firms) thus amplifying procyclical negative behavior. Access to credit and working capital for viable enterprises who have become cash-strapped due to exogenous pandemic-related causes is critical to preserve the private enterprise sector, avoid a wave of defaults, and provide the needed financing support during the recovery phase. As evidenced by studies on the impact of crises on SMEs, facilitating capital is of particular importance as SMEs often experience a depletion of working capital and lack of available financing, which contributes to increased insolvencies. Furthermore, reduced use of long-term finance can result in a decline of profitable fixed investment and lower productivity growth.⁴

2. OVERVIEW OF LABOR USE ON THE PROJECT

2.1 Characteristics of Project Workers:

The project activities sort four types of employment categories, these include:

- i. *Direct workers* such as PIU staff who will be directly engaged in the project activities throughout the project life.
- ii. *Contracted workers* through third parties such as Companies (SMEs), construction workers and consultancy firms for technical assistance in project management. Roles and responsibilities of some of workers in this category maybe corresponding to direct worker.
- iii. *Primary supply workers* – people engaged by the borrower or Companies and consultancy’s primary suppliers.
- iv. *Community Workers* - short-term contracts.

Migrant international workers are not expected to be employed. This information results from the experience of main project implemented in the last years. Some local migrants coming seasonal from abroad may be hired locally by beneficiary companies.

Community workers and primary supply workers will not be involved directly in the project. They can be hired by the SMEs.

Thus, it is expected that project will engage the following categories of project workers as defined by ESS2:

Direct workers: In this category are included beneficiary entity- Project Implementation Unit (PIU) and Agencies working directly with them.

To facilitate the project implementation, the Beneficiary will create a Group for coordination of the CEP-II AF Project implementation, consisting of delegated specialists from both Ministries and other institutions with a role of monitoring the Project implementation.

⁴ OECD. “The Impact of the Global Crisis on SME and Entrepreneurship Financing and Policy Responses.” 2009.

Contracted Workers: The staff of selected PFIs and the sub-contracted workforce will be considered as contracted workers.

2.2 Number of Project Workers:

Direct Workers. The estimated number of direct workers from PIU team would be 10 staff members.

Additionally, at least total number of (to be specified when available) short-term consultants will be hired to support the implementation, coordination, supervision and reporting on vary activities of the project.

Contracted Workers. The exact number of sub-project contracted workers, to be employed, is not defined at this stage. Based on national experience, all workers will be over 18 years old. The unskilled laborers may be expected to be involved in the sub- project works. The local population may be hired temporary as the skilled or unskilled laborers in their regions.

2.3 Timing of Labor Requirements:

The ESS2 applies to project workers including full-time, part-time, temporary, seasonal and migrant workers.

In addition to the basic tasks and assignments within the MoF, MEI, the activities related to the implementation of the project will be part of the work program that these employees have within the Ministries.

The direct workers (PIU staff) are hired on a full-time basis for the entire project period. Other experts/consultants will be hired on demand basis throughout the project implementation period. The time input of contracted workers will be defined at a later stage, however, it is clear that they will be engaged depending on the implementation of various project components and sub-components on specific time slots.

The labor timing and sequencing of the contracted workers is under determination. This section can be filled once the sequencing of labor of the contracted workers, the implementation and procurement plans are finalized.

Agriculture & Construction season typically lasts from March-April to October-November but can be somewhat longer or shorter depending on weather conditions. The Companies has limited staff that can work on some works even during winter period.

The work hours should not exceed 8 hours a day, with the provision of at least 1 hour for the rest.

2.4 Contracted Workers:

Due to the Project objectives, it is expected that support will be given to well-known reputable predominantly national SMEs who have already established their operation in

Moldova or obey by and operate under the Moldova regulatory framework including Labor and Occupational Health and Safety (OHS) laws. Each company shall be bound by these LMP.

3. ASSESSMENT OF KEY POTENTIAL LABOR RISKS

3.1 Project activities

Given the economic concentration (manufacturing 23 percent of GDP, agriculture 10 percent, and services 54 percent,) exports are more diversified. The matching grants and access to finance to be supported under the Project will be implemented countrywide, based on demand for proposed activities that meet existing Project requirements and can demonstrate vulnerability to COVID-19 conditions.

The main business supported by Project are linked with Agriculture, Construction and Processing:

E-1	Mammalian livestock production*	G-2	Construction material extraction*
E-2	Poultry production*	G-3	Cement and lime manufacturing*
E-3	Annual crop production & plantation crop production*	G-4	Ceramics manufacturing*
E-4	Aquaculture*	G-5	Glass manufacturing*
E-5	Seeds	G-6	Textile manufacturing*
E-6	Pedigree seeds	G-7	Tanning and leather finishing*
E-7	Fertilizers application	G-8	Soap and detergent manufacturing
E-8	Pesticides application	G-9	Printing*
E-9	Agricultural machinery (tractors, winnowers, sowing machines, etc.)	G-10	Sawmilling and manufactured wood products*
E-10	Vehicles	G-11	Board and particle-based products manufacturing*
E-11	Buildings for crop stock, machinery and other agricultural needs	G-12	Pharmaceuticals and biotechnology manufacturing*
E-12	Land preparation	G-13	Semiconductors and other electronics manufacturing*
E-13	Fuel & Lubricants' Storage and Handling	G-14	Pulp and paper mills manufacturing*
E-14	Fencing	G-15	Surface treatment of metals and plastics*
E-15	Veterinary service	G-16	Metal, plastic and rubber products manufacturing*
F-1	Poultry & meat processing*	G-17	Foundries*
F-2	Slaughter-houses		
F-3	Poultry & meat packing		
F-4	Dairy*		
F-5	Vegetable oil processing*		
F-6	Sugar manufacturing*		
F-7	Food and beverage processing*		
F-8	Breweries*		
F-9	Vegetable processing and canning*		
F-10	Frozen food production		
F-11	Flour milling		
F-12	Warehousing		
F-13	Markets		
G-1	Construction activities		

**Resource: ESMF: Annex E-G. Environmental, Health, and Safety Guidelines. World Bank Group, 2007.
<http://www.ifc.org/ifcext/sustainability.nsf/Content/EnvironmentalGuidelines>*

3.2 Key Labor Risks:

Labor risks for *Contracted workers* includes tripping and falling, accidents during works, exposure to hazard materials, exposure to noise and dust, exposure to risk to electrical hazards from the use of tools and machinery, risk from operating heavy machinery. Taking in consideration the presence of possible hazardous work, persons under the age of 18 will not be employed by the Project.

Many construction sites will have a mix of workers, e.g. workers from the local communities; workers from a different part of the country; workers from another country. Workers will be employed under different terms and conditions and be accommodated in different ways. Assessing these different aspects of the workforce will help in identifying appropriate mitigation measures:

- The Contractor should prepare a detailed profile of the project work force, key work activities, schedule for carrying out such activities, different durations of contract and rotations (e.g. 4 weeks on, 4 weeks off).
- This should include a breakdown of workers who reside at home (i.e. workers from the community), workers who lodge within the local community and workers in on-site accommodation. Where possible, it should also identify workers that may be more at risk from COVID-19, those with underlying health issues or who may be otherwise at risk.
- Consideration should be given to ways in which to minimize movement in and out of site. This could include lengthening the term of existing contracts, to avoid workers returning home to affected areas, or returning to site from affected areas.
- Workers accommodated on site should be required to minimize contact with people near the site, and in certain cases be prohibited from leaving the site for the duration of their contract, so that contact with local communities is avoided.
- Consideration should be given to requiring workers lodging in the local community to move to site accommodation (subject to availability) where they would be subject to the same restrictions.
- Workers from local communities, who return home daily, weekly or monthly, will be more difficult to manage. They should be subject to health checks at entry to the site (as set out above) and at some point, circumstances may make it necessary to require them to either use accommodation on site or not to come to work.

The Employers may encourage the workers to be vaccinated with the available covid-19 vaccine, when the doses are available for that category of participants even if it is not mandatory.

The main labour risks associated with the project are assessed to be related to the potentially hazardous work environment, the associated risk of accidents for workers engaged on the project and the community and labour influx.

Many workers will be exposed to occupational health and safety hazards, primarily including, but not limited to:

- Lack of awareness on occupational health and safety requirements such as the use of personal protective equipment (PPE) and safe workplace practices;
- Electrical works;

- Exposure to chemicals (as paints, solvents, lubricants, and fuels);
- Traffic accidents;
- Excavations hazards;
- Lifting of heavy structures;
- Exposure to construction airborne agents (dust, silica and asbestos);
- Welding hazards (fumes, burns and radiation).

No other labor risks are considered to be significant. The project is assessed as “Low” on gender-based violence (GBV) risk. However, the ESMPs for of the project components will be developed and will include GBV risks assessment and mitigation measures to prevent and respond to GBV risks.

Therefore, the GBV aspect in project implementation will focus socially vulnerable groups protection and on prevention of GBV (physical violence - such as slapping, kicking, hitting, or the use of weapons; emotional abuse - such as systematic humiliation, controlling behavior, degrading treatment, insults, and threats; sexual violence etc.) between the project workers, between the project workers and the community.

The PIU will ensure that GBV risks are adequately prevented and mitigated. The prevention measures will include, but will not limited to: Code of Conduct for all employees, GBV-sensitized grievance mechanism, awareness raising of all employees and community members on GBV risks and mitigation measures.

However, if other labor risks arise during project implementation, the implementing entities will develop relevant procedures to prevent potential impacts.

Based on current conditions in the sector it is assessed that the risk of child or forced labour is negligible, and already managed through national legislation and WB requirement. However, child labour will be mitigated through certification of labours’ age. This will be done using national identification documents, passports, birth certificates. The Companies will report periodical the lists and number of staff.

There are three mains categories of risk:

- **Community health and safety.** The risk is associated with the potential for unprotected worksites, management of traffic and labour management. While a substantial number of jobs will be created, it is not expected that the Project area will experience substantial labour influx as most of the skills required by Companies can be sourced locally in Moldova. If will be the case, external workers, expat and national, will be accommodated at existing housing in the area, houses that are normally rented out for such purposes, which has been prior practice by Construction companies in similar projects. There will be no encouraged dedicated camps established for worker accommodation in the project. Specific requirements to manage risks associated with labour influx, related to interaction between project workers and local communities, such as communicable diseases and gender-based violence, are managed through contractual requirements, code of conduct and training set out in Project documents. These procedures are guided by national legislation and ESS2 and ESS4. These requirements will be dealt with through the PIU and workers codes of conduct for contractor staff.
- **Occupational health and safety.** The risk may be accidents of falling into ditches or heights, as there will be reservoir construction that will be more than 5m high, collapsing

of deep excavations like deep trenching, etc. The risks assessment will be developed for each subproject and be updated during the implementation of the project. Mitigation measures will be placed for all identified risks in the OHS Plan. Specific requirements to manage health risks associated with interaction of project workers and local communities, such as communicable diseases and gender-based violence, are managed through contractual requirements, code of conduct, awareness raising, and training set out in this document. These procedures are guided by national legislation and ESS2 and ESS4.

- Labour influx.** Companies activities will result in job creation but it is not expected that the Moldova and subprojects areas will experience any substantial labour influx. Thus, PIU will minimize the risk of labour influx by requesting Companies to prioritise recruitment of unskilled local labour in the project areas consequently, no labour camps will be established. However, the project Companies will recruit the external workers with specialized skills, who will be accommodated in local hotels or houses. This has been a practice by other Companies in previous and similar international projects (water, energy, sanitation, roads). Labor risks including labor influx and associated Gender-Based Violence (GBV), and child labor are considered low given the small size of subproject construction works and the adherence to the national labor code which prohibits forced labor (article 10, Labor Code). Since civil works to be supported under the project will be very small in scale and prioritized by Project and together with local communities themselves, the risk of forced labor is expected to be small. Nonetheless, the contractor will be required in the contract to commit against the use of child and forced labor, introduce mitigation measures against GBV, and Project staff in charge of contractor supervision will monitor and report the absence of forced labor.

In the event an employee is injured at work, the incident will be handled according to the applicable laws including the Labour Code (inform Police and Labour Inspection, create a Company group of inspection etc.). All Companies will be required to have a written contract with their workers materially consistent with objective of ESS2 and in compliance of this LMP, in particular about child and forced labor, following the requirement in the Bank's Standard Procurement Document (SPD). A major accident/incident has to be reported to PIU by the Company and to ESIT to the WB.

It is expected that the Labor risks associated with the direct workers will be low, given the fact that project implementing entities have high awareness of national labor legislation and the provisions of the national Labor Code. Moreover, the type of work to be carried out by the direct workers does not entail high vulnerability to abuse of labor rights or OHS risks.

COVID-19 considerations. COVID-19 specific risks will relate to the activities being carried out by the workers, in the context in which the project is being conducted. The identification of the risks will assist designing appropriate mitigation measures to address those risks, including: i) conducting pre-employment health checks; ii) controlling entry and exit from site/workplace; iii) reviewing accommodation arrangements, to see if they are adequate and designed to reduce contact with the community; iv) reviewing contract durations, to reduce the frequency of workers entering/exiting the site; v) rearranging work tasks or reducing numbers on the worksite to allow social/physical distancing, or rotating workers through a 24-hour schedule; vi) providing appropriate forms of personal protective equipment (PPE); vii) putting in place alternatives to direct contact, like tele-medicine appointments and live stream of instructions. The Project

documents will include guidelines and procedures to assist workers and project staff in case of exposure to COVID-19 related health issues.

4. BRIEF OVERVIEW OF LABOR LEGISLATION: TERMS AND CONDITIONS

This section sets out the key aspects of national labor legislation, regarding the working terms and conditions.

The overview focuses on legislation, which relates to the items set out in ESS2, paragraph 11 (i.e. wages, deductions and benefits). The Labor Code of the Republic of Moldova will be applied in relation to all project workers.

A brief overview of the legislation in terms of wages, deductions and benefits is summarized below:

Salary wages and deductions

The amount and form of remuneration in Moldova is determined by the individual labor contract. The wage is paid at least monthly.

The amount of the average monthly salary per economy, forecasted for 2021, will be 8716 lei (~US\$ 500). A decision in this regard was approved, at the end of December 2020, by the Cabinet of Ministers. This amount is used to determine the ceiling for the calculation of social security benefits and the monthly insured income of employees.

The average monthly salary per economy was calculated in accordance with the forecast of macroeconomic indicators for the years 2021-2023, estimated by the Ministry of Economy and Infrastructure.

In 2020 the average salary in the economy was 7953 lei (US\$ 450). At the same time, the minimum guaranteed amount of salary in the real sector was increased from 2775 lei (US\$ 160) to 2935 lei (~US\$ 170) per month. The government is re-examining the guaranteed minimum wage in the real sector on the basis of the annual summary increase in the consumer price index and the rate of increase in labor productivity at national level.

The employers usually deduct the income tax and the health and social insurance contributions automatically from the wages, and transfer them to the fiscal authorities. The total amount of deductions cannot exceed 50 percent from the wage to be paid to the employee.

Working Hours

The Moldovan Labor Code envisages a regular 40-hours work week (Art. 95 of the Moldovan Labor Code). The work is set at up to 25 hours per week for individuals aged up to 16 and 35 hours per week for those aged 16-18, as well as for individual working in hazardous sectors of the economy. The daily duration of the working time for the individuals with severe disabilities is established according to the medical certificate, within the limits of the normal daily working time (art. 100). However, this category of individuals is entitled to benefit of a working time reduced up to 30-hours per week (Art. 96).

Rest Breaks

Employees are entitled to a lunch break of at least half an hour each workday. The exact duration of the lunch break rest is stipulated in the collective labor agreement or the internal regulations of the entity. Meal breaks, with the exceptions specified in the collective labor contract or entity internal regulations, shall not be included in the working time. The duration of the daily break, that is the time between the end of the working program and the start of the work program the following workday cannot be less than the double duration of the daily working time (Article 107). Weekly rest is granted for 2 consecutive days, usually Saturday and Sunday.

Leaves (annual, played, unpaid)

The right to annual leave is guaranteed to all employees. Any employee who works based on an individual labor contract shall benefit from the right for annual rest leave which can be used after the first six months of employment. All the employees are entitled to be paid annual rest leave, with duration of minimum 28 calendar days. The leave does not include a period of temporary disability, and maternity leave. In addition, employees may request up to 120 calendar days of unpaid leave with a justification and agreement from the employer. Short-term and seasonal contracts are not clearly covered in the Moldovan Labor Code and practically, those employees do not benefit from annual leaves.

Overtime Work

An employer can order overtime work in case that is related to national defense or emergencies. Normally, at employer's request, employees can perform overtime work up to 120 hours during the calendar year. In exceptional cases, this limit can be extended to 240 hours with the agreement of both parties (Article 104). Employers must keep a record of the work performed outside the normal working hours. The overtime work is paid at 1.5 the amount of the regular hourly rate for the first two hours of overtime work and at 2 times the regular rate for the subsequent hours.

Labor Disputes

The Labor Code of Moldova includes provisions that allow workers to resolve individual and collective disputes between the employer and the employee(s) over the terms and conditions of a labor agreement or other aspects of work, including occupational and labor safety (Articles 288, 357-361). The disagreements and disputes may be solved through conciliation. A conciliation commission should be set not later than three days from the registration of the labor dispute and conflict. The commission should notify the parties in writing within five days from reaching an agreement on how to settle the dispute. If the parties do not agree with the recommendations of this commission, the conflict shall be settled in court.

5. BRIEF OVERVIEW OF LABOR LEGISLATION: OCCUPATIONAL HEALTH AND SAFETY

The Moldovan Labor Code as well as the Law on Occupational Health and Safety (OHS) (2008) set the framework for occupational health and safety in Moldova. Several Government orders and decisions detail how these are to be implemented and outline the list of hazardous industries and occupations in the country. Overall, the Moldovan OHS legislation is extensive, and generally, in line with the provisions set out in ESS2, paragraphs 24 to 30, the main challenge being the implementation and enforcement of these provisions.

Employers' Obligations

Article 198 of the Labor Code envisages that each business entity or organization should have internal regulations that outline, among other things, the occupational health and safety provisions of the organization. Articles 9 and 10 of the Law on OHS makes the employers responsible for ensuring the health and safety of the employees, for identifying and preventing

work-related risks, for informing and training staff on the risks and organizational OHS provisions. The employer must provide the necessary means and equipment and adapt the working environment to prevent and minimize the occupational risks. Article 11 mandates the employer to assign at least one trained individual within the organization responsible to ensure the compliance with the OHS provisions. The employer may set a collective OHS committee made up of both employee and employer's representatives to supervise the OHS arrangements in the work place. In case of emergencies, the employer must take immediate action to provide emergency response and evacuation of workers from the premises/site (Article 12 of the OHS law)⁵.

As COVID-19 spreads primarily through respiratory droplets or contact with contaminated surfaces, Contractors conducting the refurbishment works will undertake additional measures. It is known that exposure can occur at the workplace, while travelling to work, during work-related travel to an area with local community transmission, as well as on the way to and from the workplace.

Contractors should have the support of an occupational health and safety advisor and carry out rapid risk assessments to determine the possibility of exposure risk in order to put in place preventive measures.

Thermal screening at the workplace can be considered part of a package of measures to prevent and control COVID-19 at the workplace. Workers should be encouraged to self-monitor their health and take their own temperature regularly at home. Workplaces should adopt "stay at home if unwell" and flexible sick leave policies to discourage workers with symptoms consistent with COVID-19 from coming to the workplaces.

The policy on wearing a mask is relevant for workers both for the prevention of the contagion and for protection from very fine aerosols or respirable dusts, which may be released by grinding, drilling, milling, as well as painting and cleaning processes required for the refurbishment of the ICUs.

The Contractor(s) are obliged to ensure the following:

- 1) Assigning or employing a person responsible for the adaption and implementation of the OHS plan and adapting workplaces and procedures to minimize physical contact and ensuring required distance between workers, thus avoiding the spread of the contagion;
- 2) Provision of medical insurance covering treatment for COVID-19, sick pay for workers who either contract the virus or are required to self-isolate/quarantine due to close contact with infected workers and payment in the event of death;
- 3) Set specific procedures relating to the workplace and the conduct of the work (e.g. creating at least 1-2 meters between workers, limiting the number of workers present);
- 4) Set specific procedures and measures dealing with specific risks, such as infection prevention and control strategies, health workers' exposure risk assessment and management, developing an emergency response plan as per WHO Guidelines;
- 5) Appointing a COVID-19 focal point with responsibility for monitoring and reporting on COVID-19 issues, and liaising with other relevant parties;
- 6) Implement training on the latest WHO advice and recommendations on the COVID-19 infection prevention;
- 7) Raise awareness and ensure that all workers participate in trainings in mitigating the spread of COVID-19;
- 8) Including contractual provisions and procedures for managing and monitoring the performance of contractors, in light of changes in circumstances prompted by COVID-19; and

⁵ <https://mepiu.md/>

9) Monitor, supervise, and report on health and safety issues relating to COVID-19.

Other occupational health and safety measures include:

- Maintaining records of recruitment and employment process of contracted workers;
- Communicating clearly job description and employment conditions to contracted workers;
- Having a system for regular review and reporting of labor, and occupational safety and health performance on site;
- Delivering regular orientation and OHS training to employees;
- Provide workers with relevant PPE equipment due to WHO recommendations and WB EHS Guidelines for Healthcare Facilities;
- Establish and implement a procedure for documenting specific incidents such as project-related occupational injuries, illnesses, and lost time accidents. Maintain such records;
- In instances of medium, severe, fatal accidents, inform the law enforcement bodies and Labor Inspectorate; and
- Developing and implementing a grievance registration mechanism that would record and address the grievances raised by the workers.

The Employers may encourage the workers to be vaccinated with the available covid-19 vaccine, when the doses are available for that category of participants even if it is not mandatory.

Employees' Rights and Obligations

Employees have the right and obligation to inform the employer of any emerging hazard or malfunctioning equipment as well as make suggestions on how to improve the OHS rules at the workplace. Employees have the right to refuse to work if the working place does not meet the OHS requirements. They are entitled to be informed and trained about the occupational risks and be provided the required protective gear by the employer at the employer's expense.

6. RESPONSIBLE STAFF

Project Implementation Unit

This PIU oversees implementation of the entire CEP-II AF project. The PIU under MEI administers the MGF and has a fiduciary role. It is responsible for handling financial management, procurement, and monitoring and evaluation aspects. MGF team works under the supervision of the Executive Director of the CEP-II AF PIU and provides support to the Executive Director for implementing the MGF subcomponent. All key activities concerning MGF component including: planning, implementation, monitoring, reporting, among others are coordinated and approved by PIU Executive Director. After MGF launch MGF team presents MGF Progress report to PIU Executive Director two times per year (in December and July) for the project duration.

Ministry of Economy and Infrastructure

Ministry of Economy and Infrastructure is the central body to promote the state policy in the field of economics and coordinate economic development of the country. <http://www.mei.gov.md/>. The Ministry of Economy and Infrastructure established the PIU as a dedicated legal entity, reporting to MEI, to implement CEP (through Government decision No. 895 of August 25, 2005). So, the PIU Executive Director discusses, consults and agrees all key MGF aspects with MEI, in particular regarding: MGF industrial sectors, MGF Beneficiaries; MGF rules, MGF Agreements, MGF workshops and other events, etc.

Representatives of MEI will be part of the Technical and Validation Committee and also will participate in the monitoring measure (on site visits).

After MGF launch two times per year (in December and July) MGF team presents MGF Progress report to MEI.

ODIMM and Investment Agency

ODIMM and *Moldovan Investment Agency* play important roles in promoting MSME and export growth. MGF team can consult with these institutions in aspects related to: MGF manual key points, MGF dissemination events, participation in Technical and Validation Committees, consulting on BDS providers, monitoring visits, and evaluation activities, etc.

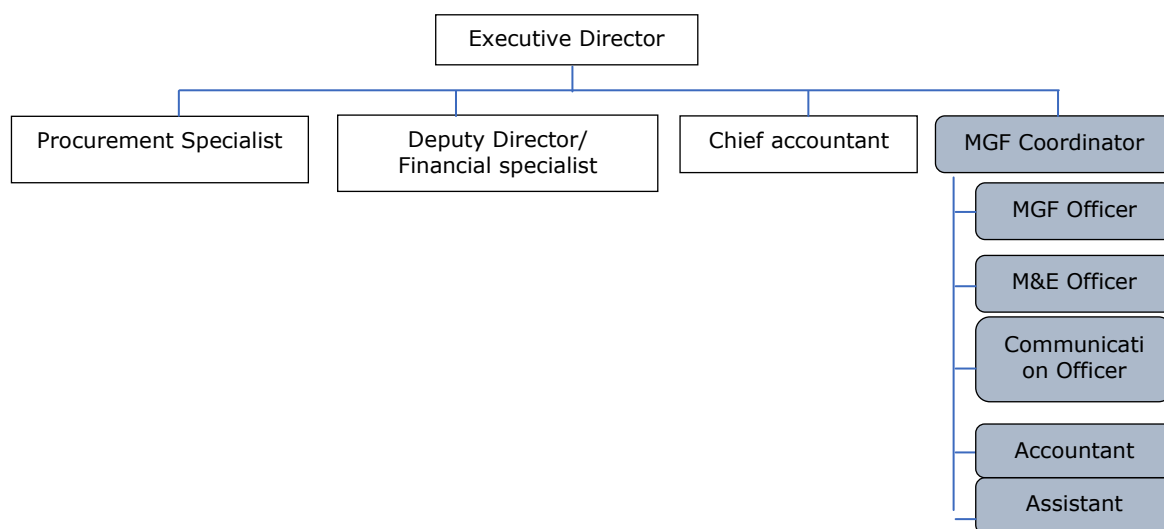
Organisation for MSME development is a structure for the promotion of small business establishment and support for the development of the existing enterprises; <http://odimm.md>

Moldovan investment agency is a public institution coordinating policy implementation for competitiveness, export promotion and investment attraction in Moldova. <http://invest.gov.md/>

The PIU is experienced and adequately staffed. The PIU team is fully equipped with the resources and will be enhanced as needed to carry out social and environment risk management.

The organizational chart of the project implementation unit are as follows:

Project Implementation Unit organigram



The MGF team is responsible for general management, implementation, and supervision of the MGF component. The MGF team is composed of: a MGF Coordinator; a MGF Officer; a Monitoring and Evaluation Officer; a Communication Officer, an Accountant and Administrative Assistant.

The detailed responsibilities of each MGF team position are described below. As well each MGF team member for services to be performed has signed with a PIU a Contract and Terms of Reference and Scope of Services.

The MGF Coordinator works under the supervision of the PIU Executive Director of the CEP-II AF PIU and provides support to the Executive Director for implementing the MGF subcomponent. The MGF Coordinator leads the MGF team for the implementation of all the activities needed to achieve MGF component objectives in compliance with the Project Document, Project operation manual, MGF operations manual and the Moldovan legislation.

The MGF Officer works under the supervision of the MGF Coordinator and provides support to the MGF Coordinator for implementing the MGF subcomponent. The objective of this team member is to assist MGF Coordinator in all aspects related to MGF, in particular to: the development of the MGF manual; the application and implementation procedure; project documents reporting; Beneficiary procurement procedures; communication with key stakeholders, Applicants and Beneficiaries; etc.

The MGF Monitoring & Evaluation Officer works under the supervision of the MGF Coordinator and provides support to the MGF Coordinator for implementing the MGF subcomponent in order to ensure all Monitoring & Evaluation procedures. The project envisages the implementation of the following M&E activities: develop and implement the M&E Strategy, ensure data collection and analysis, monitoring activities on project indicators, evaluation of implementation processes and performance, disseminate the monitoring data and evaluation results, BIPs progress reporting etc.

The MGF Communication Officer works under the supervision of the MGF Coordinator and assists the MGF Coordinator for implementing all communication activities needed to achieve MGF subcomponent's objectives in order to ensure systematic communication about project components progress. The project envisages the implementation of the following communication activities: develop and implement the Communication Strategy; elaboration of promotional materials; organization of media events; communication with stakeholders, professional and business associations, sectorial organizations, etc., dissemination of information to potential beneficiaries and constant attraction of a pool of applicants; design and broadcast TV and radio spots; maintaining an updated website and updating of social media channels, etc.

The MGF Accountant main responsibilities consist of the following: to provide assistance to the Chief accountant on financial aspects of the MGF component; preliminary evaluation of the financial documents received from providers and their preparation for payment; provide financial assistance and support to the MGF Beneficiaries and service providers; assist to the verification of invoices, bills and other relevant documents received from MGF Beneficiaries according to the operations manual requirements; assist with preparation of payment orders, primary documents for performing bank operations; etc.

In context of this LMP implementation, the staff assigned by PIU's Environmental and Social Consultants will be responsible for the following:

- Implementing the LMP;
- Ensuring that the Companies comply with the LMP;
- Monitoring that the Companies meet the labor and OHS obligations toward the contracted and subcontracted workers, as required by the Moldovan legislation in force and ESS2;
- Monitoring Companies and sub-contractors' implementation of labor management procedures and ESMPs;
- Monitoring compliance with occupational health and safety norms at all workplaces in line with the national occupational health and safety legislation;
- Monitoring and implement training on LMP and OHS for project workers;
- Ensuring that the grievance redress mechanism for project workers is established and implemented and that workers are informed of its purpose and how to use it;
- Have in place a system for regular monitoring and reporting on labor and occupational safety and health performance.

The Companies beneficiary firms (SMEs) will be responsible for the following:

- To obey the requirements of the national legislation and the LPM;
- To develop “Occupational Health and Safety Plan”, which will apply to contracted and sub-contracted workers. These procedures and plans will be submitted for review and approval to PIU.
- To maintain the records of recruitment and employment process for the contracted workers;
- To communicate clearly the job description and the employment conditions to all contracted workers;
- To have a system for regular review and reporting on labor, and occupational safety and health performance.
- A Grievance Redress Mechanism (GRM) has been detailed within this LMP in line with ESMF. The Companies will be required to comply with the GRM provisions.
- The SMEs will be fully responsible to ensure that their workers know and are trained on their obligations with respect to GBV, safe disposal of wastes and reporting of communicable diseases, if they contract any.
- The company will develop and implement a Code of Conduct. The construction contractor should also submit a Code of Conduct for review and approval to PIU. The Code of Conduct will reflect the company’s core values and overall working culture including prohibition of any type of harassment and will include provisions related to gender-based violence (GBV).
- The Companies are required to ensure that the assigned workers are adequately trained and briefed with overall safety arrangement, use of equipment, GRM procedures, and the working conditions under the project.

7. POLICIES AND PROCEDURES

As set out in the Labor Code, project workers' jobs will be based on non-discrimination laws and equal opportunities. There will be no discrimination regarding any aspects of the employment relationship including recruitment, working conditions compensation, and terms of employment, access to training, promotion or termination of employment. PIU will incorporate such standardized social clauses in the tender documentation and contract documents so that the potential bidders are aware of the social / labor performance requirement. No major gaps can be found in local legislation because is harmonized mostly with ILO policies.

No forced and under-aged labor will be engaged by PIU, Companies, Suppliers, sub-contractor or any stakeholder in any circumstance. Forced labor includes bonded labor, excessive notice period, retaining worker’s identity, limitations of freedom of movement and substantial fines, physical punishment, under high unpayable debt or any other condition where the project worker is compelled to work in a non-voluntary basis.

Occupational Safety and Health

All the Companies under the project will have to comply with the Moldovan OHS legislation and the Labor Code, as well as the provisions set under the World Bank’s ESS2. The Companies will have to prepare or adjust their internal regulations, in case they do not comply with the current legislation. They will also make them known and available to their staff and workers. According to national legislation, the obligations of the employer are to provide a healthy work environment; the obligation to assign an individual who will be responsible for the OHS

arrangements at work and on site; describe and explain the main risks of the work involved to the employee; train the employees and workers on the OHS arrangements at the enterprise; provide appropriate protective equipment, clothing and gear to mitigate the potential risks; record and report the work incidents on site; ensure that first-aid help is available on site and have emergency and evacuation protocols in place and explained to the staff and workers for emergency cases. The PIU will guide to:

- Comply with OHS related legislation and other, related applicable requirement.
- Ensure transparent recruitment process that is open with respect to ethnicity, religion, disability or gender.
- Enable active involvement in OHS risk elimination by promoting adequate hazard skills, knowledge and attitudes.
- Continuously improving the process and efficiency of OHS implementation.
- Make this policy statement available to all interested parties at all project sites and facilities.
- Under current rules of Moldova the Companies are required to have at least one occupational health and safety representative for the worksite. The representative must:
 - Conduct regular OHS training to workers
 - Identify any potential hazard
 - In case of an accident, investigate the cause and report the PIU
 - Ensure that all the workers are taking the required safety measures during workhours.
 - Ensure availability of first aid box at worksite.

PIU will conduct regular monitoring to ensure proper OHS implementation. The OHS representative will be responsible to provide regular reports to ESS unit of PIU.

Gender Based Violence

The contractor is required to address the risk of gender-based violence by providing training and awareness raising sessions for the workers to refrain from any unacceptable conduct towards local community members, particularly women. Moreover, the contractor is obliged to inform their workers about the legal consequences and punishment by law of sexual harassment and gender-based violence.

In addition, the above statement, each of the contractor and construction companies shall include GBV prevention to their labor management plans.

Non-discriminatory Nature of Employment

All the workers hired under the project, whether direct, contracted or sub-contracted, will be employed based on the principles of non-discrimination. As per Article 8 of the Moldovan Labor Code, any discrimination based on gender, age, race, ethnicity, political option, social origin, residence, handicap, status or trade union activity, as well as other criteria not related to his/her professional qualities, shall be prohibited.

Terms of Employment

All workers will have written contracts describing terms and conditions of work. Workers will sign the employment contract in two originals. The terms and conditions of employment will be available at the work sites. Every worker, when employed, will be briefed on the contents of the contract; the internal regulations of the institution; the work safety and OHS arrangements at the work place. All employees will be informed about the possibility to request a copy and to study these internal documents in more detail.

Employee Rights and Obligations

The Moldovan legislation specifies, among others, that the employees have the right to a safe working environment; lunch breaks and rest days; timely payment of wages and salaries; the right to appeal to employers, trade unions and authorities in case of labor disputes; the right to associate freely.

General requirements at workplaces

According to the Government Decision of the Republic of Moldova no. 80 of February 09, 2012 regarding the minimum safety and health requirements for temporary or mobile sites, the Contractor must provide workers with good hygiene standards, with fresh drinking water, clean beds, enough blankets, restrooms and showers, clean bedrooms, good illumination, lockers, proper ventilation, safe electrical installation, fire and lightning protection, separate cooking and eating areas. The recreation and / or accommodation rooms must be equipped with a sufficient number of tables and chairs, corresponding to the number of workers. If there is no room for recreation and / or accommodation, other facilities must be made available to workers so that they can use them during work interruption.

Useful References

A complete labor guide for employers and Companies is available on the website of Moldovan Labor Inspectorate at: <https://ism.gov.md/ro/content/ghid-pentru-angajatori>. Article 199 of the Labor Code provides the minimum structure of the internal regulations of an enterprise. Sample internal regulations for Companies can be found by following the link: <http://editurastatistica.md/sites/default/files/2019/Regulament%20intern%20I.S.%20Editura%20de%20Imprimarie%20STATISTICA.pdf> . The protection of employees during Covid-19 pandemic:

https://msmps.gov.md/sites/default/files/ghid_practic_print.pdf

The COVID-19 prevention measures contain recommendations from the World Bank/WHO, as well as recommendations from the Moldova's in the form of a Guide, that the Contractor of the construction works needs to implement. The Contractor is required to follow/update and implement the measures that are currently in force and adopted by the Government as binding at national level. Official site for information related to COVID-19 on national level is www.msmps.gov.md and www.ansp.md.

8. AGE OF EMPLOYMENT

The minimum age for employment under the project is 18 years. Therefore, the Companies will not hire individuals less than 18 years. They will be required to verify the age of all workers. If a child under the minimum age is discovered working under the project, the relevant supervisor will take the required actions to terminate responsibly the employment of the child, considering the best interest of the child.

9. TERMS AND CONDITIONS

The terms and conditions of employment applied to all the types of project workers shall be governed by the internal regulations of Companies and suppliers in line with the Moldovan Labor Code and other national labor-related legislation. These terms and conditions will be

clearly mentioned in the written contracts for all type of workers, whether full-time or part-time, and be made known to project workers prior to contract signature.

The working hours are 40 per week for all workers. The number of weekly overtime hours and the payment of overtime shall be governed by the provisions of the Moldovan Labor Code, which is in line with the ESS2.

There is no project-wide collective labor agreement.

10. GRIEVANCE MECHANISM

PIU will provide an effective grievance mechanism for workers to raise workplace problems and concerns. The grievance mechanism will be established by the beginning of the project implementation and will be maintained over the project life. PIU will be the main body for receiving, recording and tracking resolution of grievances.

Addressing grievances raised by individual affected by World Bank funded projects is an important component of managing project risks and for mitigation strategies. The GRM can serve as an effective tool for early identification, assessment and resolution of grievances and therefore for strengthening accountability to beneficiaries. The GRM is an important feedback mechanism that can improve project impact and respond to concerns and grievances of project-affected parties related to the environmental and social performance of the project in a timely manner. Due to ongoing COVID-19 safety concerns, with restrictions on movement, it is important that, where possible, staff managing grievances can access systems and work remotely to enable processes to work effectively.

The grievance mechanism for project workers required under ESS2 will be provided separately. All project workers are encouraged to use the existing project grievance mechanism to raise workplace concerns, report concerns related to COVID-19, preparations being made by the project to address COVID-19 related issues, how procedures are being implemented, and concerns about the health of their co-workers and other staff.

Channels to Make Complaints: Due to COVID-19, the project has to provide the extend ways whereby grievances would be received. The suggestions/complaints can be submitted by e-mail, website, telephone, mail, etc. The template for grievances will be provided. To make grievance mechanisms accessible to all stakeholders, it is helpful to make the procedures to submit grievances simple and easy to understand and provide an opportunity to submit a grievance anonymously. The channels for filing complaints will be listed communicated to the public during the consultations. The PIU intends to establish the following channels through which citizens/beneficiaries/ PAPs can make complaints/suggestions/compliments regarding CEP II AF activities:

- a) in writing:
 - by email: MEI/ PIU
 - letters: MEI/ PIU
- b) oral/verbal (which should be recorded in writing by the receiver):
 - by phone
 - verbal complaints addressed to the MEI/ PIU

For GBV, and particularly for SEA/ SH complaints, there are risks of stigmatization, rejection and reprisals against survivors. The GRM therefore have multiple channels through which complaints can be registered in a safe and confidential manner.

Project-affected parties may submit complaints regarding the Bank-financed activities to the original project grievance mechanism or the World Bank's corporate Grievance Redress Service:

The Project-level GRM will be established at 3 levels:

Level 1. MGF and PFIs

The supervisors/ Grievance Focal Point(s) will be responsible for collecting the grievance from target groups and Contractor's employees. The channels for grievance submission will be disclosed for all applicants for Projects' grants.

Level 2. PIU. the complainant will be able to submit grievance to PIU on:

e-mail: piu@mei.gov.md

postal address: 180, Stefan cel Mare si Sfânt ave, office 813, MD 2004

by telephone: 022 296724

The GRM will be also accessible online on the PIU website <http://uipac.md/rom/sugestii-si-reclamatii>.

Level 3. MEI. Complainants may fill in online form following the provided on-line link or fill in the template and send to:

online: <https://mei.gov.md/ro/content/petitia-line>.

e-mail: secretariat@mei.gov.md

postal address: Ministry of Economy and Infrastructure, MD-2012 Chisinau, Piata Marii Adunari Nationale, 1, street

by telephone: 022 250 500 (green/ trust line)

ii) **The World Bank's corporate Grievance Redress Service.** Communities and individuals who believe that they are adversely affected by a World Bank supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit :

<http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service>. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

It is important that all complaints, including the anonymous ones, to be recorded in writing and stored in a database. Complaints received should be assigned a number that will help the assigned specialist to track progress via the database. The database should at least contain relevant information on the date of submission, sphere of issue, responsible party, deadline for the problem solving and feedback (positive or negative). The Grievance log will be submitted to the Bank of quarterly basis for review.

The GRM log will be regularly (monthly base) sent to MEI and WB for information.

11. CONTRACTOR MANAGEMENT

The project will use the Bank's 2019 Standard Procurement Document or other WB Procurement Rules and Procedures for small scale procurement, both will include provisions referring to labor

and occupational, health and safety requirements that must comply with the Moldovan national legislation and ESS2.

As part of selection process for the Companies, who will receive the support, PIU may review the following information:

- Information in public records, for example, corporate registers and public documents related to violations of applicable labor law, including reports from labor inspectorates and other enforcement bodies;
- Business licenses, registrations, permits, and approvals;
- Documents related to a labor management system, including OHS issues, for example, labor management procedures;
- Identification of labor management, safety, and health personnel, their qualifications, and certifications;
- Workers' certifications/permits/training to perform required work;
- Records of safety and health violations, and responses;
- Accident and fatality records and notifications to authorities;
- Records of legally required worker benefits and proof of workers' enrollment in the related programs;
- Worker payroll records, including hours worked and payment received;
- Identification of safety committee members and records of meetings; and
- Copies of previous contracts with the Companies and suppliers, showing the provisions and terms reflecting ESS2.

PIU assigned staff will monitor the performance of beneficiary firms in relation to the contracted workers. This may include periodic audits, inspections, and/or spot checks of locations or production sites and/or of labor management records and reports compiled by Companies.

Companies' labor management records and reports may include: (a) a representative sample of employment contracts or arrangements between third parties and contracted workers; (b) records related to grievances received and their resolution; (c) reports related to safety inspections, including fatalities and incidents and implementation of corrective actions; (d) records related to incidents of non-compliance with the national law; and (e) records of training provided for contracted workers to explain labor and working conditions and OHS provisions under the project.

12. COMMUNITY WORKERS

A difficult to estimate number of community workers may be involved under the sub-projects. The Companies - beneficiary firms will decide if they will hire community workers for skilled and unskilled jobs. The condition of employment has to be similar to other workers. The PIU will assess whether there is a risk of child labor or forced labor within community labor, identifying those risks consistent with ESS2. The PIU and state labor inspection may monitor community workers. If cases of child labor or forced labor are identified, the PIU will take appropriate steps to remedy them.

The PIU will ensure that GBV risks for community workers are adequately prevented and mitigated. The prevention measures will include, but will not be limited to: Code of Conduct for all employees, GBV-sensitized grievance mechanism, awareness raising of all employees on GBV risks and mitigation measures.

13. PRIMARY SUPPLY WORKERS

At this moment PIU will not directly procure any primary supply contracts. The firms who subcontract the supply of materials and equipment for the implementation of financed project works will be responsible to include the same conditions and specifications on ESHS aspects into its subcontracting agreements.

Annex K. COVID-19 Considerations in Construction/Civil Works

This note was issued on April 7, 2020 and includes links to the latest guidance as of this date (e.g. from WHO). Given the COVID-19 situation is rapidly evolving, when using this note it is important to check whether any updates to these external resources have been issued.

1. INTRODUCTION

The COVID-19 pandemic presents Governments with unprecedented challenges. Addressing COVID-19 related issues in both existing and new operations starts with recognizing that this is not business as usual and that circumstances require a highly adaptive responsive management design to avoid, minimize and manage what may be a rapidly evolving situation. In many cases, we will ask Borrowers to use reasonable efforts in the circumstances, recognizing that what may be possible today may be different next week (both positively, because more supplies and guidance may be available, and negatively, because the spread of the virus may have accelerated).

This interim note is intended to provide guidance to teams on how to support Borrowers in addressing key issues associated with COVID-19 and consolidates the advice that has already been provided over the past month. As such, it should be used in place of other guidance that has been provided to date. This note will be developed as the global situation and the Bank's learning (and that of others) develops. This is not a time when 'one size fits all'. More than ever, teams will need to work with Borrowers and projects to understand the activities being carried out and the risks that these activities may entail. Support will be needed in designing mitigation measures that are implementable in the context of the project. These measures will need to consider capacity of the Government agencies, availability of supplies and the practical challenges of operations on-the-ground, including stakeholder engagement, supervision and monitoring. In many circumstances, communication itself may be challenging, where face-to-face meetings are restricted or prohibited, and where IT solutions are limited or unreliable.

This note emphasizes the importance of careful scenario planning, clear procedures and protocols, management systems, effective communication and coordination, and the need for high levels of responsiveness in a changing environment. It recommends assessing the current situation of the project, putting in place mitigation measures to avoid or minimize the chance of infection, and planning what to do if either project workers become infected or the work force includes workers from proximate communities affected by COVID-19. In many projects, measures to avoid or minimize will need to be implemented at the same time as dealing with sick workers and relations with the community, some of whom may also be ill or concerned about infection. Borrowers should understand the obligations that contractors have under their existing contracts (see Section 3), require contractors to put in place appropriate organizational structures (see Section 4) and develop procedures to address different aspects of COVID-19 (see Section 5).

2. CHALLENGES WITH CONSTRUCTION/CIVIL WORKS

Projects involving construction/civil works frequently involve a large work force, together with suppliers and supporting functions and services. The work force may comprise workers from international, national, regional, and local labor markets. They may need to live in on-site accommodation, lodge within communities close to work sites or return to their homes after work. There may be different contractors permanently present on site, carrying out different activities, each with their own dedicated workers. Supply chains may involve international, regional and national suppliers facilitating the regular flow of goods and services to the project (including supplies essential to the project such as fuel, food, and

water). As such there will also be regular flow of parties entering and exiting the site; support services, such as catering, cleaning services, equipment, material and supply deliveries, and specialist sub-contractors, brought in to deliver specific elements of the works.

Given the complexity and the concentrated number of workers, the potential for the spread of infectious disease in projects involving construction is extremely serious, as are the implications of such a spread. Projects may experience large numbers of the work force becoming ill, which will strain the project's health facilities, have implications for local emergency and health services and may jeopardize the progress of the construction work and the schedule of the project. Such impacts will be exacerbated where a work force is large and/or the project is in remote or under-serviced areas. In such circumstances, relationships with the community can be strained or difficult and conflict can arise, particularly if people feel they are being exposed to disease by the project or are having to compete for scarce resources. The project must also exercise appropriate precautions against introducing the infection to local communities.

3. DOES THE CONSTRUCTION CONTRACT COVER THIS SITUATION?

Given the unprecedented nature of the COVID-19 pandemic, it is unlikely that the existing construction/civil works contracts will cover all the things that a prudent contractor will need to do. Nevertheless, the first place for a Borrower to start is with the contract, determining what a contractor's existing obligations are, and how these relate to the current situation.

The obligations on health and safety will depend on what kind of contract exists (between the Borrower and the main contractor; between the main contractors and the sub-contractors). It will differ if the Borrower used the World Bank's standard procurement documents (SPDs) or used national bidding documents. If a FIDIC document has been used, there will be general provisions relating to health and safety. For example, the standard FIDIC, Conditions of Contract for Construction (Second Edition 2017), which contains no 'ESF enhancements', states (in the General Conditions, clause 6.7) that the Contractor will be required:

- to take all necessary precautions to maintain the health and safety of the Contractor's Personnel
- to appoint a health and safety officer at site, who will have the authority to issue directives for the purpose of maintaining the health and safety of all personnel authorized to enter and or work on the site and to take protective measures to prevent accidents
- to ensure, in collaboration with local health authorities, that medical staff, first aid facilities, sick bay, ambulance services and any other medical services specified are always available at the site and at any accommodation
- to ensure suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics

These requirements have been enhanced through the introduction of the ESF into the SPs (edition dated July 2019). The general FIDIC clause referred to above has been strengthened to reflect the requirements of the ESF. Beyond FIDIC's general requirements discussed above, the Bank's Particular Conditions include a number of relevant requirements on the Contractor, including:

- to provide health and safety training for Contractor's Personnel (which include project workers and all personnel that the Contractor uses on site, including staff and other employees of the Contractor and Subcontractors and any other personnel assisting the Contractor in carrying out project activities)
- to put in place workplace processes for Contractor's Personnel to report work situations that are not safe or healthy
- gives Contractor's Personnel the right to report work situations which they believe are not safe or healthy, and to remove themselves from a work situation which they have a reasonable justification to believe presents an imminent and serious danger to their life or health (with no reprisal for reporting or removing themselves)
- requires measures to be in place to avoid or minimize the spread of diseases including

- measures to avoid or minimize the transmission of communicable diseases that may be associated with the influx of temporary or permanent contract-related labor
- to provide an easily accessible grievance mechanism to raise workplace concerns

Where the contract form used is FIDIC, the Borrower (as the Employer) will be represented by the Engineer (also referred to in this note as the Supervising Engineer). The Engineer will be authorized to exercise authority specified in or necessarily implied from the construction contract. In such cases, the Engineer (through its staff on site) will be the interface between the PIU and the Contractor. It is important therefore to understand the scope of the Engineer's responsibilities. It is also important to recognize that in the case of infectious diseases such as COVID-19, project management – through the Contractor/subcontractor hierarchy – is only as effective as the weakest link. A thorough review of management procedures/plans as they will be implemented through the entire contractor hierarchy is important. Existing contracts provide the outline of this structure; they form the basis for the Borrower to understand how proposed mitigation measures will be designed and how adaptive management will be implemented, and to start a conversation with the Contractor on measures to address COVID-19 in the project.

4. WHAT PLANNING SHOULD THE BORROWER BE DOING?

Task teams should work with Borrowers (PIUs) to confirm that projects (i) are taking adequate precautions to prevent or minimize an outbreak of COVID-19, and (ii) have identified what to do in the event of an outbreak. Suggestions on how to do this are set out below:

- The PIU, either directly or through the Supervising Engineer, should request details in writing from the main Contractor of the measures being taken to address the risks. As stated in Section 3, the construction contract should include health and safety requirements, and these can be used as the basis for identification of, and requirements to implement, COVID-19 specific measures. The measures may be presented as a contingency plan, as an extension of the existing project emergency and preparedness plan or as standalone procedures. The measures may be reflected in revisions to the project's health and safety manual. This request should be made in writing (following any relevant procedure set out in the contract between the Borrower and the contractor).
- In making the request, it may be helpful for the PIU to specify the areas that should be covered. This should include the items set out in Section 5 below and take into account current and relevant guidance provided by national authorities, WHO and other organizations. See the list of references in the Annex to this note.
- The PIU should require the Contractor to convene regular meetings with the project health and safety specialists and medical staff (and where appropriate the local health authorities), and to take their advice in designing and implementing the agreed measures.
- Where possible, a senior person should be identified as a focal point to deal with COVID-19 issues. This can be a work supervisor or a health and safety specialist. This person can be responsible for coordinating preparation of the site and making sure that the measures taken are communicated to the workers, those entering the site and the local community. It is also advisable to designate at least one back-up person, in case the focal point becomes ill; that person should be aware of the arrangements that are in place.
- On sites where there are a number of contractors and therefore (in effect) different work forces, the request should emphasize the importance of coordination and communication between the different parties. Where necessary, the PIU should request the main contractor to put in place a protocol for regular meetings of the different contractors, requiring each to appoint a designated staff member (with back up) to attend such meetings. If meetings cannot be held in person, they should be conducted using whatever IT is available. The effectiveness of mitigation measures will depend on the weakest implementation, and therefore it is important that all contractors and sub-contractors understand the risks and the procedure to be followed.
- The PIU, either directly or through the Supervising Engineer, may provide support to projects in identifying appropriate mitigation measures, particularly where these will involve

interface with local services, in particular health and emergency services. In many cases, the PIU can play a valuable role in connecting project representatives with local Government agencies, and helping coordinate a strategic response, which takes into account the availability of resources. To be most effective, projects should consult and coordinate with relevant Government agencies and other projects in the vicinity.

- Workers should be encouraged to use the existing project grievance mechanism to report concerns relating to COVID-19, preparations being made by the project to address COVID-19 related issues, how procedures are being implemented, and concerns about the health of their co-workers and other staff.

5. WHAT SHOULD THE CONTRACTOR COVER?

The Contractor should identify measures to address the COVID-19 situation. What will be possible will depend on the context of the project: the location, existing project resources, availability of supplies, capacity of local emergency/health services, the extent to which the virus already exist in the area. A systematic approach to planning, recognizing the challenges associated with rapidly changing circumstances, will help the project put in place the best measures possible to address the situation. As discussed above, measures to address COVID-19 may be presented in different ways (as a contingency plan, as an extension of the existing project emergency and preparedness plan or as standalone procedures). PIUs and contractors should refer to guidance issued by relevant authorities, both national and international (e.g. WHO), which is regularly updated (see sample References and links provided).

Addressing COVID-19 at a project site goes beyond occupational health and safety and is a broader project issue which will require the involvement of different members of a project management team. In many cases, the most effective approach will be to establish procedures to address the issues, and then to ensure that these procedures are implemented systematically. Where appropriate given the project context, a designated team should be established to address COVID-19 issues, including PIU representatives, the Supervising Engineer, management (e.g. the project manager) of the contractor and sub-contractors, security, and medical and OHS professionals. Procedures should be clear and straightforward, improved as necessary, and supervised and monitored by the COVID-19 focal point(s). Procedures should be documented, distributed to all contractors, and discussed at regular meetings to facilitate adaptive management. The issues set out below include a number that represent expected good workplace management but are especially pertinent in preparing the project response to COVID-19.

(a) ASSESSING WORKFORCE CHARACTERISTICS

Many construction sites will have a mix of workers, e.g. workers from the local communities; workers from a different part of the country; workers from another country. Workers will be employed under different terms and conditions and be accommodated in different ways. Assessing these different aspects of the workforce will help in identifying appropriate mitigation measures:

- The Contractor should prepare a detailed profile of the project work force, key work activities, schedule for carrying out such activities, different durations of contract and rotations (e.g. 4 weeks on, 4 weeks off).
- This should include a breakdown of workers who reside at home (i.e. workers from the community), workers who lodge within the local community and workers in on-site accommodation. Where possible, it should also identify workers that may be more at risk from COVID-19, those with underlying health issues or who may be otherwise at risk.
- Consideration should be given to ways in which to minimize movement in and out of site. This could include lengthening the term of existing contracts, to avoid workers returning home to affected areas, or returning to site from affected areas.
- Workers accommodated on site should be required to minimize contact with people near the site, and in certain cases be prohibited from leaving the site for the duration of their contract, so that contact with local communities is avoided.
- Consideration should be given to requiring workers lodging in the local community to move

to site accommodation (subject to availability) where they would be subject to the same restrictions.

- Workers from local communities, who return home daily, weekly or monthly, will be more difficult to manage. They should be subject to health checks at entry to the site (as set out above) and at some point, circumstances may make it necessary to require them to either use accommodation on site or not to come to work.

(b) ENTRY/EXIT TO THE WORK SITE AND CHECKS ON COMMENCEMENT OF WORK

Entry/exit to the work site should be controlled and documented for both workers and other parties, including support staff and suppliers. Possible measures may include:

- Establishing a system for controlling entry/exit to the site, securing the boundaries of the site, and establishing designating entry/exit points (if they do not already exist). Entry/exit to the site should be documented.
- Training security staff on the (enhanced) system that has been put in place for securing the site and controlling entry and exit, the behaviors required of them in enforcing such system and any COVID -19 specific considerations.
- Training staff who will be monitoring entry to the site, providing them with the resources they need to document entry of workers, conducting temperature checks and recording details of any worker that is denied entry.
- Confirming that workers are fit for work before they enter the site or start work. While procedures should already be in place for this, special attention should be paid to workers with underlying health issues or who may be otherwise at risk. Consideration should be given to demobilization of staff with underlying health issues.
- Checking and recording temperatures of workers and other people entering the site or requiring self-reporting prior to or on entering the site.
- Providing daily briefings to workers prior to commencing work, focusing on COVID-19 specific considerations including cough etiquette, hand hygiene and distancing measures, using demonstrations and participatory methods.
- During the daily briefings, reminding workers to self-monitor for possible symptoms (fever, cough) and to report to their supervisor or the COVID-19 focal point if they have symptoms or are feeling unwell.
- Preventing a worker from an affected area or who has been in contact with an infected person from returning to the site for 14 days or (if that is not possible) isolating such worker for 14 days.
- Preventing a sick worker from entering the site, referring them to local health facilities if necessary or requiring them to isolate at home for 14 days.

(c) GENERAL HYGIENE

Requirements on general hygiene should be communicated and monitored, to include:

- Training workers and staff on site on the signs and symptoms of COVID-19, how it is spread, how to protect themselves (including regular handwashing and social distancing) and what to do if they or other people have symptoms (for further information see WHO COVID-19 advice for the public).
- Placing posters and signs around the site, with images and text in local languages.
- Ensuring handwashing facilities supplied with soap, disposable paper towels and closed waste bins exist at key places throughout site, including at entrances/exits to work areas; where there is a toilet, canteen or food distribution, or provision of drinking water; in worker accommodation; at waste stations; at stores; and in common spaces. Where handwashing facilities do not exist or are not adequate, arrangements should be made to set them up. Alcohol based sanitizer (if available, 60-95% alcohol) can also be used.
- Review worker accommodations and assess them considering the requirements set out in IFC/EBRD guidance on Workers' Accommodation: processes and standards, which provides valuable guidance as to good practice for accommodation.
- Setting aside part of worker accommodation for precautionary self-quarantine as well as more formal isolation of staff who may be infected (see paragraph (f)).

(d) CLEANING AND WASTE DISPOSAL

Conduct regular and thorough cleaning of all site facilities, including offices, accommodation, canteens, common spaces. Review cleaning protocols for key construction equipment (particularly if it is being operated by different workers). This should include:

- Providing cleaning staff with adequate cleaning equipment, materials and disinfectant.
- Review general cleaning systems, training cleaning staff on appropriate cleaning procedures and appropriate frequency in high use or high-risk areas.
- Where it is anticipated that cleaners will be required to clean areas that have been or are suspected to have been contaminated with COVID-19, providing them with appropriate PPE: gowns or aprons, gloves, eye protection (masks, goggles or face screens) and boots or closed work shoes. If appropriate PPE is not available, cleaners should be provided with best available alternatives.
- Training cleaners in proper hygiene (including handwashing) prior to, during and after conducting cleaning activities; how to safely use PPE (where required); in waste control (including for used PPE and cleaning materials).
- Any medical waste produced during the care of ill workers should be collected safely in designated containers or bags and treated and disposed of following relevant requirements (e.g., national, WHO). If open burning and incineration of medical wastes is necessary, this should be for as limited a duration as possible. Waste should be reduced and segregated, so that only the smallest amount of waste is incinerated (for further information see WHO interim guidance on water, sanitation and waste management for COVID-19).

(e) ADJUSTING WORK PRACTICES

Consider changes to work processes and timings to reduce or minimize contact between workers, recognizing that this is likely to impact the project schedule. Such measures could include:

- Decreasing the size of work teams.
- Limiting the number of workers on site at any one time.
- Changing to a 24-hour work rotation.
- Adapting or redesigning work processes for specific work activities and tasks to enable social distancing, and training workers on these processes.
- Continuing with the usual safety trainings, adding COVID-19 specific considerations. Training should include proper use of normal PPE. While as of the date of this note, general advice is that construction workers do not require COVID-19 specific PPE, this should be kept under review (for further information see WHO interim guidance on rational use of personal protective equipment (PPE) for COVID-19).
- Reviewing work methods to reduce use of construction PPE, in case supplies become scarce or the PPE is needed for medical workers or cleaners. This could include, e.g. trying to reduce the need for dust masks by checking that water sprinkling systems are in good working order and are maintained or reducing the speed limit for haul trucks.
- Arranging (where possible) for work breaks to be taken in outdoor areas within the site.
- Consider changing canteen layouts and phasing mealtimes to allow for social distancing and phasing access to and/or temporarily restricting access to leisure facilities that may exist on site, including gyms.
- At some point, it may be necessary to review the overall project schedule, to assess the extent to which it needs to be adjusted (or work stopped completely) to reflect prudent work practices, potential exposure of both workers and the community and availability of supplies, taking into account Government advice and instructions.

(f) PROJECT MEDICAL SERVICES

Consider whether existing project medical services are adequate, considering existing infrastructure (size of clinic/medical post, number of beds, isolation facilities), medical staff, equipment and supplies, procedures and training. Where these are not adequate, consider upgrading services where possible, including:

- Expanding medical infrastructure and preparing areas where patients can be isolated. Guidance on setting up isolation facilities is set out in WHO interim guidance on considerations for quarantine of individuals in the context of containment for COVID-19). Isolation facilities should be located away from worker accommodation and ongoing work activities. Where possible, workers should be provided with a single well-ventilated room (open windows and door). Where this is not possible, isolation facilities should allow at least 1 meter between workers in the same room, separating workers with curtains, if possible. Sick workers should limit their movements, avoiding common areas and facilities and not be allowed visitors until they have been clear of symptoms for 14 days. If they need to use common areas and facilities (e.g. kitchens or canteens), they should only do so when unaffected workers are not present and the area/facilities should be cleaned prior to and after such use.
- Training medical staff, which should include current WHO advice on COVID-19 and recommendations on the specifics of COVID-19. Where COVID-19 infection is suspected, medical providers on site should follow WHO interim guidance on infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected.
- Training medical staff in testing, if testing is available.
- Assessing the current stock of equipment, supplies and medicines on site, and obtaining additional stock, where required and possible. This could include medical PPE, such as gowns, aprons, medical masks, gloves, and eye protection. Refer to WHO guidance as to what is advised (for further information see WHO interim guidance on rational use of personal protective equipment (PPE) for COVID-19).
- If PPE items are unavailable due to world-wide shortages, medical staff on the project should agree on alternatives and try to procure them. Alternatives that may commonly be found on construction sites include dust masks, construction gloves and eye goggles. While these items are not recommended, they should be used as a last resort if no medical PPE is available.
- Ventilators will not normally be available on work sites, and in any event, intubation should only be conducted by experienced medical staff. If a worker is extremely ill and unable to breathe properly on his or her own, they should be referred immediately to the local hospital (see (g) below).
- Review existing methods for dealing with medical waste, including systems for storage and disposal (for further information see WHO interim guidance on water, sanitation and waste management for COVID-19, and WHO guidance on safe management of wastes from health-care activities).

(g) LOCAL MEDICAL AND OTHER SERVICES

Given the limited scope of project medical services, the project may need to refer sick workers to local medical services. Preparation for this includes:

- Obtaining information as to the resources and capacity of local medical services (e.g. number of beds, availability of trained staff and essential supplies).
- Conducting preliminary discussions with specific medical facilities, to agree what should be done in the event of ill workers needing to be referred.
- Considering ways in which the project may be able to support local medical services in preparing for members of the community becoming ill, recognizing that the elderly or those with pre-existing medical conditions require additional support to access appropriate treatment if they become ill.
- Clarifying the way in which an ill worker will be transported to the medical facility and checking availability of such transportation.
- Establishing an agreed protocol for communications with local emergency/medical services.
- Agreeing with the local medical services/specific medical facilities the scope of services to be provided, the procedure for in-take of patients and (where relevant) any costs or payments that may be involved.
- A procedure should also be prepared so that project management knows what to do in the unfortunate event that a worker ill with COVID-19 dies. While normal project procedures will continue to apply, COVID-19 may raise other issues because of the infectious nature of the disease. The project should liaise with the relevant local authorities to coordinate what should

be done, including any reporting or other requirements under national law.

(h) INSTANCES OR SPREAD OF THE VIRUS

WHO provides detailed advice on what should be done to treat a person who becomes sick or displays symptoms that could be associated with the COVID-19 virus (for further information see WHO interim guidance on infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected). The project should set out risk-based procedures to be followed, with differentiated approaches based on case severity (mild, moderate, severe, critical) and risk factors (such as age, hypertension, diabetes) (for further information see WHO interim guidance on operational considerations for case management of COVID-19 in health facility and community). These may include the following:

- If a worker has symptoms of COVID-19 (e.g. fever, dry cough, fatigue) the worker should be removed immediately from work activities and isolated on site.
- If testing is available on site, the worker should be tested on site. If a test is not available at site, the worker should be transported to the local health facilities to be tested (if testing is available).
- If the test is positive for COVID-19 or no testing is available, the worker should continue to be isolated. This will either be at the work site or at home. If at home, the worker should be transported to their home in transportation provided by the project.
- Extensive cleaning procedures with high-alcohol content disinfectant should be undertaken in the area where the worker was present, prior to any further work being undertaken in that area. Tools used by the worker should be cleaned using disinfectant and PPE disposed of.
- Co-workers (i.e. workers with whom the sick worker was in close contact) should be required to stop work, and be required to quarantine themselves for 14 days, even if they have no symptoms.
- Family and other close contacts of the worker should be required to quarantine themselves for 14 days, even if they have no symptoms.
- If a case of COVID-19 is confirmed in a worker on the site, visitors should be restricted from entering the site and worker groups should be isolated from each other as much as possible.
- If workers live at home and has a family member who has a confirmed or suspected case of COVID-19, the worker should quarantine themselves and not be allowed on the project site for 14 days, even if they have no symptoms.
- Workers should continue to be paid throughout periods of illness, isolation or quarantine, or if they are required to stop work, in accordance with national law.
- Medical care (whether on site or in a local hospital or clinic) required by a worker should be paid for by the employer.

(i) CONTINUITY OF SUPPLIES AND PROJECT ACTIVITIES

Where COVID-19 occurs, either in the project site or the community, access to the project site may be restricted, and movement of supplies may be affected.

- Identify back-up individuals, in case key people within the project management team (PIU, Supervising Engineer, Contractor, sub-contractors) become ill, and communicate who these are so that people are aware of the arrangements that have been put in place.
- Document procedures, so that people know what they are, and are not reliant on one person's knowledge.
- Understand the supply chain for necessary supplies of energy, water, food, medical supplies and cleaning equipment, consider how it could be impacted, and what alternatives are available. Early pro-active review of international, regional and national supply chains, especially for those supplies that are critical for the project, is important (e.g. fuel, food, medical, cleaning and other essential supplies). Planning for a 1-2 month interruption of critical goods may be appropriate for projects in more remote areas.
- Place orders for/procure critical supplies. If not available, consider alternatives (where feasible).
- Consider existing security arrangements, and whether these will be adequate in the event of interruption to normal project operations.

- Consider at what point it may become necessary for the project to significantly reduce activities or to stop work completely, and what should be done to prepare for this, and to re-start work when it becomes possible or feasible.

(j) TRAINING AND COMMUNICATION WITH WORKERS

Workers need to be provided with regular opportunities to understand their situation, and how they can best protect themselves, their families and the community. They should be made aware of the procedures that have been put in place by the project, and their own responsibilities in implementing them.

- It is important to be aware that in communities close to the site and amongst workers without access to project management, social media is likely to be a major source of information. This raises the importance of regular information and engagement with workers (e.g. through training, town halls, tool boxes) that emphasizes what management is doing to deal with the risks of COVID-19. Allaying fear is an important aspect of work force peace of mind and business continuity. Workers should be given an opportunity to ask questions, express their concerns, and make suggestions.
- Training of workers should be conducted regularly, as discussed in the sections above, providing workers with a clear understanding of how they are expected to behave and carry out their work duties.
- Training should address issues of discrimination or prejudice if a worker becomes ill and provide an understanding of the trajectory of the virus, where workers return to work.
- Training should cover all issues that would normally be required on the work site, including use of safety procedures, use of construction PPE, occupational health and safety issues, and code of conduct, taking into account that work practices may have been adjusted.
- Communications should be clear, based on fact and designed to be easily understood by workers, for example by displaying posters on handwashing and social distancing, and what to do if a worker displays symptoms.

(k) COMMUNICATION AND CONTACT WITH THE COMMUNITY

Relations with the community should be carefully managed, with a focus on measures that are being implemented to safeguard both workers and the community. The community may be concerned about the presence of non-local workers, or the risks posed to the community by local workers presence on the project site. The project should set out risk-based procedures to be followed, which may reflect WHO guidance (for further information see WHO Risk Communication and Community Engagement (RCCE) Action Plan Guidance COVID-19 Preparedness and Response). The following good practice should be considered:

- Communications should be clear, regular, based on fact and designed to be easily understood by community members.
- Communications should utilize available means. In most cases, face-to-face meetings with the community or community representatives will not be possible. Other forms of communication should be used; posters, pamphlets, radio, text message, electronic meetings. The means used should take into account the ability of different members of the community to access them, to make sure that communication reaches these groups.
- The community should be made aware of procedures put in place at site to address issues related to COVID-19. This should include all measures being implemented to limit or prohibit contact between workers and the community. These need to be communicated clearly, as some measures will have financial implications for the community (e.g. if workers are paying for lodging or using local facilities). The community should be made aware of the procedure for entry/exit to the site, the training being given to workers and the procedure that will be followed by the project if a worker becomes sick.
- If project representatives, contractors or workers are interacting with the community, they should practice social distancing and follow other COVID-19 guidance issued by relevant authorities, both national and international (e.g. WHO).

6. EMERGENCY POWERS AND LEGISLATION

Many Borrowers are enacting emergency legislation. The scope of such legislation, and the way it interacts with other legal requirements, will vary from country to country. Such legislation can cover a range of issues, for example:

- Declaring a public health emergency
- Authorizing the use of police or military in certain activities (e.g. enforcing curfews or restrictions on movement)
- Ordering certain categories of employees to work longer hours, not to take holiday or not to leave their job (e.g. health workers)
- Ordering non-essential workers to stay at home, for reduced pay or compulsory holiday

Except in exceptional circumstances (after referral to the World Bank's Operations Environmental and Social Review Committee (OESRC)), projects will need to follow emergency legislation to the extent that these are mandatory or advisable. It is important that the Borrower understands how mandatory requirements of the legislation will impact the project. Teams should require Borrowers (and in turn, Borrowers should request Contractors) to consider how the emergency legislation will impact the obligations of the Borrower set out in the legal agreement and the obligations set out in the construction contracts. Where the legislation requires a material departure from existing contractual obligations, this should be documented, setting out the relevant provisions.

Annex L. COVID-19 Preparedness Report Template

COVID-19 Response Report should follow the template format provided below. Make sure to provide breakdown between different subprojects, construction sites and/or contractors. Analyze discrepancies and assess their causes, as well as necessary adjustments.

Refer to guidance documents provided previously – COVID-19 Considerations on Construction Civil Works documents (Guidance for Borrower and Guidance for Contractor), Advisory Note on Contingency Planning for existing operations – for examples of mitigation measures/practices for COVID-19 spread prevention/containment etc.

GENERAL INFORMATION	
Name of the project/subproject, Date of the report	
Provide identifying information	
Requirements/guidance on COVID-19 protection issued by the state authority of all levels	
Provide information of legal framework on the issue, the date it became effective, both on national, regional and local (community) level	
Brief description of activities/subprojects which are active, stalled or partially active	
Describe level of activity for each project/subproject (PIU is operational in Client's premises; ongoing civil works on sites, etc.), as well as types of civil works (if ongoing) and number of workers on each site separately and for each subproject/contractor collectively	
(a) ASSESSING WORKFORCE CHARACTERISTICS	
Information on workers accommodation	
For each subproject/contractor, provide information on how many workers live in workers camps, how many live in residential accommodations, hotels, etc.; how many live in their own private residences.	
Transportation to/from work sites and for other work-related reasons	
If workers need to commute to/from work sites from the place of residence, specify the type of transportation (public transport, own vehicle, arranged transportation by the Employer, etc.)	
COVID-19 PREPAREDNESS/RESPONSE MEASURES	
(b)	Entry/exit to the work site and checks on commencement of work
Describe measures taken to secure entrance procedure and medical checks.	
(c)	General hygiene
Describe what are requirements on general hygiene applied for project-related workforce (both PIU and project workers) and how these requirements are communicated	
(d)	Cleaning and waste disposal
Provide review of cleaning protocols (including disinfection) for all site facilities, including offices, accommodation, canteens, common spaces, as well as key construction equipment.	
(e)	Adjusting work practices
Describe what changes to work processes and timings have been done to reduce or minimize contact between workers	
(f)	Project medical services
Provide assessment whether existing project medical services on site are adequate, taking into account existing infrastructure (size of medical post, number of beds, isolation facilities), medical staff, equipment and supplies, procedures and training. If not, describe what measures have been taken to upgrade.	
(g)	Local medical and other services
Provide overview of resources and capacity of local medical services, what procedure is	

established for the event of ill workers needing to be referred. Availability of health facility nearby to refer the patient and agreement between the Contractor and the facility.

(h) Instances or spread of the virus

Describe what is planned to be done to treat a person who becomes sick or displays symptoms that could be associated with the COVID-19 virus

(i) Continuity of supplies and project activities

Assess if COVID-19 restriction will impact supply chains and what arrangement are in place to secure continuity of operation. Specify critical supplies.

(j) CONTINGENCY PLANNING FOR AN OUTBREAK

Measures to address COVID-19 may be presented in different ways – as a contingency plan, as an extension of the existing project emergency and preparedness plan or as standalone procedures. Describe, how such measures are presented for each individual subproject/contractor and when such plan/procedures came into force.

AWARENESS AND COMMUNICATION

(k) Training and communication with workers

Workers should be made aware of the procedures that have been put in place by the project, and their own responsibilities in implementing those procedures. Provide description of awareness/preparedness building exercises (issue of specific work instructions, public announcements on medical check-ins procedures, access to health care center, etc.) for workforce.

(l) Communication and contact with the community

The community may be concerned about the presence of non-local workers, or the risks posed to the community by local workers presence on the project site. Describe risk-based procedures to be followed for communication with local community stakeholders.

Grievance Redress Mechanism

Project-related GRM log needs to include additional column monitoring COVID-19 related complains/reports/grievances. Provide an update on number of COVID-related GRM log entries since last regular report.

(m) COVID-19 REPORTING

Number of COVID-19 cases – confirmed and suspected/under investigation

Provide information on project-related employees who are confirmed or suspected of being infected with COVID-19 virus: number, date of isolation, severity of the case. **No private information should be provided!**

Reporting arrangements

ESIRT requires outbreaks of diseases to be reported. PIU/Contractor should report an outbreak following the guidance in ESIRT for a ‘Serious’ incident. Borrower informed of any concerns or problems associated with providing care to infected workers on project sites, particularly if infection rate is approaching 50% of the workforce.

Confirm, that these reporting requirements are accepted by the relevant/responsible staff within PIU/Contractor’s organizational structure.

Annex M. Grievance Registration Form

Reference No: _____

*Note: you can remain anonymous if you prefer or request not to disclose your identity to the third parties without your consent. In case of anonymous grievances, the decision will be disclosed at the online **Platform***

First Name _____

Last Name _____

- ☐ I wish to raise my grievance anonymously
- ☐ I request not to disclose my identity without my consent
- ☐ Contact Information

Please mark how you wish to be contacted (telephone, e-mail).

☐ By Telephone: _____

☐ By E-mail _____

☐ I will follow up the resolution at the website as I want to remain anonymous

Preferred Language for communication: ☐ Romanian ☐ Russian ☐ Other (indicate)

Description of Incident or Grievance (What happened? Where did it happen? Who did it happen to? What is the result of the problem? Date of Incident/ Grievance)

☐ One-time incident/grievance (date _____)

☐ Happened more than once (how many times? _____)

Signature: _____ Date: _____

Please return

this form to: PIU, Aureliu Casian 180, Stefan cel Mare si Sfânt ave, office 813, MD 2004

Annex N. Grievance/Inquiry Record Form

GRIEVANCE RECORD FORM			
<i>Instructions: This form is to be completed by staff receiving the inquiry or grievance and kept in the Project's file. Attach any supporting documentation/letters as relevant.</i>			
Date Grievance Received:		Name of Staff Completing Form:	
Grievance Received (check <input checked="" type="checkbox"/>): <input type="checkbox"/> MGF/ PFIs <input type="checkbox"/> PIU <input type="checkbox"/> MEI			
Mode of Filing Inquiry or Grievance (check <input checked="" type="checkbox"/>): <input type="checkbox"/> In person <input type="checkbox"/> Telephone <input type="checkbox"/> E-mail <input type="checkbox"/> Phone Text Message <input type="checkbox"/> Website <input type="checkbox"/> Meeting <input type="checkbox"/> Public consultation <input type="checkbox"/> Other _____			
Name of Person Raising Grievance: <i>(information is optional and always treated as confidential)</i> <i>Gender:</i> <input type="checkbox"/> Male <input type="checkbox"/> Female			
Address or contact information for Person Raising Grievance: <i>(information is optional and confidential)</i>			
Location where grievance/problem occurred [write in]			
National:	Regional	Rayon:	City/ Village:
Brief Description of Grievance or Inquiry: (Provide as much detail and facts as possible)			
Category 1	Social Safeguards		
Category 2	Environmental Safeguards		
Category 3	Grievances regarding violations of policies, guidelines and procedures		
Category 4	Grievances regarding contract violations		
Category 5	Grievances regarding the misuse of funds/lack of transparency, or other financial management concerns		
Category 6	Grievances regarding abuse of power/intervention by project or government officials		
Category 7	Grievances regarding staff performance		
Category 8	Reports of force majeure		
Category 9	Grievance about project interventions		
Category 10	Other		
Who should handle and follow up on the grievance:			
Progress in resolving the grievance (e.g. answered, being resolved, settled):			

Annex O. Report on Consultation on the Draft ESMF with Interested Parties

Date: March 21, 2014

Venue: Ministry of Economy, Chisinau

Location/venue	Objective	Invitees	Participants	Summary, conclusions and comments
Chisinau, Ministry of Economy	To introduce the CEP-II project and its components, including EMF and Environmental Guidelines, and solicit feedback	There were not sent personal invitations. The invitation to participate in Consultation was sent electronically to the following institutions: ' Ministry of Environment ' State Ecological Inspectorate ' Ministry of Economy ' Credit Line Directorate (CLD) ' Organization for the Development of Small and Medium Enterprises (ODIMM) ' Moldovan Investment and Export Promotion Organization (MIEPO) ' Institute of Ecology and Geography ' Regional Environmental Center (REC) Moldova (NGO) ' National Environmental Center (NGO)	1. Capcelea A., World Bank 2. Bulimaga C., Institute of Ecology and Geography ASM 3. Mustea M., National Environmental Center 4. Plesco T., Ministry of Environment 5. Petreanu Mariana, State Ecological Inspectorate 6. Suruceanu N., REC-Moldova 7. Neghina S., Ministry of Economy 8. Cebotari E., Ministry of Economy 9. Cantemir R., CLD 10. Jurminski V., CLD 11. Vilcu M., CLD 12. Casian A., PIU 13. Overcenco A., PIU	On the meeting, there were made presentations on: Second Competitiveness Enhancement Project and its Components and Environmental Management Framework for project activities. The attendees actively participated in discussions which were mainly focused on the proposed environmental screening procedures and capability of Financial Intermediaries and Implementing Agencies to perform environmental management and monitoring of sub-projects. After the meeting, on the basis of input from participants as well as received comments on Draft EMP posted two weeks earlier on national public consultation web-portal (www.particip.gov.md) and REC website (www.rec.md), there were made relevant corrections both in the EMF main text and EMF Annexes to better meet stakeholders' concern.

Date: April 30, 2021

Venue: On-line, web-platform

Location/venue	Objective	Invitees	Participants	Summary, conclusions and comments
Web-platform	To introduce the CEP-II AF project and its components, including ESMF and Environmental/Social Guidelines, and solicit feedback	The invitation to participate in Consultation was sent electronically to the following institutions: '		