The Republic of Moldova
Ministry of Economy

SECOND COMPETITIVENESS ENHANCEMENT PROJECT
CEP-II

Environmental Management Framework

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Acronyms

BP	Bank Procedures
DCFTA	Deep and Comprehensive Free Trade Agreement
EA	Environmental Assessment
EG	Environmental Guidelines
EIA	Environmental Impact Assessment
ELV	Emission Limit Values
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EU	European Union
FI	Financial Intermediary
GEF	Global Environmental Facility
GMO	Genetically Modified Organisms
GoM	Government of Moldova
IDA	International Development Association
IEC	Important Environmental Component
IFC	International Finance Corporation
IPM	Integrated Pest Management
LOC	Line of Credit
MAC	Maximum Allowable Concentrations
MDL	Moldovan Lei
ME	Ministry of Environment
MoE	Ministry of Economy
MGF	Matching Grant Facility
MIEPO	Moldovan Investment and Export Promotion Organization
NGO's	Non-governmental Organizations
ODIMM	Organization for the Development of Small and Medium Enterprises
OP	Operational Policy
PFI	Participating Financial Institutions/Intermediaries
PIA	Project Implementing Agency
PIU	Project Implementation Unit
RISP	Rural Investment and Services Project
RM	Republic of Moldova
RSF	Risk Sharing Facility
SEE	State Ecological Expertise
SEI	State Ecological Inspectorate
SEIA	Statement on the Environmental Impact Assessment
SER	Sectorial Environmental Review
SME	Small and Medium Enterprise
TA	Technical Assistance
TOR	Terms of Reference
USA	United States of America
WB	World Bank

Executive Summary

1. ***Project objective***. The project's development objective is to help increase the competitiveness of Moldovan enterprises, in particular small and medium enterprises, by increasing their linkages with markets, improving their ability to access medium to long-term finance, and improving the business enabling environment.

2. ***Project description.*** The project is composed of three components:

(I) *Regulatory Reform Component.* Moldovan Governmental agencies and institutions will benefit from mechanisms that improve the implementation of reforms to improve the business enabling environment. These mechanisms will improve accountability and monitoring of reform strategies that GoM has adopted – including the Business Roadmap, Regulatory Reform Strategy Action Plan, and Competitiveness Strategy, and others as appropriate throughout the life of the project. Select institutions will benefit directly from assistance to implement priority reforms;

(II) *SME Development Component.* The Organization for the Development of Small and Medium Enterprises (ODIMM) and Moldovan Investment and Export Promotion Organization (MIEPO) will benefit directly from activities to improve the targeting, design, delivery mechanisms, and capacity to implement programs to facilitate SME development and exports. The project will focus on the roles that these public institutions should play as providers of public goods and with an aim to overcome market failures. The project will also build in activities to make these gains sustainable after the end of the project, as described in the section on sustainability below. It is expected that 280 enterprises will participate directly in the matching grant facility, and that each enterprise will receive at least two business development services to implement a business improvement project; and

(III) *Access to Finance Component.* Moldovan export oriented private enterprises eligible for financing will benefit directly from funds on-lent through the participating financial intermediaries (PFIs) under the line of credit (LOC). Along the same lines, Moldovan banks eligible to participate as PFIs will benefit directly from access to medium- to long-term funds under the LOC and technical assistance to improve lending methodologies for SME financing.

3. ***Location.*** The matching grants and sub-projects to be supported under the project will be identified and screened during the implementation stage and will be implemented countrywide based on demand for proposed activities.

4. ***Project category.*** In accordance with the Bank's safeguard policies and procedures, including OP/BP/GP 4.01 *Environmental Assessment*, the project relates to the Bank's *FI Category* which is applied to all proposed projects that involve investment of Bank funds through a participating financial intermediary (FI) to be used for sub-projects environmental impacts from which cannot be determined during appraisal of the World Bank project. For a FI operation, the Bank requires that FI screens each proposed sub-project to ensure that sub-project beneficiaries carry out appropriate EA. Before approving a sub-project, the FI verifies (through its own staff, outside experts, or existing public institutions and agencies) that the sub-project meets the environmental requirements set by current national legislation and is consistent with the Bank's OP/BP/GP 4.01. For such projects it is necessary to prepare an *Environmental Management Framework (EMF)* which would specify all rules and procedures for the sub-projects EA.

5. ***Potential environmental impacts.*** The project might support different types of matching grants and sub-projects, including in the area of industrial and agricultural production, and agro-processing which might cause some environmental and social impacts which can be summarized as follows: (a) agricultural production: soil erosion, loss of soil productive capacity, soil compaction, soil pollution, surface and underground water pollution, health and environmental risks associated with agro-chemicals use, loss of biodiversity etc.; (b) agro-processing: contribution to surface water pollution, wastes generation, odor etc.; (c) manufacturing: air pollution, waste waters, hazardous wastes and solid waste generation, labor safety; (d) construction: soil and air pollution; acoustic, aesthetics impacts, etc. Overall all these impacts will be site specific and mostly temporary and can be easily mitigated through good projects design and implementation practices. All grants and sub-projects to be supported under the project will be screened at the initial stage of their EA and in the case some of them may cause significant impacts for which it would be necessary a full EIA (Category A projects) such sub-projects will be not financed under the project. Also the sub-projects located in protected areas, critical habitats or culturally or socially sensitive areas along with subprojects which might have impacts on international waterways will be excluded from the project financing. Most of the sub-projects will fall under the Category B projects for which will be required a simple Environmental Assessment and/or preparing simple Environmental Management Plan. It is also expected that many grants and sub-projects will have insignificant environmental impacts and will fall under the Category C projects for which would be required only environmental due diligence procedure.

6. ***Potential social impacts***. The project will generate a great number of both direct and indirect positive impacts. Direct positive impacts will be generated by increased production, products and goods which would result in creation of new jobs and respectively, more employment and increased income. Indirect positive impacts will relate to overall improving of business environment, increased exports and secured enterprises domestic market position, introduction of advanced technologies and techniques, creating new opportunities for access to foreign markets, enhancement competitiveness of domestic production and products, contribution to poverty reduction and food safety, and improvement of country's socio-economic conditions.

7. ***Triggered WB OPs.*** As the project activities might generate some environmental and social impacts it triggers the WB OP 4.01. The project also potentially might trigger OP 4.09 on *Pest Management* as supporting agricultural activities may require more use of agro-chemicals. At the same time, as all proposed activities are to be implemented within existing agricultural land and settlement boundaries, the project will not have impacts on wildlife and natural habitats and thus OP/BP 4.04 *Natural habitats* is not triggered. It is also expected there will be no impact on physical cultural resources, and therefore OP/BP 4.11 *Physical Cultural Resources* is not triggered. The EMF specifies also private businesses will be eligible to become project beneficiaries under the condition that they have not acquired and/or would not acquire land for the needs of activities to be supported with the project proceeds through a process which involved and/or would involve officially supported expropriation. Additionally, project funds will not support any sub-loans used to invest in a business which would require the involuntary displacement of existing occupants or economic users of any plot of land, regardless of its current ownership, or loss of or damage to assets including standing crops, kiosks, fences and other. The project Operational Manual will define a screening procedure to be filled by PFIs, and the Project Implementing Agency (PIA) will closely monitor the screening procedure, with the support of the Bank task team. With these restrictions in place, the project does not trigger OP/BP 4.12 *Involuntary Resettlement*.

8. ***Environmental Management Framework (EMF).*** In order to address safeguards policy issues the borrower updated the Environmental Management Framework (EMF) prepared for the CEP I project. The EMF outlines environmental assessment procedure, including criteria and responsibilities for matching grants and sub-projects environmental screening, assessment, designing Environmental Management Plans (EMPs), EMPs implementation and monitoring. The document also includes Environmental Guidelines for different types of proposed sub-projects providing analysis of potential impacts and generic mitigation measures to be undertaken for sub-projects in agricultural production, agro-processing and manufacturing sectors at all stages - from identification and selection, through the design and implementation phase, to the monitoring and evaluation of results. Furthermore, the EMF provides a monitoring plan format which considers monitoring indicators, timing, methods, and institutional responsibilities. Lastly, the EMF includes a section describing both measures which will be used to ensure compliance with national laws and WB requirements relating to pesticide purchase and use, and also measures to promote Integrated Pest Management (IPM) approaches and safe pesticide handling and disposal practices to reduce human and environmental exposure.

9. ***EMF disclosure and consultation***. The Project Implementation Unit (PIU) has disseminated the draft summary EMF to the Ministry of Economy, Ministry of Environment, and other relevant ministries for their review and comments, and also, on March DD, 2014, the document was posted on websites of the Ministry of Economy (www.mec.gov.md) for its access to wide public. On March DD, 2014, the PIU has organized a consultation on draft EMF. After the consultation, draft EMF document was revised to consider inputs from consulted parties. On March DD, 2014, the final draft EMF was posted on the website of the Ministry of Economy and submitted to the World Bank for its disclosure in InfoShop.

1. Environmental Assessment Policies, Rules and Procedures

1.1 National Environmental Assessment Regulatory Framework

The national legal basis for environmental protection is fairly comprehensive. It includes a set of environmental laws and regulations and there is a general opinion that this existing body of laws, governmental and ministerial decrees, official rules and standards is a sufficient base for effectively addressing the country's environmental issues. Nevertheless, being under the European choice, Moldova is continuously improving legal frameworks towards approximation with European legislation. Within last years there were adopted a series of new laws such as Law on the National Ecological Network, developed a new version of the Water Law which aims to establish a legal base for implementation of the Water Framework Directive in Moldova; there was approved the new system of Surface Water Quality Standards, which comprises three principal components: a use-base hierarchical (i.e., ranked in order of decreasing water quality) classification of water bodies; list of water pollution parameters to be regulated, consistent with the existing monitoring capacity and pollutants relevant for Moldova; and numerical values of water quality standards for each class of water quality; in conformity with the EU Urban Waste Water Treatment Directive, there was developed and approved by the Government a Regulation on Discharges of Municipal Wastewaters into Natural Watercourses, etc.

1.1.1 Environmental legal framework

This section describes the laws which may have a relevance to environmental management of sub-projects to be supported by the CEP-II.

Law on Environmental Protection (1993). This is a basic law that provides general framework for the environment protection in Moldova and options for sustainable development. The central environmental body shall (art. 16): i) conduct state environmental expertise which is its exclusive area of responsibility and competence; ii) prohibit/or suspend the construction and reconstruction of industrial, agricultural and other activities which exploit natural resources; and likewise to other activities that are in defiance of environmental legislation. State Ecological Expertise should be conducted (art. 21) for: i) construction, extension, reconstruction and modernization of any economic and social activity (administrative and military activities are exemptions) that may cause an impact to the environment. Expertise must be conducted (art. 22), among other activities, for: i) hydro technical installations, dykes, irrigation and drainage systems; ii) establishment of vineyards and orchards in zones with water protection schemes; iii) production, sale and use of pesticides and other toxic substances; iv) any other activity that may have a negative effect on environmental quality.

Law on Ecological Expertise and Environment Impact Assessment (1996). The law determines goals, objectives and principles of Ecological Expertise and Environmental Impact Assessment, as well as fundamentals of both procedures. The Law describes in details Environmental Impact Assessment procedures, demands the reporting, rules of complying and submission of documentation on Environmental Impact Assessment, public involvement, revision of Environmental Impact Assessment documentation, rules for conducting of the SEE. The State

Ecological Expertise is a part of a complex of activities toward environment protection through which the potential impacts on environment from planned economic activity, compliance of parameters of these activities with legislation and normative acts, norms and standards in force are identified and mitigated. According to the Law, project documentation for the objects that may adversely affect environment is a subject of state ecological expertise which in turn determines whether it complies with environmental protection requirements. Decision on ecological expertise can be considered as the basis for approval or refusal of the project. Ecological expertise is conducted prior to making decision on planned economic activities, and is mandatory for all economic activities which may have likely negative impact on environment regardless their destination, ownership, investments, location, source of financing etc. In case the objects can affect severely environment, their planning documentation is a subject of Environmental Impact Assessment (EIA) to be conducted prior to Ecological Expertise. The EIA/SEE documents shall also include, i) a comparison of alternatives and justification for the selected alternative, ii) mitigation measures and conditions to avoid or minimize impacts. These impacts have to be considered during all stages of the project including construction, operation and decommissioning. Public ecological expertise may be organized and conducted on the basis on initiative of officially registered public organizations/ associations. However, until approval from Central Environmental Authority, the results of the public ecological expertise are considered as ones having a recommendation character.

Land Code (1991). The Land Code establishes relations and rights of land ownership and the basic framework of land use. Art. 5 states that land conservation should be a priority while implementing any kind of activities. Art. 23 is particularly important because it stipulates cases of termination of land rights, including use of the land in ways that result in soil degradation, chemical and other pollution, deterioration and destruction of ecosystems or their components. The obligations of the land owners (art. 29) are: use of land to conform to its intended and planned use, observe conditions of land exploitation, to ensure structure of crop rotation to conform to good agricultural practices, to apply chemical inputs only to recommended levels and to provide protection and improvement of soil fertility.

Forest Code (1997). The Law aims to regulate housekeeping of the forest fund through its rational use and regeneration, forest defense and protection, maintenance, conservation and improvement of forest biodiversity towards to ensure current and future needs of society for forest resources.

Code on Mineral Resources (2009). This new Code adopted has replaced the old Code on mineral resources as of 1993. It provides improved regulatory frameworks for mineral resources management to ensure scientifically substantiated, rational and complex use of mineral resources to ensure their long-term availability for the national economy, and establishes responsibilities physical and juridical persons in the field.

Law on Water Protection Strips along the Rivers and Water Bodies (1995). The law establishes the rules for creation of water protection zones and strips along rivers and water bodies, the regime of their use and protection. The law determines: (i) dimension of protected zones and strips; (ii) water protection regime (permitted economic activities) within the water protection strips, etc. According to the Law, use of pesticides is restricted on the strip of 300 m width along the river bank; ii) siting of livestock farms, septic tanks and solid waste from livestock farms, location of technical services stations, machinery and transport wash, location of municipal and industrial waste disposals, and irrigation by sewage is to be controlled with respect to distance from river bank.

Law on Air Protection (1997). The main objectives of the Law are maintenance of clean air, improvement of air quality, prevention and mitigation of harmful physical, chemical, biological and radiological impacts on air quality, and accordingly protection of human health and environment.

Law on Natural Resources (1997). This law provides the basic principles of natural resource management and use. The legal act includes, among others, provisions for "natural resource use pay" and "pollution pay" principles and other economic mechanisms aimed at improving of economic entities' production technology to minimize utilization of natural resources and enhance their protection and encouraging environmentally friendly economic activities.

The Law on Taxes for Pollution of the Environment (1998). This Law refers to the penalties for the discharge of pollutants into the environment. Art. 9(1) describes the penalty charges for pollutants released from waste water discharges both to water bodies and effluents into sewerage systems where such discharges exceed established limits. Part (2) indicates that penalties for pollutants released into sewage facilities and on filtration fields are to be imposed on the base of the total volume of water allocation. Part (3) describes the penalty for release of water from fish ponds in the case of excessive volume of pollutants. Annex 6 of the law provides norm for counting of fees for pollutants released from cattle, pig and poultry farms into septic tanks; annex 7 - for collection and storage of other solid wastes, including toxic.

Law on Licensing of Certain Kinds of Activities (2001). The Law aims at ensuring of the state control over compliance with requirements and conditions to be adhered while fulfilling certain activities. It determines legal, organizational and economic basis for certain kinds of activities and establishes kinds of activities which require permits. The List of activates liable to licensing includes: ecological control, exploitation of deposits of mineral resources, import and sale of chemical and biological means of plant protection; collection, storage and processing of used accumulator batteries, and design of all kinds of buildings and reconstruction works, capital repairs, etc.

Law on Animal Kingdom (1995). The main purpose of the law is creating conditions for effective protection and rational use of fauna resources. The law determines that design and construction of any facility should be implemented only if animal protection measures (habitat, reproduction, and migration ways) are undertaken. Art. 13 stipulates that sites of construction of enterprises, facilities, installations and other objects are co-ordinated with Ministry of Environment, with local public authorities and other agencies; Art. 14: while carrying out of agricultural and construction works, exploitation of transport and implementing of other activities physical and juridical persons are obliged to undertake measures toward prevention of animals losses.

The Law on Plant Protection (1999). This law, among others, establishes (art. 14) the requirement of those responsible for the storage, transportation, selling and use of pesticides used for plant protection to observe the stated rules and norms for such. As well, the law bars environmental pollution and other negative impacts that such may have on man and animals.

Law on Regime of Harmful Products and Substances (1997). The Law establishes role and responsibilities of the Government and other central and local authorities in relation to harmful products and substances, and describes the regime of harmful products and substances (licensing, production, storing, transportation, use, registration, neutralization, import and export).

Law on Production and Consumption Wastes (1997). The Law provides basic principles in the field of waste management generated during the process of production and consumption, and aims to reduce wastes and prevent environmental pollution. The Law art. 17(2) stipulates that

construction and put into operation new and reconstructed enterprises and other objects not provided with equipment and technologies ensuring safe use, treatment and removal of wastes and not provided by a positive decision from ecological and sanitary-epidemiological expert services are prohibited. Art. 18 describes the requirements regarding wastes disposals, i.e., disposal and storage of wastes is executing by means not affecting the human health and environment.

Law on the Fund for Natural Areas Protected by State (1998). This law establishes the list of objects/areas under state protection, protection regime and buffer zones around protection objects/areas.

Law on the Ecological Network (2007). The Law establishes a legal framework for creation and maintenance of the National Ecological Network as an integral part of Pan-European Ecological Network.

Law on Quality in Construction (1996). This law determines juridical, technical, economic and institutional aspects related to the construction activities related to the quality in construction. The Law stipulates that the constructions next requirements should be ensured: resistance and stability; fire, hygiene and environmentally safety, etc. Art. 13: construction, modernisation, strengthening, repair/ renovation are implemented only in accordance with project documentation worked out by physical and juridical persons authorised for such kinds of works and verified by authorised specialists in the field; Art 14**:** design and construction of buildings is implemented by physical and juridical persons licensed for activity in the field.

The Law on Grounds of Town-planning and Territorial Development (1996). This law relates to planning, location and construction of buildings, including any modifications to buildings. Art. 6(3) states that documentation for town-planning and territorial development establishes location of land zones and rules for their use. Town-planning certificates and permits for construction are issued on the basis of this documentation. For construction purposes based on approved documentation, art. 52 stipulates that local public administration shall provide permits for operations and also for any changes of operation location. Assessment of potential environmental impacts of above activities and developments, and the provision of ecological expertise is to be conducted in accordance with the Law on Ecological Expertise and Environmental Impact Assessment.

Law on fish reserve, fishing and fish-farming (2006). Most of national natural water streams, lakes and reservoirs are classified as fish-water. It is prohibited by the law: (i) discharge to the fish water of un-treated waste water, (ii) use of fertilizers, pesticides and other chemicals on the water bodies and at the banks (300 m), (iii) lowering of water level or use water for agricultural purposes without permit issued by Fishery Service under the State Ecological Inspectorate, (iv) abstract water without fish protection installations, etc.

Law on Safety of Dangerous Industrial Objects (2000). The Law establishes legal, economic and social aspects of safety operation of dangerous objects/ enterprises and focuses on prevention of industrial accidents, stoppage actions, minimisation and liquidation of accident consequences, and protection of environment and population. Art. 9: technical installations/ devices used at dangerous objects/ enterprises shall be a subject of compulsory certification on compliance with industrial safety requirements in accordance with established order (enclosure No 1 to the Law explains that as dangerous industrial objects are considered those technical installations disruption of which can cause an accident).

Law on Secondary Material Resources (1996). The Law determines basic juridical, economic and institutional requirements related to the secondary material resources and aims at ensuring of rational use of natural resources. The economic entities are required (i) to use the environmentally clean production facilities, (ii) to make an inventory and to register industrial and domestic wastes, and submit reports to the statistical offices, (iii) re-utilize own wastes as much as possible, but if not possible, to transport wastes to special organizations dealing with collection or re-utilization of wastes. Art. 9: while designing, constructing and reconstructing of all enterprises the following must be ensured: use of low-wasting, non-wasting and ecologically clean technologies; development of waste treatment facilities attached to enterprises.

1.1.2 International conventions ratified by RM

Moldova is a party to about 26 International Environmental Conventions. Among them are the following:

- Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, 1991), ratified in 1993;
- Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979), ratified in 1993;
- Agreement on the Conservation of African-Eurasian Migratory Species (Hague, 1995), ratified in 2000;
- Convention on Migratory Species of Wild Animals (Bonn,1979), ratified in 2000;
- Convention on Wetlands of International Importance Especially Waterfowl Habitat (Ramsar, 1971), ratified in 1999;
- Convention on Transboundary Effects of Industrial Accidents (Helsinki, 1992); ratified in 1993;
- Convention on the Protection of Transboundary Watercourses and International Lakes (Helsinki, 1992), ratified in 1993;
- Stockholm Convention on Persistent Organic Pollutants (Stockholm, 2001), ratified in 2004;
- Convention on Cooperation for the Protection and Sustainable Development of the Danube River (Sofia, 1994), ratified in 1999;
- Convention on Biological Diversity (Rio de Janeiro, 1992), ratified in 1993;
- United Nations Framework Convention on Climate Change (Rio de Janeiro, 1992), ratified in 1995;
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington, 1973);
- European Landscape Convention (Florence, 2000), ratified in 2001;
- The United Nations Convention to Combat Desertification (Paris, 1994), ratified in 1999;
- Convention on Plant Protection Service (Rotterdam, 1998), ratified in 2004;
- Cartagena Protocol on the Biosafety to the Convention on Biological Diversity, ratified in 2003;
- Convention on Long-Range Transboundary Air Pollution (Geneva, 1979), ratified in 1995;
- Convention on Access to Information, Public Participation in Decision-Making Process and Access to Justice in Environment (Aarhus, 1998), ratified in 1999.

1.1.3 Environmental Impact Assessment by-laws

Regulation on Environmental Impact Assessment (2000). The Regulation is included as an Annex to the Law on Ecological Expertise and Environmental Impact Assessment. It establishes the goal of preparing of documentation on Environmental Impact Assessment (EIA), its procedure, coordination and approval, and includes the List of objects and types of activities for which EIA prior to their design is compulsory is compulsory. EIA is carried out to determine the requisite measures to prevent adverse ecological impacts due to realization of certain planned objects and types of activities. The Regulation describes the requirements for documentation on EIA (materials in which the direct and indirect impacts of planned objects on air, water, soil, landscape, protected areas, fauna, flora, natural resources, cultural and historic monuments, socio-economic situation are establishing, describing and evaluating; comparison of alternative solutions and substantiation of the best one; suggested mitigation activities (on the basis of developed documentation on EIA, the client designs a Statement on Environmental Impact Assessment in which all materials, calculations and researches are presented and systematized), EIA content (title of the project; character of activity; location; substantiation for location;

project duration; technical and technological characteristics of the project; suggested technical solutions; project cost; localities affected by projects; information of direct impacts on environment (water, soil, etc.); land to be occupied by project; water abstraction; water use, water source; sources of raw materials, transport and other infrastructure, emissions to air, wastes and their utilization, etc.); order of elaboration and submission documentation on EIA, state ecological expertise of EIA documentation, decision on a state ecological expertise of EIA documentation, etc.

Instruction on Order of Organization and Conducting of the State Ecological Expertise (2002). The State Ecological Expertise (SEE) is applied for any new construction, its modernization and up-grading. All design documents should be presented to the State Ecological Expertise units (ME for major projects, headquarters of the State Ecological Inspection and rayonal Ecological Inspectorates). Technical solutions, reflected in the submitted for SEE technical documentation have to be sufficiently substantiated in relation to reduction/mitigation of impact on environment. The instruction is accompanied by a series of annexes, which: (i) describe in details requirements for project documentation submitted to SEE; (ii) nominate subdivisions of ME responsible for SEE different types and scales of projects; (iii) establish requirements for every chapter or volume of project documentation, etc.

Regulation on conducting Ecological Audit of Enterprises (1998). The regulation establishes that Ecological Audit aims at controlling compliance of the enterprises activities with the requirements stipulated in the Law on Environment Protection, Law on Sanitary-Epidemiological Protection of the Population and other environmental protection regulatory documents.

General Regulations on Elaboration and Mode of Submission of Declaration on Industrial Security (2000). The Regulation establishes rules on elaboration of and requirements to be adhered while presenting of it to the Department of Standardization and Metrology, which in conformity with the law on hazardous industrial objects security exercises the normative regulation in industrial security.

1.1.4 Environmental Impact Assessment Procedure

In Moldova, the Environmental Impact Assessment (EIA) procedure was established by the Law on Ecological Expertise and Environmental Impact Assessment (1996). The EIA procedures are applicable to complex and potentially dangerous (to the environment) projects which could lead to significant impacts and aim to prevent and mitigate impacts even on the projects' design stage. The EIA should be conducted at an early stage of the project in case new construction, upgrading, reconstruction, modernization, production profile changes, conservation or liquidation of existing enterprises or new development planning is expected to be implemented.

1.1.4.1 Project Environmental Screening. Following national environmental approval procedures, all projects may be conventionally divided into three main categories:

First category - projects which may have significant impacts on the environment (see the list of such projects below). They require a full Environmental Impact Assessment before designing and can be further developed (detailed engineering design) with a positive approval of the EIA findings by the State Ecological Expertise (SEE). The projects of this category mainly corresponds to WB Category A projects as well as partly, to Category B projects, e.g., electrical transmission, nature protection projects, some watershed projects (e.g., protection strips along river and water bodies), some rural water supply projects (for grouped water intakes with 1

thousand m^3/day and more for underground water intake and 10 thousand m^3 per day for surface water intake), etc.

Second category - projects not listed in the list of first category projects, which may have less significant impact on environment. They require ecological substantiation of project activities. Such substantiation is described in a special Environmental Chapter of the project documentation, which has to contain information on potentially affected environment as well as outline main potential environmental impacts and mitigation measures. This Chapter has to be included in the project design documentation and respectively, to be passed through the State Ecological Expertise before project implementation – this Category mainly corresponds to WB Category B projects.

Third category - the rest of projects which are expected to have minor impacts on environment and therefore do not need to be passed through the formal procedures of EIA and SEE. This Category fully corresponds to WB Category C projects.

According to the Law on Ecological Expertise and Environmental Impact Assessment (1996), project documentation for the projects that may adversely affect environment is a subject of a *state ecological expertise.* The main goal of the SEE is to determine whether the project documentation complies with environmental protection requirements and to check whether all environmental standards/ principles are adhered, and the environmental protection measures are addressed. Ecological Expertise should be conducted prior making decision on planned economic activity and is compulsory for project and planning documentation with regard to planned economic objects and activities that affect or may affect environmental conditions and/or envisage use of natural resources, regardless destination, placement, type of ownership and subordination of these objects, the amount of capital investments, source of funding and method of execution of construction works.

The decision of the ecological expertise is the basis for further approval or refusal of the project documentation. In the case of projects which may severely affect the environment (specified in the relevant list attached to the Law on SEE and EIA), their documentation is a subject of EIA to be conducted prior to Ecological Expertise. The purpose of the EIA is to identify impacts effects that these projects may have on the environment and to provide solutions to mitigate any significant effects that could occur as a result of the project implementation.

1.1.4.2 Projects that require full EIA. Per the Law on SEE and EIA (1996), a full EIA followed by the compulsory State Ecological Expertise must be conducted for all activities and objects which: may change natural water regimes and provoke soil salinization, relate to crop cultivation with increased risk of pesticide use, are to be situated in zones with water protection regime, produce releases of harmful substances and materials, e.g. use of pesticides, cement production including those that use asbestos in technological processes, and many other activities that may have a negative effect on the quality of environment, etc. The List of activities requiring a full EIA includes the following types of projects:

1. Thermoelectric stations, thermal industrial and heating stations with the capacity of 300 MW and more;
2. Mechanical enterprises and car construction enterprises with high capacity foundries – 10 thousand tons of cast iron, iron per year and more; 1 thousand tons of non-ferrous metals per year and more;
3. Metallurgical enterprises with a production capacity of 500 thousand tons and more of rolled metal per year;
4. Enterprises for the production of cement and slate, including those using asbestos in the technological processes, stationary asphalt-concrete plants;
5. Chemical and oil-chemical enterprises, secondary processing of paper and cellulose;
6. Pharmaceutical and ether-oil production enterprises;
7. Construction of highways, roads arranged for high speed, long-distance railways, airports with the length of landing strip of 2,100 m and more;

8. Complicated hydro-technical constructions (ports, large dams and water reservoirs);
9. Main high pressure oil and gas pipelines;
10. Petroleum storage depots;
11. Sugar refinery and butter-fat factories;
12. Dairies and meat processing enterprises;
13. Canneries with a production capacity of 100 million conventional cans per year and more, and large big storage/pre-processing units;
14. Animal agro-industrial complexes for cattle, pigs, sheep and poultry;
15. Grouped water intakes for enterprises, urban and rural localities with the debit: 1 thousand m^3/day and more for underground water intake, 10 thousand m^3/day for surface water intake;
16. Industrial and municipal waste water treatment plants with the capacity of 10 thousand m^2 per day and above;
17. Industrial orchards and vineyards with an area of 500 ha and more;
18. Irrigation and drainage systems with areas of 1000 ha and 100 h and more, respectively;
19. Greenhouse complexes with areas of 24 ha and more;
20. Waste treatment and waste incineration plants;
21. Installations and polygons for the treatment, incineration and neutralization of industrial wastes, including of toxic, drugs and radioactive ones;
22. Any type of construction activity in riverbeds, in protection strips along rivers and water bodies;
23. Open mining of: a) limestone, with an extraction capacity of 100 thousand m^3/year and more; and (b) sand, gravel, clay, gypsum, with an extraction capacity of 100 thousand m3/year and more;
24. Exploration and development of gas- and oilfields;
25. Underground extraction of limestone;
26. Military polygons and bases;
27. Wineries and beverages, enterprises for the production of sparkling wines, cognacs, liquors, vodka and of other alcoholic products, with a production capacity of 100 thousand deciliters and more per year;
28. Lines of electric-power transmission with the voltage of 330 kV and more;
29. Radio-electronic and electro-technical enterprises with a production area of 2 thousand m^2 and more.
30. Tanneries, including enterprises for the primary processing of raw skins;
31. Sawmilling and furniture manufacturing enterprises with a production area of 4 thousand m^2 and more;
32. Enterprises of the textile, clothing and shoemaking manufacturing with dyeing processing, and production of synthetic raw materials and polymers.

The Ministry of Environment (ME) may also require a full EIA for other types and scales of projects on the case-by-case screening, but criteria and procedures for that are not specifically stipulated by the Law. In conformity with the Law, the EIA should be conducted at an early stage of the project, before designing stage in conformity with approved methodology, structure of the report and other documentation requirements. The EIA can be conducted by intuitions which hold a special license issued by the ME, based on their qualification.

Based on the full EIA study should be prepared a Statement on the EIA which is subject to the ME review and approval. The SEIA is also a subject of public consultation. The procedure for the SEIA disclosure and consultation established by the Law on SEE and EIA is the following: the beneficiary submits the SEIA to the competent ministries and departments, in conformity with a profile of the object or activities, and to concerned local public authorities. Within next 5 days, local public authorities have to disseminate through mass media the information about the place and time one can get acquainted with the SEIE, obtain a copy of SEIA, public ecological expertise and public debates. The public access to the SEIA shall be open within 30 days. During this term, the objections on the respective documents may be submitted in written to the person specially appointed by the local public authorities. Within next 14 days after a 30-day public access to the SEIA, concerned local public authorities shall submit the objections formulated within the public debates on the SEIA as well as their own objections to the beneficiary, and to copy these to the central environment authorities The ministries and departments shall submit to the beneficiary, within 50 days from the receipt of the SEIA, their own objections, and also to copy these to the central environment authority. Should the beneficiary and the central environment authority not receive objections on the SEIA within 50 days it shall be considered that such do not exist.

Corrected SEIA and other EIA documentations (additions, inputs from public consultation, results of specific research, when needed, tables, maps, models, etc.) should be presented to ME for review by the State Ecological Expertise (SEE).

The main objectives of Ecological Expertise of planned objects' documentation are maintenance of ecological balance, conservation of genetic fund and biological diversity, creation of favorable conditions for living, etc. The basic principles of Ecological Expertise are comprehensive examination of technical, ecological, social and economic parameters presented in documentation on planned economic activity with considering of regional characteristics, ecosystem conditions and their resistance to the planned impact, perspective of socio-economic development of the region, etc.

The following new projects, programs, plans and schemes are subject of the State Ecological Expertise *(*cite on the *Instruction on Order of Organization and Conducting of the State Ecological Expertise, 2002)*:

a) draft legislative acts and other draft legal acts, instructions, norms and methodologies, regulations and standards referring to the state of the environment and/or regulating potentially dangerous for the environment activities, the use of natural resources and environment protection;
b) draft international conventions, draft concession contracts presuming the use of natural resources;
c) new projects, programs, plans and charts regarding:
- the economic and social development of the Republic of Moldova, of certain regions, districts, municipalities, villages;
- nature protection in the country as a whole and by separate territories;
- reconstruction of municipalities, cities, villages;
- supply of heat, water, gases, electric power;
- construction of sewerage systems of localities;
- town planning and land arrangement in urban and rural localities;
- construction, extension, reconstruction, re-equipment, modernization and readjustment, conservation, demolition or liquidation of all economic and social objects liable to affect the environment as well as of those that can affect the environmental state in neighboring countries, determined by the Espoo Convention;
- construction of roads, railways, river communication, reconstruction of riverbeds, hydro-technical constructions, irrigation and draining systems, construction of systems to prevent soil erosion and salinization;
- mineral resources extraction and exploitation, including in areas with water protection regime;
- production and destruction of pesticides and of other toxic substances;
- placement and arrangement of platforms for industrial, domestic, agricultural wastes and toxic residues, construction or placement of installations for processing, neutralizing or destroying such wastes and residues;
- other activities that can affect the state of the environment.

All EIA conclusions, including list of mitigation measures and environmental management plan should be outlined in the chapter on "Environment Protection" of the Design Document. The SEE can be conducted either by the central office of the ME (Division for Pollution Reduction Prevention), or by the State Ecological Inspectorate headquarter, or Territorial Ecological Agency in dependence on scale of the project and significance of potential environmental impacts.

Above procedure mainly corresponds to a full Environmental Impact Assessment required by the World Bank for Category A projects.

According to the national procedure, for the enterprises which exists already and are operating but which plan to be reconstructed, modernized, enlarged, etc**.** an EIA should be conducted only for those parts which are going to be under reconstruction, modernization, enlargement, etc.

The list of objects, buildings and installations which has to be presented to the relevant sub-divisions of the Ministry of Environment for conducting of the State Ecological Expertise is presented the *Table 1* below.

Table 1. List of objects, buildings, installations documentation which has to be presented to the relevant sub-divisions of the Ministry of Environment

№	Title of branch and object	ME Divisions		
		Division for Pollution Reduction	Direction of the Ecological Expertise and Environmental Authorisation of the SEI	Territorial Ecological Agencies and Inspections of the SEI
A	**OBJECTS OF THE SOCIO-CULTURAL AND COMMUNAL DISTINATION**			**+**
B	**OBJECTS OF THE INDUSTRIAL, COMMUNAL, TRANSPORTATION, ENERGY, COMMUNICATION, WAREHOUSE AND OTHER**			
I	**Industrial destination:**			
1	Enterprises of metallurgical, chemical, engineering, electro-technical industries		+	
2	Enterprises of forestry, woodworking, light, food, meet and dairy and construction materials industries		+	
3	Agricultural objects		+	
a	Cattle and pig farms, poultries		+	
b	Cattle and pig farms		+	
c	Processing: - in towns, cities and district centers - in rural localities		+ 	 +
d	Oil and flour mills in rural areas			+
4	Irrigation and other water management objects		+	
a	Projects, construction working projects, construction, re-construction, enlargement of irrigation systems, hydro-technical installations, etc.		+	
b	Projects: fish protection installation, sedimantation and flood prevention ponds as well as projects to prevent dangerous geological processes		+ +	
5	Open pits and mines for extraction of mineral resources		+	
6	Exploration and exploitation of gas- and oilfields		+	
7	Documentation on other objects not listed in items A & B		+	
II	**Objects of communal destination**			
1	Water intakes and waste water treatment plants, sewage		+	
2	Water supply systems; industrial, municipal and storm sewage, heating, sanitary treatment, transport: - on the national level - towns, cities, district centers, rural localities	 +	 +	
3	Municipal solid waste incineration plants, polygons on treatment and disposal of industrail, municipal and toxic wastes: - for municipalities Chisinau, Balti, Tiraspol, Bender - for other localities.	 +	 +	
III	**Warehouses of any destination, objects of communication, transportation service, ports, tunnels**		**+**	
IV	**Energy objects**			
1	Power station 330/110/35 kV, district, industrial and heating houses		+	
2	Other energy enterprises, objects and installations			+
C	**LINEAR OBJECTS AND FACILITIES**			
I	**Transport, energy, communication**			
1	River bridges, crossroads in urban localities, international roads		+	
2	Roads of national and inter-district significance, etc.		+	
3	Roads in rural localities and between them		+	
4	Oil filling stations (regardless their location)		+	
5	Sites for open parking and garages for cars: - with technical service - without technical services		 +	 +
6	High-voltage power lines:			
a	110 kV and more	+		
б	35 kV and less			+
7	Heating networks:			
a	From municipal and district heating houses		+	
b	From local heating houses		+	
8	Communication lines on pylons and underground:			
a	Main (magisterial)		+	
b	Between localities and inside them			+
9	Gas pipelines:			
a	Main of high and medium pressure, international and inter-district, gas		+	

№	Title of branch and object	ME Divisions		
		Division for Pollution Reduction	Direction of the Ecological Expertise and Environmental Authorisation of the SEI	Territorial Ecological Agencies and Inspections of the SEI
	distribution stations			
b	Gas pipelines from gas distribution points to customers in rural and urban areas		+	
10	Water supply and waste water collection systems in bounds of localities (without installations)			+
11	Oil pipelines		+	
D	**DOCUMENTATION ON TOWN BOUILDING AND URBAN DEVELOPMENT**			
V	**Schemes of a complex use and protection of water resources and river basins**	**+**		
VI	**Drafts of the envioronmental laws and other regulartory documants, including standards as well as those regarding environmental consitions and/ or regulating potentially hazardous for environment activities, use of natural resources and enviornmental protection**	**+**		
VII	**Drafts of international Conventions and concession agreements presuming use of natural resources**	**+**		
IX	**Projects of the national and special importance as well as ones developing by foreign economic agents**	**+**		
X	**Documentation on Environmental Impact Assessment**	**+**		
XI	**Other documents and materials not listed in items A, B, C & D**		**+**	

Remarks:
1. Volume, content and composition of the project documentation on construction, re-construction, technical modernisation, re-profiling of enterprise should correspond to requirements of normative, methodical, instruction and directive documents and environmental legislation in force.
2. Ecological Expertise of the projects, materials and documents related to development and adoption of new technologies, equipment and materials, including foreign ones, is being implemented by the Institute of Ecology and Geography of the Academy of Sciences at the initial stage of the elaboration of project documentation.

According to the Law, not later than in 10 days after making a decision (positive or negative) on Environment Impact Assessment documentation, the central environmental authority through the mass media, in an obligatory order inform the public about results of the ecological expertise on Environmental Impact Assessment.

Public consultations for the projects which require a full EIA (listed above) are compulsory at the initial stage of the project before conducting EIA (at the scoping stage) and on a later stage, when the Statement on Environmental Impact Assessment is disclosed for public prior to reviewing of the final (corrected) documentation by the SEE and thus, the existing national public consultation procedure for first category fully complies with the Bank's one (for Category A projects). In relation to projects which are not listed in the Law, public consultation is not compulsory, the issue which doesn't comply with the WB requirements concerning second category projects (WB Category B projects).

Based on the results of the State Ecological Expertise of the Environmental Impact Assessment documentation and consideration of results of public consultations, the opinion letter is being complied. A positive opinion letter/ decision of SEE on the Environmental Impact Assessment documentation serves as official basis to proceed with further project's design.

Obviously, the EIA procedure is a complex one and consists of subsequent steps of documentation submission and approval. The national EIA procedure is illustrated in the *Figure* below.

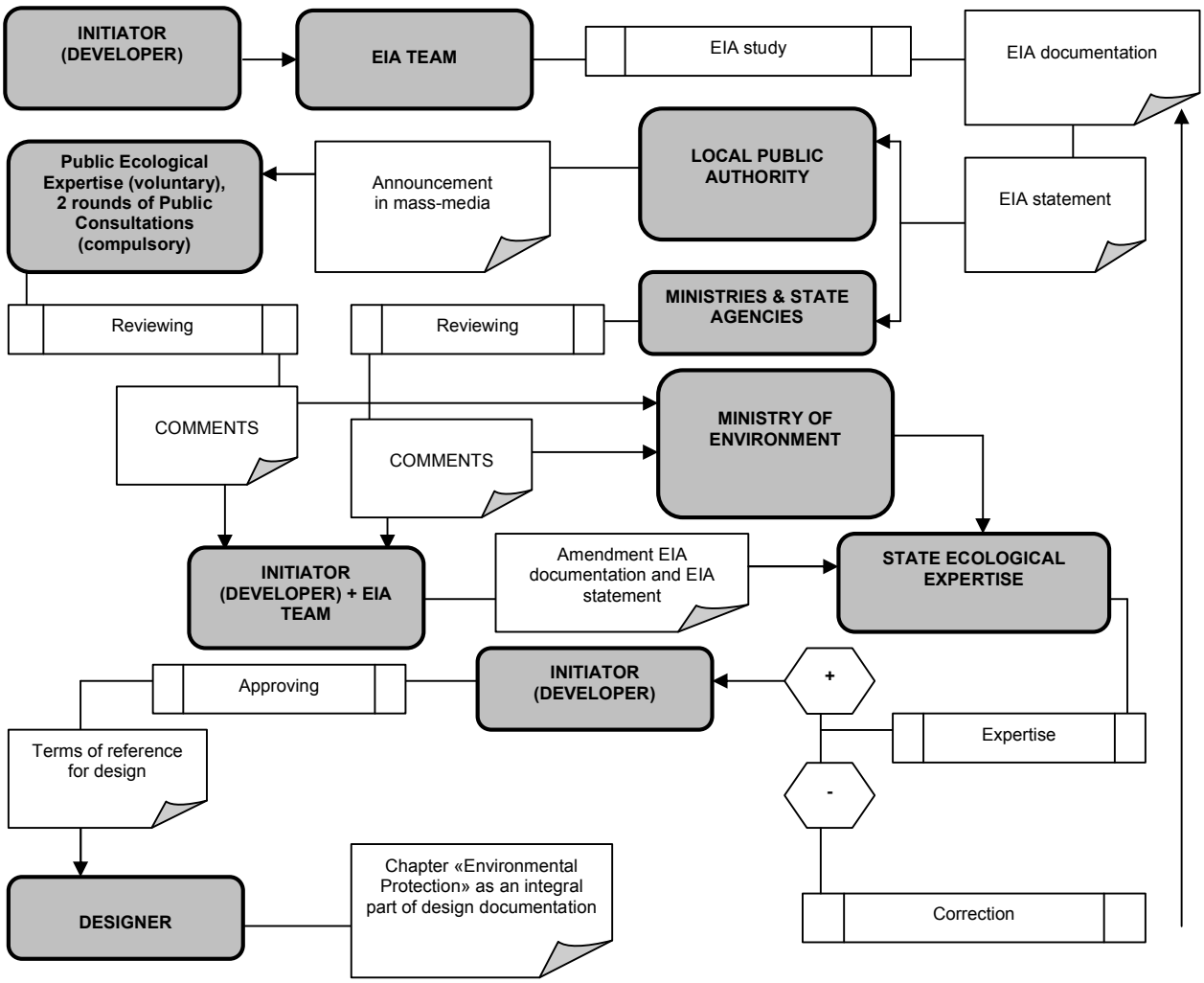

Figure. The national EIA procedure
(design by R. Melian, Acvaproject Design Institute, Moldova)

The developer (initiator of the planned activity) is responsible for organization of EIA study, conducting of consultations, presentation of EIA documentation and SEIA to the SEE, including its financing.

1.1.4.3 Projects that require SEE of design documentation. All projects, which may have negative impact to environment, but not listed in Regulation on Environmental Impact Assessment (second category), will require SEE before construction. The SEE procedures are usually applied after feasibility and engineering design stages. The design documentation for these projects usually linked with construction, reconstruction and enlargement is being developed in conformity with a technical documentation.

Sections “Environment Protection” and “Environment Protection during Construction” in the project documentation should be developed only by specialists in the fields. Technical solutions, reflected in the submitted for SEE technical documentation have to be sufficiently substantiated in relation to mitigation of impact on environment.

1.1.4.4 Projects that not require EIA and SEE of the design documentation. Projects that do not need an EIA study and/or SEE of design documentation normally relate to activities when no (re)construction takes place, e.g., purchase of machinery for crop cultivation, small-scale horticulture and viticulture, beekeeping, agro-mechanization services, woodworking,

infrastructure maintenance projects, etc. In these cases for project approvals the following steps are to be followed:

Step 1. Sub-project applicant presents a project description (location and intention) to relevant local (rayonal or municipal) authorities where it is going to be located to get its approval to proceed.

> *Note:* It relates to cases when there should be a new business activity to be registered or authorized, or new building, or/and new technological device or process, or extension of buildings/devices, or new placing of activity, or water use in technology.

Step 2. Applicant submits the sub-project business plan to the district authority (often, in order to review the business plan, a commission is being established, and one member of the commission should be a representative of environmental authority) to receive its approval. The commission determines whether an EIA is required. If the commission disagrees on approval of the plan, the applicant may have to provide additional information and/or the commission may request input from other interested parties.

> *Notes:*
> a) If it is confirmed that no EIA is required (as per list provided in the Instruction on the Order of Organization and Implementation of the State Ecological Expertise) the applicant can proceed with the implementation of sub-project in case he/she received all other needed approval and permits.
> b) If the commission requires some EIA, then the applicant shall hire an authorized body to conduct the EIA on his/her behalf.

Step 3. Once the EIA is conducted, the applicant submits it the central or local (as per Instruction's guidance) environmental authorities for EIA approval. The EIA is submitted to the Division of Ecological Expertise and Environmental Authorizations for its review and comments. Comments may be followed by the: i) approval, ii) approval under certain condition/conditions to be met, or iii) outright rejection of EIA, and hence, the sub-project.

Step 4. Upon approval from environmental authority and obtaining permits issued by all concern institutions (the officers of entities which applicant visit to get an approval determine what kind of special permits on maximum admissible discharges of wastewater, maximum admissible emissions to air - both are calculated for each particular case; water use; construction certificate as well as license on other than water natural resources use should be obtained from specialized institutions), the sub-project implementation is allowed to commence.

> *Note:* The institutions issued relevant permits might be: State Ecological Inspectorate (wastewater discharge volumes, pollutants in effluent and emissions to air), State Agency for Geology and Mineral Resources (AGeoM) (use of underground water resources), Sate Agency "Apele Moldovei (use of surface water resources), local public authorities/ mayoralties (construction certificates), etc.

1.2 Country's Environmental Management Institutional System

1.2.1 Central Public Authorities

Ministry of the Environment (ME). This is the central authority, responsible for the development and promotion of the state policy in the field of environment and natural resources. It performs: state control over the natural resources use; coordination and control over the implementation of environmental laws and policies; initiating and drafting laws and regulations and issuing relevant instructions/ decisions; issuing permits on natural resources uses and licenses for polluting emissions; elaboration, approval and introduction of environmental

standards and normative documents in the field of its competence; environmental monitoring; imposing economic sanctions in case of violations environmental legislation; supervises territorial development and its infrastructure, town-planning, architecture, industry of construction materials and introduction of new techniques and technologies in the sphere of its competence; drinking water supply and waste water treatment in urban areas, etc. The following institutions sub-ordinate to the Ministry: State Ecological Inspectorate; State Hydro-Meteorological Service, and the State Agency for Geology (AGeoM).

State Ecological Inspectorate (SEI).The SEI is an environmental protection regulatory and enforcement agency which performs the state control over the rational use and protection/conservation of the natural resources. Its role is to control implementation of environmental legislation. The SEI through its country wide network of Territorial Agencies and Rayonal Inspections monitors industrial facilities which generate impacts on environment. The SEI issues permits on use of natural resources and environmental pollution in admissible limits; supervises the level of respecting ecological norms and requirements, instructions, recommendations, norms on use of natural resources, dangerous products and substances, and wastes; evaluates environmental impact assessment applications for new developments; provides ecological expertise; regulates and establishes Emission Limit Values (ELVs) and Maximum Allowable Concentrations (MACs) and regulates the emission of dangerous substances into the environment as well as the storage limits of industrial, domestic, hazardous and other wastes; performs environmental pollution monitoring; carries out enforcement of the permits by inspection visits, monitors, and levies fines in cases of non-compliance, initiates legal processing, ceases the activity in case of non-compliance with environmental protection requirements, etc.

State Hydrometeorological Service (SHS). Through the Monitoring Centre on Environmental Quality, the SHS performs regular monitoring of the air, water and soil quality as well as atmospheric radiation background level. Among other responsibilities are monitoring of meteorological conditions, Prut and Dniester Rivers' water flow, hydrological forecast, weather forecast, agro-meteorological monitoring and forecast, etc.

State Agency for Geology and Mineral Resources (AGeoM). The AGeoM is responsible for promoting of state policy in the field of management and monitoring of underground resources in Moldova and provides an overall umbrella for state organizations and enterprises specialized in field of underground water use; administrations at district and regional level, as well as organizations specialized in the design and investigation of underground water objects. It performs management of underground water resource and their protection; counting of groundwater resources and monitoring of groundwater quality and regime.

State Agency "Apele Moldovei". Agency "Apele Moldovei" is subordinated to the Ministry of Environment. It is the central technical and administrative organization dealing with surface water resources, and is responsible for management of water resources used for irrigation, domestic and industrial water supply purposes as follows: development of long-term programs concerning river basins and water administration works throughout the country, including centralized water supply facilities, irrigation and drainage, protection against floods or other damage, coordinating of construction, design, and operation activities in the field of water.

Ministry of Healthcare. The Ministry of Healthcare is the central authority responsible for population health protection, and sanitary and epidemiological supervision in Moldova. Ministerial sub-division *National Centre for Public Health* performs regular sampling and analyzing water quality in water bodies and groundwater used for drinking water supply (tap water, artesian and shallow wells), and those used for recreation purposes.

National Institute for Standards and Metrology. The National Institute for Standards and Metrology is a sub-division of the Service of Standardization and Metrology which as a public administration authority subordinates directly to the Government. The Institute was designated as a National Metrology Body with responsibilities to develop metrological policy, assure the instrumental measurement results, development and adherence of national and reference standards, etc.

State Agency "Moldsilva". State Forestry Agency "Moldsilva" is a state institution subordinated directly to the Government. It is responsible for development and promotion of the state policy in the field of forest resources management through establishment forest resources management, forest research and monitoring, conservation and protection of forest fund; forestation of eroded and agricultural lands, etc.

1.2.2 Local Public Authorities

Among responsibilities of local public authorities on local (settlement) level are: approval and supervision of local programs in the field of environmental protection; protection and conservation of historical and natural monuments; natural parks and protected areas, and approval of admissible limit values of emissions and discharges (admissible level of environmental pollution) and limits of natural resources (water) use.

1.3 World Bank Environmental Assessment Policy, Rules and Procedure

1.3.1 World Bank's Safeguard Policies and their relevance to project

There are key 10 Environmental and Social World Bank Safeguard Policies which are intended to ensure that potentially adverse environmental and social consequences of projects financed by Bank are identified, minimized and mitigated. World Bank Safeguard Policies have a three-part format: *Operational Policies* (**OP**) - statement of policy objectives and operational principles including the roles and obligations of the Borrower and the Bank; *Bank Procedures* (**BP**) - mandatory procedures to be followed by the Borrower and the Bank, and *Good Practice* (**GP**) - non-mandatory advisory material. World Bank's Safeguard Policies and their relevance to sub-projects to be funded under the CEP II are indicated in the *Table 2* below.

Table 2. World Bank's Safeguard Policies and their relevance to sub-projects

Safeguard Policies	Relevance
Environmental Assessment (OP/BP 4.01) This Policy aims to ensure that projects proposed for Bank financing are environmentally and socially sound and sustainable; to inform decision makers of the nature of environmental and social risks; to increase transparency and participation of stakeholders in the decision-making process	**Yes** (refer to the description below)
Natural Habitats (OP/BP 4.04) This Policy aims to safeguard natural habitats and their biodiversity; avoid significant conversion or degradation of critical natural habitats, and t ensure sustainability of	**No.** As all proposed activities are to be implemented within existing agricultural land and settlement boundaries, the sub-projects to be supported under the project will not have impacts on wildlife and natural

Safeguard Policies	Relevance
services and products which natural habitats provide to human society	habitats, and thus, this OP is not triggered.
Forestry (OP/BP 4.36) This Policy is to ensure that forests are managed in a sustainable manner; significant areas of forest are not encroached upon; the rights of communities to use their traditional forest areas in a sustainable manner are not compromised	**No.** No wood harvesting sub-projects will be supported.
Pest Management (OP 4.09). This policy is to ensure pest management activities follow an Integrated Pest Management (IPM) approach, to minimize environmental and health hazards due to pesticide use, and to contribute to developing national capacity to implement IPM, and to regulate and monitor the distribution and use of pesticides	**Yes.** While the project will not support purchasing pesticides indirectly its activities may stimulate their increased usage.
Physical Cultural Resources (OP/BP 4.11) This policy is to ensure that: Physical Cultural Resources (PCR) are identified and protected in World Bank financed projects; national laws governing the protection of physical cultural property are complied with; PCR includes archaeological and historical sites, historic urban areas, sacred sites, graveyards, burial sites, unique natural values; implemented as an element of the EA	**No.** The EMF specifies there will be no impact on physical cultural resources, and therefore OP/BP 4.11 "Physical Cultural Resources" is not triggered. All proposed sub-projects will be screened in this regard and in the case there might be such impacts those projects will be not supported under the project.
Indigenous Peoples (OP/BP 4.10) IP – distinct, vulnerable, social and cultural group attached to geographically distinct habitats or historical territories, with separate culture than the project area, and usually different language. The Policy aims to foster full respect for human rights, economies, and cultures of IP, and to avoid adverse effects on IP during the project development.	**No.** This Policy is not applicable for Moldova.
Involuntary Resettlement (OP/BP 4.12) This policy aims to minimize displacement; treat resettlement as a development program; provide affected people with opportunities for participation; assist displaced persons in their efforts to improve their incomes and standards of living, or at least to restore them; assist displaced people regardless of legality of tenure; pay compensation for affected assets at replacement cost; the OP Annexes include descriptions of Resettlement Plans and Resettlement Policy Frameworks	**No.** Private businesses will be eligible to become project beneficiaries under the condition that they have not acquired and/or would not acquire land for the needs of activities to be supported with the project proceeds through a process which involved and/or would involve officially supported expropriation. Additionally, project funds will not support any sub-loans used to invest in a business which would require the involuntary displacement of existing occupants or economic users of any plot of land, regardless of its current ownership, or loss of or damage to assets including standing crops, kiosks, fences and other. The project operational manual will define a screening procedure to be filled by PFIs, and the Project Implementing Agency will closely monitor the screening procedure, with the support of the Bank task team. With these restrictions in place, the project does not trigger OP/BP 4.12 "Involuntary Resettlement".
Safety of Dams (OP/BP 4.37) This Policy is to ensure due consideration is given to the safety of dams in projects involving construction of new dams, or that may be affected by the safety or performance of an existing dam or dams under construction; important considerations are dam height & reservoir capacity	**No.** The project will not support any activities which might have impact on dam safety.
Projects on International Waterways (OP/BP 7.50) The Policy aims to ensure that projects will neither affect the efficient utilization and protection of international waterways, nor adversely affect relations between the Bank and its Borrowers and between riparian states	**No.** The project not finance any sub-projects which may affect international waterways and in particular: irrigation projects; projects involving discharging waste waters directly in the international waterways; abstraction or diversion of international waters;

Safeguard Policies	Relevance
	projects related to discharging waste materials in a location that could impact on international waters; construction of any dams that might affect international waters hydrological regime. These requirements represent screening criteria to be applied by the FIs.
Disputed Areas (OP/BP 7.60) The Bank may support a project in a disputed area if governments concerned agree that, pending the settlement of the dispute, the project proposed for one country should go foreword without prejudice to the claims of the other country	**No.** The project will not support any activities in disputed areas.
Disclosure Policy (BP 17.50) supports decision making by the borrower and Bank by allowing the public access to information on environmental and social aspects of projects and has specific requirements for disclosure	**Yes.** The EMF will be disclosed and consulted in the country before appraisal and in the WB InfoShop.

Reference Documents on World Bank's Operational Policies (OP) and Bank Procedures (BP) are presented in *Annex I.*

1.3.2 World Bank Screening Categories and Environmental Assessment Procedures

Environmental Screening is a Mandatory Procedure for the OP/BP 4.01 *Environmental Assessment*. The Bank undertakes environmental screening of each proposed project for which it will provide funding in order to determine the appropriate extent and type of the Environmental Assessment to be conducted.

The Bank classifies a proposed project into one of four categories, depending on the type, location, sensitivity and scale of the project and the nature and magnitude of its potential environmental impacts[1]. These four Categories are A, B, C, and FI.

Category A projects is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may be sensitive, irreversible, and diverse, with attributes such direct pollutant discharges large enough to cause degradation of air, water, or soil; large-scale physical disturbances of the site and/or surroundings; extraction, consumption, or conversion of substantial amounts of forest and other natural resources; measurable modifications of hydrological cycles; hazardous materials in more than incidental quantities; and involuntary displacement of people and other significant social disturbances. The impacts are likely to be comprehensive, broad, sector-wide, or precedent-setting. Impacts generally result from a major component of the project and affect the area as a whole or an entire sector. They may affect an area broader than the sites or facilities subject to physical works. The EA for a Category A project examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without project" scenario), and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. For a Category A project, the borrower is responsible for preparing a report, normally a full Environmental Impact Assessment (or a suitably comprehensive regional or sectoral EIA).

To the Category A projects correspond to activities listed in the Regulation on Environmental Impact Assessment (2000) and in the Order of Organization and Conducting of the State Ecological Expertise (2002) in case they attribute to newly planned activities/ enterprises.

[1] See: Environmental Assessment Update Sourcebook, Environmental Department, April 1993. The World Bank

Category B projects has potential adverse environmental impacts on human populations or environmentally important areas - including wetlands, forests, grasslands, and other natural habitats - which are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigatory measures can be designed more readily than for Category A projects. The scope of EA for a Category B project may vary from project to project, but it is narrower than that of Category A assessment. Like Category A, a Category B environmental assessment examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. The findings and results of EIA for Category B projects are described in the project documentation (Project Appraisal Document and Project Information Document).

To the Category B projects may be attributed all activities not listed in the Regulation on Environmental Impact Assessment (2000) and in the Order of Organization and Conducting of the State Ecological Expertise (2002) as well as those listed in above documents activities which attribute to already working enterprises which already passed through the procedures of Environmental Impact Assessment and State Ecological Expertise, e.g., to those, which according to the national procedure, require environmental impact assessment *only* for their newly developing parts (construction, reconstruction, rehabilitation, expansion of industrial facilities, etc.).

Category C. An EIA or environmental analysis is normally not required for Category C projects because the project is unlikely to have adverse impacts; normally, they have negligible or minimal direct disturbances on the physical setting. Professional judgment finds the project to have negligible, insignificant, or minimal environmental impacts. Beyond screening, no further EA action is required.

To the Category C projects mainly correspond activities related to the convention 3rd category of projects which are expected to have minor impacts on environment and therefore do not need to be passed through the formal procedures of EIA and SEE.

Category FI. A Category FI project involves investment of Bank funds through a financial intermediary, in sub-projects that may result in adverse environmental impacts.

The Bank reviews the findings and recommendations of the EIA to determine whether they provide an adequate basis for processing the project for Bank financing. When the borrower has completed or partially completed EA work prior to the Bank's involvement in a project, the Bank reviews the EA to ensure its consistency with this policy. The Bank may, if appropriate, require additional EA work, including public consultation and disclosure.

Examples of projects that fall under Categories A, B, and C are provided in the *Table 3* below. However, this list is just a good starting point and framework for the screening decision. Because of other factors involved such as project sitting, the nature of impacts, and the need for the EIA process to be flexible enough to accommodate them, the lists should not be used as the sole basis for screening.

Projects with multiple components are classified accordingly to the component that with the most significant adverse impact; if there is a Category A component, the project is classified as A, and, respectively, requires a full Environmental Impact Assessment.

Table 3. Types of projects under the World Bank's Categories A, B, and C

Category A *Projects/project components which may have diverse and significant impacts – normally require EIA*	**Category B** *Projects/project components which may have diverse and significant impacts – more limited EIA is appropriate*	**Category C** *Projects which are unlikely to have direct adverse impacts – no EIA is required*
• Dams and reservoirs; • Forestry production projects; • Irrigation, drainage and flood control (large scale); • Industrial plants (large scale*) and industrial estates, including major expansion, rehabilitation, or modification; • Aquaculture and marineculture (large scale); • Land clearance and leveling; • Mineral development • Port and harbor development; • Reclamation, new land development; • Resettlement and all projects with potentially major impacts on people; • River basin development; • Thermal and hydropower development; • Manufacture, transportation, and use of pesticides or other hazardous and/or toxic materials	• Agro-industries (small scale); • Electrical; transmission; • Irrigation and drainage (small scale); • Renewable energy; • Rural electrification; • Tourism; • Rural water supply and sanitation; • Watershed projects (management or rehabilitation); • Rehabilitation, maintenance, and upgrading projects (small-scale); • Protected areas and biodiversity conservation; • Rehabilitation or modification of existing industrial facilities (small scale); • Rehabilitation of highways or rural roads; • Energy efficiency and energy conservation	• Education; • Family planning; • Health; • Nutrition; • Institutional development; • Technical assistance; • Most human resource projects

Note: *Large scale here is defined as enterprises with annual sales of US$ 3 million or more equivalent

The selection of the category should be based on professional judgment and information available at the time of project identification. If the project is modified or new information becomes available, Bank EA policy permits to reclassify a project. For example, a Category B project might become Category A if new information reveals that it may have diverse and significant environmental impacts when they were originally thought to be limited to one aspect of the environment. Conversely, a Category A project might be reclassified as B if a component with significant impacts is dropped or altered. The option to reclassify projects relieves some of the pressure to make the initial decision the correct and final one.

Projects in Category B often differ from A projects of the same type only in scale. In fact, large irrigation and drainage projects are usually Category A, however, small-scale projects of the same type may fall into Category B, the same relates to aquaculture projects and many others. Projects entailing rehabilitation, maintenance or upgrading rather than new construction will usually be in Category B. A project with any of these characteristics may have impacts, but they are less likely to be "significant". However, each case must be judged on its own merits. Many rehabilitation, maintenance and upgrading projects as well as privatization projects may require attention to existing environmental problems at the site rather than potential new impacts. Therefore, an environmental audit may be more useful than an impact assessment in fulfilling the EA needs for such projects.

The selection of a screening category often depends also substantially on the project setting, while the "significance" of potential impacts is partly a function of the natural and socio-cultural surroundings. There are a number of locations which should cause to consider an "A" classification:

- in or near sensitive and valuable ecosystems - wetlands, natural areas, habitat of endangered species;
- in or near areas with archaeological and/or historical sites or existing cultural and social institutions;
- in densely populated areas, where resettlement may be required or potential pollution impacts and other disturbances may significantly affect communities;
- in regions subject to heavy development activities or where there are conflicts in natural resource allocation;
- along watercourses, in aquifer recharge areas or in reservoir catchments used for drinking water supply; and
- on lands or waters containing valuable resources (such as fisheries, minerals, medicinal plants, agricultural soils).

The World Bank's experience has shown that precise identification of the project's geographical setting at the screening stage greatly enhances the quality of the screening decision and helps focus the EIA on the important environmental issues.

1.3.3 Public Consultation and Disclosure

1.3.3.1 World Bank Public Consultation Procedure

For all Category A and B projects proposed for WB financing, during the EIA process, the borrower consults all involved parties, including project-affected groups and local nongovernmental organizations (NGOs) about the project's environmental aspects and takes their views into account. The borrower initiates such consultations as early as possible. For Category A projects, the borrower consults these groups at least twice: (a) shortly after environmental screening and before the terms of reference for the EA are finalized; and (b) once a draft EA report is prepared. In addition, the borrower consults with such groups throughout project implementation as necessary to address EA-related issues that affect them.

1.3.3.2 World Bank Disclosure Procedure

For meaningful consultations between the borrower and project-affected groups and local NGOs on all Category A and B projects proposed for IDA financing, the borrower provides relevant material in a timely manner prior to consultation and in a form and language that are understandable and accessible to the groups being consulted.

For a Category A project, the borrower provides for the initial consultation a summary of the proposed project's objectives, description, and potential impacts; for consultation after the draft EA report is prepared, the borrower provides a summary of the EA's conclusions. In addition, for a Category A project, the borrower makes the draft EA report available at a public place accessible to project-affected groups and local NGOs.

Any Category B EIA report for a project proposed for WB financing is made available to project-affected groups and local NGOs. Public availability in the borrowing country and official receipt by the Bank of Category A reports for projects proposed for WB financing, and of any Category B EA report for projects proposed for WB funding, are prerequisites to Bank appraisal of these projects.

1.3.3.3 The comparison of National and WB EA requirements

While the basic provisions of the National EA rules and procedures are to some extent similar to the WB requirements, there are several important differences. These differences are related

primarily to the following: (a) project environmental screening categories; (b) Environmental Management Plan; (c) EA disclosure and public consultation; and (d) EIA reviewing process.

Differences in screening categories. In the existing EIA legal framework there is formal EIA categorization system and the SEE requires all projects with a potential environmental impact should have in the project design an assessment of the potential impacts as well as a set of mitigation measures. Thus, as the project will sub-projects with some environmental impacts, all of them would require environmental assessment and respectively - ecological expertise. The projects which do not require an EA mainly correspond activities which are expected to have minor impacts on environment and therefore do not need to be passed through the formal procedures of EIA and SEE (sub-projects that propose purchasing agricultural or agro processing machinery, small scale construction or reconstruction activities). The scale of the project EA is decided in each concrete case by the SEE/Ecological Inspectors during the preliminary approval of the project location and of its technical specifications. In the case where World Bank and national categorization/EIA requirements differ, the more stringent requirement will apply. This refers mostly in the case of deciding about Category C sub-projects - the national EIA legislation doesn't refer to small scale activities, including construction and rehabilitation of various buildings. In these cases the client will apply the WB criteria.

Differences concerning EMP. While the national legislation requires for all projects with potential environmental impacts relevant mitigation measures, it doesn't require a special EMP which should specify, along with the proposed mitigation activities a monitoring plan and reporting requirements, institutional arrangements for EMPs implementation as well as doesn't require needed capacity building activities and necessary expenses in this regard. Similarly, in the case of Category B grant and sub-projects, the beneficiaries will be required to apply WB rules and prepare not a list of mitigation measures but EMPs.

Differences with regard to disclosure and public consultation. Conducted analysis shows there is no harmonization between World Bank and national requirements in this regard. According to national legislation, the EIA disclosure and public consultation is mandatory only for large projects (WB Category A projects). At the same time, per the SEE law the public might organize at its own initiative a public ecological expertise. Public expertise is being conducting on the basis of NGO's written request toward local public authority. While organizing such expertise, within seven days, the local public authorities should inform public association about taken decision concerning permission to do so. Public associations conducting ecological expertise are obliged to inform broad local public about beginning of expertise and its results. These associations have the right to obtain planned and project documentation as well as documentation on Environmental Impact Assessment and get acquainted with normative-technical documentation on conducting of the State Ecological Expertise. The results of public ecological expertise are delivering to the bodies conducting the State Ecological Expertise and to the bodies which make decision of implementation of activity – the subject of expertise. The results and conclusion of public ecological expertise have recommendation character and can have the juridical power only after their approval by the responsible state body in field of ecological expertise. The results of public ecological expertise can be published in mass-media, deliver to the local public authority, other stakeholders. In the case of World Bank EA policy, the Sub-borrower is responsible for conducting at least one public consultation for all Category B projects to discuss the issues to be addressed in the EMP or to discuss the draft EMP itself. Therefore, for the sub-project, the PIU will review any documentation of the public consultation conducted in the preparation of any national EA documentation to determine if it is consistent with the World Bank requirements. If the national public consultation is satisfactory, there would be no further consultation requirement. However, if no public consultation was conducted or the PIU determines that the public consultation documentation is not adequate, the sub-borrower will

be required to perform at least one public consultation to discuss the environmental issues of concern to the locally affected communities and include these issues in the content of the EMP. Documentation for the consultation should be submitted to the PIU as part of the sub-project file. Romanian language version of the EMP and the record of the public consultation should be located at in public location near the project site and, if available - on the sub-borrower website. Category B EIA sub-project would be made available to project-affected groups and local NGOs in an easily accessible PFI and/or PIU website.

1.3.4 Implementation

During project implementation, the borrower reports on: (a) compliance with measures agreed with the Bank on the basis of the findings and results of the EIA, including implementation of any EMP, as set out in the project documents; (b) the status of implementation of mitigatory measures; and (c) the findings of monitoring programs. The Bank conducts supervision of the project's environmental aspects on the implementation of the EIA provisions, including measures set out in the legal agreements, EMP, and other project documents.

2. Project Description

The project will help increase the competitiveness of Moldovan enterprises, in particular small and medium enterprises, by increasing their linkages with markets, improving their ability to access medium to long-term finance, and improving the business enabling environment.

The project consists of 3 main components:

I. Regulatory Reform Component. This Component intends to help the Government of Moldova to implement in a timely manner the implementation of its regulatory reform strategies[2] and would support three sub-components:

(1) strengthening regulatory reform governance and monitoring systems
(2) providing reform implementation support, and
(3) providing capacity building.

The Component will finance the TA activities, mainly consultant services, workshop and training and analytical activities.

II. SME Development Component. The sub-objectives of the SME Component of CEP-II are the following:

(a) Strengthen the capability of ODIMM and MIEPO to effectively address the needs of Moldovan SMEs with high growth and export development potential
(b) Improve the prospects for long-term sustainability of ODIMM and MIEPO and the programs which they administer through increased effectiveness of their programs and sufficient funding from both the Government and the private sector to maintain those programs
(c) Provide funding through a Matching Grant Facility (MGF) to Moldovan SMEs to address gaps in their ability to compete in exports to various markets, with a particular focus on exports to Europe under the Deep and Comprehensive Free Trade Agreement (DCFTA).

The component will provide Matching grants to help SMEs implement activities that will have a specific and direct impact on their export competitiveness. Project beneficiaries may be SMEs that export directly, as well as SMEs that export indirectly through sales to larger, exporting enterprises. The enterprises that apply must make a business case for how the activity will directly increase their export competitiveness. The activities to be financed by the project as part of this subcomponent are: (a) Provision of technical assistance to the Matching Grant Administrator for, *inter alia*: i) developing the matching grant manual; ii) designing the communication strategy; iii) conducting studies; and, iv) defining the monitoring and evaluation strategy; and (b) Provision of matching grants to selected Moldovan SMEs for accessing to business development services. BDS providers will support SMEs to, inter alia: i) improve

[2] The Roadmap for the Government's Actions to Remove Critical Barriers in the Business Environment for 2013-2014 (Business Roadmap), approved by the Government in November 2013; the Regulatory Reform Strategy and its Action Plan 2013-2020, approved by the Government in July 2013; and the Roadmap for Increasing Competitiveness, approved by the Government at the end of 2013; as well as future additional strategies and updates to these.

existing products and services; ii) create new products and services; iii) improve production processes; iv) improve business management; v) improve business image; vi) find new customers and markets; and, vi) to create and strengthen partnerships within the value chain.

SMEs that apply for the matching grant facility will complete a detailed application presenting a "business improvement project" that will directly impact their competitiveness in export-oriented value chains (direct or indirect exports). The project will have goals such as those listed in (b) above: develop a new export product, export existing products to new markets, exporting for the first time, selling new products into export-oriented value chains, or selling to a new customer in an export-oriented value chain. Companies will state the package of services that they require to achieve this objective, for instance: a market study; assistance from an industry expert in product development; assistance from an industry expert in product packaging, branding, etc.; business process re-engineering to improve productivity; international quality certification (e.g., ISO, HACCP); assistance from a marketing expert; and many more.

III. Access to Finance Component. The objective of the Access to Finance component is to improve access to medium to long-term finance for export-oriented enterprises, reduce barriers to finance due to high collateral requirements, and improve banks' credit risk assessment methodologies for SME financing. To achieve the above objective, this component will have three sub-components:

1. Line of credit (LOC) to provide medium to long term financing for working capital and investment purposes. The LOC will be extended through PFIs to creditworthy exporters for viable projects. The financing will include working capital and investments loans for the export-oriented enterprises. The selected sub-projects will be implemented country wide on demand by beneficiary enterprises for credit. It is expected most sub-projects will be implemented by small and medium-size companies from agricultural, agro-processing and manufacturing sectors. Activities that cannot be supported include: tobacco growing/ processing; production and processing of genetically modified organisms (GMOs), use of banned pesticides, use of species provided in Appendix 1 to the Bonn Convention on International Trade in Endangered Species of Wild Fauna and Flora, etc.

2. Risk Sharing Facility (RSF) to facilitate greater SME lending by reducing the credit risks that commercial banks face in expanding in this segment and by providing a new type of collateral i.e. guarantees to address SME financing constraints resulting from insufficient or unacceptable collateral. The technical assistance to be provided under this sub-component would support ODIMM in implementing a time-bound action plan aimed at revamping the design of existing guarantee mechanism and strengthening institutional capacity and governance to effectively implement its current guarantee programs.

3. Capacity enhancement for lending institutions. In partnership with the International Finance Corporation (IFC) and other development partners the project would provide technical assistance on a matching basis to the commercial banks benefitting from the credit line or Risk Sharing Facility, in order to help build their capacity to provide lending services to SMEs.

3. Analysis of Potential Environmental Impacts

3.1 Potential Environmental Impacts of Matching Grants

As mentioned in point 4 above the second project component would provide support for a series of TA and consultancy activities with regard to the following: (a) conducting studies; (b) provision of matching grants to selected Moldovan SMEs for accessing to business development services that might include: (i) improve existing products and services; (ii) create new products and services; (iii) improve production processes; (iv) improve business management; (v) improve business image; (vi) find new customers and markets; and, (vi) to create and strengthen partnerships within the value chain. While none of these activities will have any direct environmental impacts some of them, indirectly might generate some impacts during the implementation phases. In particular the TA activities that are targeted at developing business plans, creating new products, or improving production processes can generate some impacts relates to air and water pollution, waste management, labor and health risks, etc., and thus while selecting matching grants it would be also necessary to conduct their preliminary screening. Furthermore, during the screening process it will be possible not only to make a preliminary environmental assessment of matching grants, but, also to identify possible areas for improving environmental performances of proposed activities by identifying opportunities for sound environmentally and/or socially positive alternatives (e.g., energy efficiency, recycling and reducing waste generation, etc.).

3.2 Potential Environmental Impacts of Sub-loans

3.2.1 Important Environmental Components

The environmental components which may be adversely affected by sub-projects at their construction, operation and decommissioning stages generally are grouped as physical, biological and socio-economic ones. Examples of the environmental components which might be of a different levels and attributes are presented in the *Table 4* below.

Table 4. Environmental Components

Physical Components	Biological Components	Socio-economic Components
• Physical component of ecosystems (habitats) • Air • Soil (quality, structure, fertility, erodibility) • Land • Water resources (surface water &, underground water: quality, availability, hydrological regime) • Landscape/ Aesthetics, etc.	• Fauna • Flora • Vegetation communities/ forests • Animals' and plants' populations (number, abundance, distribution, etc.) • Biological component of forest, aquatic, meadow, steppe and other ecosystems (as a whole), etc. • Micro-organisms, etc	• Human health • Settlements • Cultural heritages • Employment • Demography • Income • Poverty • Gender • Education • Migration

3.2.2 Analysis of Potential Environmental Impacts from different types of sub-projects

The impacts associated with the different types of sub-projects might be positive and negative. *Positive impacts* attribute mainly to socio-economic environment. *Negative impacts* attribute to water, air and soil pollution, additional water and energy consumption (if more goods are produced), noise, odor, loss of biodiversity and habitats, etc. Measures to be taken to minimize potential negative environmental impacts depend on their type, magnitude, combination and distribution.

Potential Environmental Impacts from Manufacturing Sector. The industrial sector is responsible for air and water pollution, soil contamination and waste generation, including hazardous ones. Major pollution sources are the energy and heat generation units, mining, cement and lime productions. Some industrial activities lead to 'landscape pollution'; they generate noise and other nuisances. Data on the environmental impact of industry in the country is very limited. There is lack of integrated indicator of the industrial impact on the environment. Normally, releases volume and emissions value reported by the enterprises are being counted on the basis of the input and technology process data instead of to be directly measured. This occurs because almost all industrial laboratories have been liquidated. In whole, there is a lack of integrated indicators of the industrial impact on the environment. Industrial pollutants emissions into the atmosphere and discharges into surface waters are monitored by the Ecological Inspectorate at the subject of their compliance with established allowable values for further processing in accordance with the Law on Taxes for Pollution of the Environment (1998) and other applicable laws. This information is stored in the Ecological Inspectorate but not reported in official statistics. As a gap environmental management, and particularly, environmental pollution monitoring, there should be mentioned that industrial pollution is not being comprehensively analyzed, and reduction targets are not established in industrial development programs or other related documents. Though enterprises must report annually on their air emissions, wastewater discharges and waste generation reports are not mandatory for industry. Only waste generated by industries is being reported on a regular basis in official information sources since enterprises report annually to regional authorities on their annual waste generation. Based on these reports, taxes are calculated and collected from enterprises, though enterprises do not need permits for solid waste generation (only an authorization). Recent analysis of available fragmented data on environmental pollution from industrial sector has shown that water use, waste generation, greenhouse gases emission and atmospheric pollution are gradually reducing while economic activity is increasing (i.e., there is a some positive decoupling trend). Improvement of environmental efficiency in industry may result from structural changes (promoting less contaminating production) or/and technology upgrade (cleaner production technologies, end-of-pipe pollution reduction measures). Despite several structural reforms implemented in Moldova, they showed a little effect towards environmental improvement. Implementation of environmental policies in industrial sector needs to be improved through setting of and compliance with environmental priorities and targets, efficient monitoring and better coordination between ministries and use of economic mechanisms.

Environmental Impacts from Agricultural Production Sector. The present agriculture system practiced in Moldova can be characterized as extensive and poorly organized. This is detrimental both to agriculture production and the status of soils and other natural resources. Big share of lands used in agriculture does not allow maintaining sustainable balance between natural and anthropic ecosystems, what results in degradation of soil, adversely affects the biodiversity and an environment, as a whole. At the beginning of 2010, approximately one third of the land was under small farms of maximum 2-3 ha. The rest of agriculture land was consolidated to various extents and in various forms (e.g. leasing, cooperatives, farmers associations, etc.). A land

market is developing and agricultural land is being further consolidated. Since the consolidation of agriculture land is an ongoing process, now it is crucial to promote the approach of adapting agriculture activities to the concrete features of the landscape. Concerning potential impacts from crops production, during the last decade, the area of cereals (particularly wheat and corn) has increased considerably, while the areas cultivated with forage crops dropped. The increase of areas under corn resulted in considerable loss of the soil organic matter, especially on slopes (in Moldova 80% of agriculture land is on slopes). The share of tilled crops steadily increased although to conserve the soil the proportion of tilled crops should be kept within 50% of the sown area. The pesticides usage in agriculture are often out of control of environmental authorities because they are applied on private lands and their owners are not obliged by law to report on pesticides application. Over last years, the use of mineral fertilizer decreased 10-fold while amount of applied manure also dropped substantially. Cattle breeding also raised environmental problem because of overgrazing of pastures; besides since the majority of cattle is kept in private household, solid wastes generated by cattle are not managed properly what contributes to soil, underground and water pollution by organic substances and pathogens. Fertilizers application and pasturing also strongly contribute to pollution of surface waters by nutrients which enter the water bodies with surface run-off.

Potential Environmental Impacts from Agro-processing sector. The share of this sector is 50% from the total country's manufacturing. The main impacts from this sector are mostly relate to surface water and groundwater pollution through increased concentrations of pollutants in wastewater effluents and emissions to air, mostly dust and odor.

3.2.3 Positive Environmental Impacts

Sub-projects to be implemented under the Access to finance Component will generate a great number of both direct and indirect positive impacts. Direct positive impacts will be generated by increased production, products and goods within sectorial activities which would result in creation of new jobs and respectively, more employment, increased income, as well as from direct inputs from loans. Indirect positive impacts form sectorial activities will relate to overall improving of business environment, increased exports and secured enterprises domestic market position, introduction of advanced technologies and techniques, creating new opportunities for access to foreign markets, enhancement competitiveness of domestic production and products, contribution to poverty reduction and food safety, improvement of country's socio-economic conditions and others. Some positive direct and indirect impacts/ benefits generated by activities within concerned sectors and direct inputs from loans are presented in the *Tables 5-6* below.

Table 5. Positive impacts generated by sectorial activities

Sector	Positive impacts/ Benefits
Agriculture: Annual Crop & Plantation Crop Production; Meet & Poultry Production	Introduction of advances agricultural techniques, use of advanced machinery & equipment, increased crop and plantation crop production, mammalian livestock and poultry production; creating new opportunities for access to foreign markets, creating new jobs, contribution to ensuring of food security, contribution to poverty reduction in rural area and generally, to improvement of socio-economic conditions in rural areas, etc.
Aquaculture	Providing alternative source of protein nutrition for population thus contributing to improvement of human health, creating opportunities for export, creating new jobs & increased income, etc.
Agro-processing: Dairy, Meet and Poultry Processing, Vegetable Oil Processing, Sugar Manufacturing, Food and	Introduction of new technologies & quality standards at enterprises, use of advanced machinery & equipment, providing additional value to produced agricultural production, creating new opportunities for access to foreign markets, providing more food thus ensuring country's food safely; creating new

Sector	Positive impacts/ Benefits
Beverage Processing, etc.	jobs and better working conditions , especially for women and increased incomes, contribute to improvement of socio-economic conditions urban and rural areas, etc.
Manufacturing: Cement & Lime, Ceramics, Glass, Textile Manufacturing, Tanning & Leather Finishing, Printing, Construction Material Extraction, Surface Treatment of Metals and Plastics, Metal, Plastic & Rubber Products manufacturing, Sawmilling & Manufactured Wood Products, Board & Particle-based Products, Pharmaceuticals & Biotechnology, Semiconductors & Other Electronics manufacturing	Introduction of new technologies & quality standards at enterprises, use of advanced machinery & equipment, creating new opportunities for access to foreign markets; providing machinery and other equipment for other sectors of economy (e.g., farm machinery for agriculture), providing more goods thus contributing to improvement of living conditions, providing new jobs with better working conditions and increased incomes, improving women's labour market participation, etc.
Construction	Providing new jobs & better income, contributing to development of infra-structure, contribution to improvement of living and work safety conditions, and in general, to socio-economic conditions in urban and rural areas, etc.
Non-renewable resources manufacturing	Sand, aggregate materials, cement, lime provide the materials for new roads construction and rehabilitation of existing ones as well as for construction of new buildings of socio-economic designation; this may result in improved access to new, including foreign, markets and respectively; in improved incomes, more jobs and generally, in improvement of socio-economic conditions, etc.

Table 6. Positive impacts generated by direct loan inputs

Input	Positive Impact
Seeds - Agriculture: for Annual Crop & Plantation Crop Production, Aquaculture	Increased agricultural production; increased rural income; improvement of rural economy; contribution to country's food security, etc.
Fertilizers - Agriculture: for Annual Crop & Plantation Crop Production	Improved soil quality, increased agricultural production; increased rural income; rural economy improved; contribution to country's food security, etc.
Pesticides - Agriculture: for Annual Crop & Plantation Crop Production; Agro-processing: Mammalian Livestock & Poultry Production	Increased agricultural production; increased rural income; rural economy improved; contribution to country's food security, etc.
Pedigree seeds - Agriculture: Mammalian Livestock & Poultry Production	Fewer animals required for the same production volume; improved quality of production and respective products for markets, including foreign ones; increased farm income; improved rural economic situation, etc.
Animals for finishing and dairy - Agro-processing: Meet & Poultry Processing	Improved farm income & rural economic situation; contribution to country's food security, etc.
Machinery and other equipment – Agriculture, Agro-processing, Manufacturing	Reduced labor burden for rural employees; improved farms' efficiency; increased production volume, improved soil preparation, improved rural economic conditions, etc. In fact, for primary processing equipment the positive impact will be Additional value to agricultural production resulting in improved local economic situation through more jobs provided; improved farm income; reduction of n transportation costs and fuel consumption, etc..
Vehicles – all sectors	Improved labor efficiency resulting in improved profits
Construction – all sectors	In fact, for stock of machinery and chemicals the positive impact will be: Improved livestock husbandry; better protection of machinery against weather conditions thus contributing to farms net profit; prevention of chemicals'

Input	Positive Impact
	leakages and accidental spills thus improving local environment conditions, better chemicals' quality, etc.
Storage facilities – all sectors	In fact, for fuel, grain and other products, the positive impact will be: Easy fuel and lubricants handling, avoidance of fuel spills, decease of fuel wastage; decrease spoilage of crops and grains resulting in improved economic efficiency and higher farm incomes
Fencing materials – Agriculture	Reduced private plots' boundaries disputes; improved livestock husbandry; etc.
Fuel, lubricants – all sectors etc.	Ability to better run machinery and vehicles which will result to increased labor efficiency, increase income, etc.

3.2.4 Negative Environmental Impacts

Negative impacts mainly relate to physical and biological environmental components and are linked to water, air and soil pollution, soil erosion, loss of biodiversity and habitats, energy and water consumption as well as use of other natural resources. The major agricultural impacts are related to livestock and poultry production, both on the small farm holding and the large commercial farm. This may result in increased volumes of animal waste, including contaminated by pesticides affecting soil, groundwater (through leakage from septic tanks) and surface water quality, human health and biodiversity, as well as soil degradation/ compaction due intensive pasturing, loss of agricultural (and remained steppe) biodiversity, etc. In agro-processing sector the main impacts are related to surface water pollution through increased concentrations of pollutants in wastewater effluents and emissions to air, mostly dust and odor. In manufacturing sector main impacts are surface water pollution through increase concentrations of pollutants in wastewater effluents, emissions to air (dust/particulate matter, often toxic substances), acoustic, vibration, water and energy consumption, aesthetics. During construction activities which may have a relevance to all above sectors, the main negative impacts are generated during construction phase and relate to soil erosion, soil and water pollution through waste generation, air pollution, acoustic and aesthetics.

The most common potential negative impacts from sectoral activities and construction activities and their significance are summarized in the *Table 7* below.

Table 7. Potential negative impacts generated by sectoral activities and construction activities

Enterprise Category	Potential Impacts	Level of Significance
Agro-processing:	• Water and energy consumption • Water pollution • Soil pollution • Odor	High High Moderate High
Agriculture&Aquaculture	• Soil degradation (soil erosion, loss of productive capacity, compaction, etc.) • Soil pollution (e.g., by pesticides) • Surface (through runoffs) and underground (though infiltration) water pollution • Loss of agricultural biodiversity (due to cattle grazing) • Alien species (aquaculture), etc.	High High High High Moderate
Manufacturing	• Water and energy consumption • Surface water pollution by hazardous chemicals • Air pollution • Biodiversity/ habitats loss • Soil and water pollution through hazardous wastes generation and disposal	Very high Very high Very high Moderate Moderate
Extraction industry: Non-renewable	• Air pollution (dust, particulate matter) • Acoustic	High High

Enterprise Category	Potential Impacts	Level of Significance
resources	• Vibrations • Aesthetics, etc.	Moderate High
Construction (construction phase)	• Soil erosion • Soil pollution • Land degradation/ aesthetics • Air pollution • Acoustic • Water pollution	Moderate Moderate High Moderate High Moderate

More detailed description of impacts which may arise from each probable activity as per sectors of concerns are presented in the *Environmental Guidelines* (see *Annex E, F* and *G*).

3.2.5 Cumulative Environmental Impacts

Cumulative impacts are not likely to be an issue as the Project distributes its loan activities more or less evenly throughout the country. In the agricultural production sector, if there is a concentration of loans for the purchase of a large number of livestock in one particular watershed, without effective waste management, the main river of the watershed could become heavily polluted as a result of a high concentration of livestock.

Some activities may require additional water consumption thus contributing to lowering of groundwater table, or contribute to water pollution though additional polluted effluents thus contributing to deterioration of surface water quality and respectively, loss or degradation of aquatic habitats, biodiversity degradation, etc. Pesticide and chemical fertilizer use in agricultural production may have a severe cumulative effect. Enterprises in a single small watershed could cumulatively have a significant effect on surface water bodies, resulting in damaged of aquatic ecosystems and affecting water quality downstream, sometimes in adjacent countries. Similarly, the impact on water quality of a common river used by several processing plants could be significant.

The environmental concerns in manufacturing activities will mainly focus on emissions to air and effluent discharges. In spite, emissions and effluent within each activity have to comply with established requirements, cumulatively, all of the industries in one region (e.g. in a small closed valley with poor air circulation) could significantly contribute to the deterioration of overall air quality, resulting in impact on human health. However, taken into consideration that all mitigatory measures are taken, these impacts are not likely to be severe.

3.2.6 Residual Environmental Impacts

Residual impacts are those that remain after all mitigation has been carried out. Assuming that all mitigation as indicated in the guideline tables are implemented appropriately, the residual effects, even cumulatively on all sub-projects, should not be significant. Expert judgment on expected residual impacts from sectoral activities within sub-projects implementation once all mitigatory measures are taken is presented in *Annexes E, F* and *G*. Summary of probable residual impacts generated by sectoral activities is presented in the *Table 8* below.

The key issue to minimize residual impacts is an “effective management”; it means that, where required, comprehensive EIA and comprehensive ecological expertise has to be carried out, environmental management plans must be complied appropriately, be sound and implemented effectively, and effective monitoring has to be performed.

Table 8. Summary of potential residual impacts

Activity	Potential Residual Impact	Significance
Non-renewable resource extraction industry	Aesthetics	Moderate
Agriculture	Surface water & underground water pollution, soil pollution, soil erosion	Low-moderate
Agro-processing	Surface and underground water pollution, air pollution	Low
Manufacturing	Air & surface water pollution	Low-moderate
Construction	Surface water pollution, soil erosion	Low

4. Environmental Guidelines

4.1 Purpose of Environmental Guidelines

The purpose of the project Environmental Guidelines is to assist the PIU staff, the ODIMM and MIEPO (as the project implementing agencies (PIA)), CLD, PFI loan officers, and sub-borrowers in determining the potential environmental impacts of matching grants and sub-projects and specific conditions to each of the them to ensure that their potential impacts are minimized, if not entirely avoided. The Guidelines provide the anticipated matching grants and sub-project activities and the impacts that they may have on environmental components as well as mitigation measures to be undertaken to minimize or prevent impacts. In particular, the PIAs, CLD, PIU, and PFIs loan officers will use three sets of tables presented in the *Annexes E, F* and *G,* which will assist them in determining of environmental impacts that can be expected from different types of sub-projects in various sectors. Knowing the impacts to be expected from various types of sub-projects, the loan officer as well as the sub-project designer/beneficiary can define the mitigatory measures required as a condition for the loan. The Guidelines also provides criteria and procedures for matching grants EIA and recommendations for improving business proposals environmental performances which will be applied by PIAs. These Guidelines will be also be used for the purpose of environmental monitoring of sub-projects.

Since these are only guidelines and the information contained within is generalized, in some instances, the officers would be advised to seek local professional opinion (e.g., Ministry of Environment, agricultural and industrial extension staff, researchers, designers, etc.) for more specific information and advices.

4.2 Content of Environmental Guidelines

The Environmental Guidelines provide the following:

(a) Matching grants screening procedure and recommendations for improving environmental performances of different types of business proposals from SMEs;

(b) Rules and Procedures for sub-projects environmental screening to be funded under the Access to finance Component;

(c) Environmental Screening Checklist (presented in the *Annex A*);

(d) Content and format for the Management Plan to be complied for sub-projects and format for Environmental Monitoring Plan to be follow to achieve environmental protection requirements under the loan (*Annex B*); as well as,

(e) Tables that describe potential environmental impacts that may occur as a result of sub-project activities as well as needed mitigation and monitoring measures in three main sectors: Agricultural Production (*Annex E*), Agro-processing (*Annex F*), and Manufacturing & Construction (*Annex G*), which may be financed by the credit.

4.3 Matching Grants Screening Procedure and Recommendations for Improving Environmental Performances

As described above, the second Project Component would provide support for a series of TA and consultancy activities that might indirectly, during the implementation and operational phases generate some environmental and social impacts. In the development of business plans, creating new products, or improving production processes can generate some impacts relates to air and water pollution, waste generation, labor and health risks, etc. Based on that, the PIA (ODIMM and MEIPO) jointly with PIU Environmental Specialist will conduct preliminary screening of proposed Matching grants and identify those which might require an EIA and/or a simple EMP. The screening process will also allow these institutions not only to make a preliminary environmental assessment of matching grants, but also to identify possible areas for improving environmental performance of proposed activities by identifying opportunities for sound environmentally and/or socially positive alternatives (e.g., energy efficiency, recycling and reducing waste generation, etc.).

The *Table 9* below presents proposed TA activities under the second Project Component and criteria for and suggested screening categories.

Table 9. TA activities, criteria and suggested screening categories

TA activity	Category B	Category C	Comments
Improve existing products and services		X	Environmental screening procedures for existing facilities if applicable
Create new export products and services	X		It can generate new air and water pollution and wastes, have labor and health risks, energy inefficiency etc.
Improve production processes	X		It can generate additional air and water pollution and wastes, increase labor and health risks, have energy inefficiency etc. Environmental screening procedures for existing/new facilities should be applicable
Improve business management		X	N/A
Improve business image		X	N/A
Find new customers and markets		X	N/A
Create and strengthen partnerships within the value chain		X	N/A
Market study		X	N/A
Assistance from a marketing experts as well as from an industry experts in product packaging, branding, in product development, etc.		X	N/A
International quality certification (e.g. ISO, HACCP)		X	N/A
Business process re-engineering to improve productivity	X		It can generate additional air and water pollution and wastes, increase labor and health risks, energy inefficiency etc. Environmental screening procedures for existing/new facilities should be applicable
Export existing products to new markets, exporting for the first time, selling new products into export-oriented value chains, or selling to a new customer in an export-oriented value chain		X	N/A

While the grant activities considered as Category B, as such, will not generate any adverse environmental and social impacts, if the EIA is not done appropriately, indirectly it may cause some environmental and social risks during the project implementation. If the Environmental Specialist's preliminary screening and consultation with the technical committee of the MGF Administrator (which may include participation of the PIU, ODIMM and MIEPO) concludes that an environmental assessment (EA) should be conducted for the activities the matching grant will fund, ODIMM, MIEPO and PIU Environmental Specialist will review the TOR for the EA to ensure it is in compliance with the national and WB safeguards policies. The TOR for EA study should be disclosed on the website of the Matching Grant Facility Administrator or one of the members of the technical committee (e.g., ODIMM or MIEPO – to be determined during project implementation) and virtually consulted with interested parties before the award of the matching grant.

As specified above, during the grants screening it is necessary to identify opportunities for sound environmentally and/or socially positive alternatives (*Table 10*).

Table 10. Type of grants and issues to be looked at

Type of grants	Environmental issues
Create new export products and services	Air/water/soil pollution prevention and control technologies applying, wastes reducing and recycling, health and labor safety ensuring, energy efficiency implementing etc.
Improve production processes	Air/water/soil pollution prevention and control technologies improving, wastes reducing and recycling, health and labor safety improving, energy efficiency increasing etc.
Business process re-engineering to improve productivity	Air/water/soil pollution prevention and control technologies applying, wastes reducing and recycling, health and labor safety improving, energy efficiency increasing etc.

For all of proposed types of grants (activities) the national environmental legislation prescribes to comply with the existing regulations on: Environmental Impact Assessment and State Ecological Expertise, Construction/rehabilitation authorization, Authorization on emissions of environmental pollutants, Water use authorization, Waste disposal permit, Technological safety authorization etc., according to individual specific sub-project activities.

4.4 Rules and Procedures for Environmental Screening of Sub-projects

4.4.1 Introductory notes

Screening of each proposed project for funding is to be undertaken in order to determine the appropriate extent and type of Environmental Impact Assessment as well as which one of ten World Bank's Policies will be triggered. The attribution of the project type to WB's EA category and respectively, environmental risk that might be generated (i.e., high risk – by the Category A sub-projects; from moderate to low risk – by the Category B sub-projects, and from low to no risk - by the Category C sub-projects) is to some extent, an expert judgment.

Generally the significance of impacts and the selection of screening category accordingly, depend on the *type* and *scale* of the project, the *location* and *sensitivity* of environmental issues, and the *nature* and *magnitude* of the potential impacts.

In terms of type and scale of the projects. Usually the following projects are considered as having "significant" impacts and respectively should be qualified as Category A sub-projects:

- significantly affect human populations or alter environmentally important areas, including wetlands, native forests, grasslands, and other major natural habitats.
- "significant" potential impacts might be also considered the following: direct pollutant discharges that are large enough to cause degradation of air, water or soil;
- large-scale physical disturbance of the site and/or surroundings;
- extraction, consumption, or conversion of substantial amounts of forest and other natural resources;
- measurable modification of hydrologic cycle;
- hazardous materials in more than incidental quantities;
- and involuntary displacement of people and other significant social disturbances.

In terms of location. There are a number of locations which should be considered while deciding to qualify the project as Category "A":

- in or near sensitive and valuable ecosystems — wetlands, wildlands, and habitat of endangered species;
- in or near areas with archaeological and/or historical sites or existing cultural and social institutions;
- in densely populated areas, where resettlement may be required or potential pollution impact and other disturbances may significantly affect communities;
- in regions subject to heavy development activities or where there are conflicts in natural resource allocation; along watercourses, in aquifer recharge areas or in reservoir catchments used for potable water supply; and on lands or waters containing valuable resources (such as fisheries, minerals, medicinal plants, prime agricultural soils).

In terms of sensitivity. This is in the case when the project might involve activities or environmental features that are always of particular concern to the Bank as well as to the borrower. These issues may include (but are not limited to): conversion of wetlands, potential adverse effects on protected areas or sites, involuntary resettlement, impacts on international waterways and other transboundary issues, and toxic waste disposal.

In terms of magnitude. There are a number of ways in which magnitude can be measured, such as the *absolute amount* of a resource or ecosystem affected, the *amount affected relative to the existing stock* of the resource or ecosystem, the *intensity* of the impact and its *timing* and *duration*. In addition, the *probability of occurrence* for a specific impact and the *cumulative impact* of the proposed action and other planned or ongoing actions may need to be considered.

Examples of projects that fall under Categories A, B, and C are provided in the *Table 3*. However, this list is just a starting point and framework for the screening decision. Because of other factors involved such as project sitting, the nature of impacts, and the need for the EIA process to be flexible enough to accommodate them, the lists should not be used as the sole basis for screening.

As there is a general compliance between World Bank and conventional Moldovan project categories liable to various types of the environment assessment while during conducting environmental screening it is necessary to take into consideration the following:

- *To the Category A projects* will be attributed all planned activities which require a full EIA study and listed in the Regulation on Environmental Impact Assessment (2000) and in the Order of Organization and Conducting of the State Ecological Expertise (2002) in case they attribute to newly planned activities/ enterprises, as well as those which the ME considers as projects which also need a full EIA (projects placed in or in the vicinity of environmentally sensitive areas and habitat of endangered species; in or near areas with archaeological and/or historical sites or existing cultural and social institutions).
- *To the Category B projects* may be attributed all planned activities which may have adverse impacts on the environment but not listed in the Regulation on Environmental Impact Assessment (2000) and in the Order of Organization and Conducting of the State Ecological Expertise (2002). Additionally, Category B might be attributed to those listed in above documents projects/ enterprises, which were already built and, respectively, passed through the procedure of the State Ecological Expertise, but the purpose of funding is their upgrading/improvements. In these cases environmental impact assessment is required only for their newly developing parts (construction, reconstruction, rehabilitation, expansion of industrial facilities, etc.).
- *To the Category C projects* will be mainly attributed those which are expected to have minor impacts on environment and therefore are not needed to be passed through the formal procedures of EIA and SEE.

For Category C projects beyond screening, no further EIA action is required. If the FIs and CLD meet difficulties with WB categorization of projects it should consult the PIU Environmental Specialist.

4.4.2 Types of sub-projects that will be not supported by the CEP-II

The CEP-II does not support sub-projects, and will be excluded from the sub-project financing, that do not fall within one of its environmental conditions summarized below:

(i) in the case some of the sub-projects may cause significant impacts for which it would be necessary a full EIA (Category A sub-projects);
(ii) any investments related to wood harvesting (Ref.: OP/BP 4.36 Forestry);
(iii) production and processing of Genetically Modified Organisms (GMOs);
(iv) the sub-projects located in protected areas, critical habitats or culturally or socially sensitive areas (Ref.: OP/BP 4.36 Forestry, OP/BP 4.04 Natural Habitats, OP/BP 4.11 Physical Cultural Resources);
(v) any sub-loans used to invest in a business which would require the involuntary displacement of existing occupants or economic users of any plot of land, regardless of its current ownership, or loss of or damage to assets including standing crops, kiosks, fences and other (Ref.: OP/BP 4.12 Involuntary Resettlement);
(vi) purchasing pesticides (Ref.: OP 4.09 Pest Management);
(vii) large scale irrigation systems and sub-projects involving discharging waste waters directly in the international waterways, abstraction or diversion of international waters, sub-projects related to discharging waste materials in a location that could impact on international waters, construction of any dams that might affect international waters hydrological regime, etc. (Ref.: OP/BP 7.50 Projects on International Waterways).

The CEP II will also not support other types of sub-projects that are specified in the IFC/WB Exclusion List (*Table 11*).

Table 11. The IFC/WB Exclusion List

☒ Production or trade in any product or activity deemed illegal under host country laws or regulations or international conventions and agreements, or subject to international bans, such as pharmaceuticals, pesticides/herbicides, ozone depleting substances, PCB, wildlife or products regulated under CITES.
☒ Production or trade in weapons and munitions.*
☒ Production or trade in alcoholic beverages (excluding beer and wine).*
☒ Production or trade in tobacco.*
☒ Gambling, casinos and equivalent enterprises.*
☒ Production or trade in radioactive materials. This does not apply to the purchase of medical equipment, quality control (measurement) equipment and any equipment where IFC considers the radioactive source to be trivial and/or adequately shielded.
☒ Production or trade in unbonded asbestos fibers. This does not apply to purchase and use of bonded asbestos cement sheeting where the asbestos content is less than 20%.
☒ Drift net fishing in the marine environment using nets in excess of 2.5 km. in length.
☒ Production or activities involving harmful or exploitative forms of forced labor**/harmful child labor.***
☒ Production or trade in wood or other forestry products other than from sustainably managed forests.
☒ Production, trade, storage, or transport of significant volumes of hazardous chemicals, or commercial scale usage of hazardous chemicals. Hazardous chemicals include gasoline, kerosene, and other petroleum products.
☒ Production or activities that impinge on the lands owned, or claimed under adjudication, by Indigenous Peoples, without full documented consent of such peoples.

Notes:
* This does not apply to project sponsors who are not substantially involved in these activities. "Not substantially involved" means that the activity concerned is ancillary to a project sponsor's primary operations.
** Forced labor means all work or service, not voluntarily performed, that is extracted from an individual under threat of force or penalty.
*** Harmful child labor means the employment of children that is economically exploitive, or is likely to be hazardous to, or to interfere with, the child's education, or to be harmful to the child's health, or physical, mental, spiritual, moral, or social development.

4.4.3 Environmental Impact Assessment of Category B of sub-projects

After the FI's and CLD initial environmental screening of sub-project proposal, for the Category B sub-projects – the sub-borrowers should initiate a site specific EIA and EMP and/or prepare a simple EMP and/or a EMP Checklist in order to identify, evaluate and prevent potential environmental impacts and identify mitigation measures that may be incorporated into the project design. The purpose of the EIA and/or EMP is to predict potential effects and improve the environmental aspects of sub-projects by minimizing, mitigating or compensating for negative effects. The EIA should be conducted for the entire enterprise regardless of loan's size or any other specific features of a loan. *Terms of Reference for an Environmental Impact Assessment* is attached as *Annex A/Form 3* of the EMF. The project's applicant is responsible for conducting this study.

4.4.4 Impacts Prevention/Mitigation

Based on the existing WB and national EIA rules and procedures, all potential impacts from planned economic activities have to be identified and the set of mitigation measures has to be outlined. Furthermore, since preventive measures are favored over mitigatory or compensatory measures, the Project will provide capacity building to all involved parties and especially to the PIU, CLD and PFIs, to avoid or minimize potential environmental impacts through applying a set of good practices directed to sub-borrowing enterprise through providing guidance on

environmental sustainability matters when advising on agricultural production, agro-processing and industrial activities. The project will also support environmentally sustainable industry and agriculture technologies, including organic farming, and provide stakeholders by education on environmentally sound practices.

In relation to sectors to be covered by sub-project activities, the generated negative environmental impacts and environmental issues might be such as: surface and underground water pollution, including by hazardous chemicals; soil and water pollution due to wastes generation and improper disposal; as well as use and storage of hazardous materials; air pollution due to emission; soil and land degradation; loss of biodiversity and habitats; water and energy consumption; noise, odor and others; which may affect various environmental components. Description of potential impacts which may arise from sub-projects from agricultural production, agro-processing and manufacturing sectors as well as typical measures to be taken to prevent and mitigate impacts are presented in the *Annexes E (Agricultural Production & Aquaculture), F (Agro-processing & Food Production)* and *G (Manufacturing & Construction)* of the EMF.

The full set of preventive and mitigatory measures for activities in Agricultural & Agro-processing and Manufacturing sectors were developed by the World Bank Group in 2007 in its Environmental, Health, and Safety Guidelines[3], as well as outlined in the Best Available Techniques to the EU Integrated Pollution Prevention Control Directive[4], documents which could be consulted while conducting the EIA studies and preparing the Environmental Management Plans.

4.4.5 Steps to be followed while performing EIA of sub-projects

The steps to be followed while performing sub-projects EIA procedure, along with the responsibilities of the various concerned institutions are presented in *Table 12* below.

The screening should be done at the initial stage of the sub-projects selection. Based on the description of the proposed activities and on their potential environmental impacts, the FIs will decide which project category should be attributed. For the purpose of sub-project environmental impact assessment it should be used a special checklists and templates (see *Annexes A-D*). These documents will be attached to all submitted sub-project proposals (*Table 13*).

Table 13. Environmental Impact Assessment Procedure Documents by sub-project categories

Pre-parer	EIA Document	Sub-project activities and categories					
		For new facilities		For existing facilities		Construction/ rehabilitation	
		C	B	C	B	C	B
B	Environmental Screening Checklist *Part 1* (Annex A/Form 1)	X	X			X	X
PFI	Environmental Screening Checklist *Part 2* (Annex A/Form 1)	X	X			X	X
PIA	Environmental Screening Checklist *Part 3* (Annex A/Form 1)	X	X			X	X
PIA	Environmental Screening Checklist *Part 4* (Annex A/Form 1)		X				X
PIA	Field Inspection Checklist (Annex A/Form 2)		X				X
B	Environmental Impact Assessment Study		X				X

[3] See: http://www.ifc.org/ifcext/sustainability.nsf/Content/EnvironmentalGuidelines
[4] See: http://europa.eu/legislation_summaries/environment/waste_management/l28045_en.htm

Pre-parer	EIA Document	Sub-project activities and categories					
		For new facilities		For existing facilities		Construction/ rehabilitation	
		C	B	C	B	C	B
	(Annex A/Form 3)						
B	Environmental Screening Checklist *Part 1* (Annex C/Form 1)			X	X		
PFI	Environmental Screening Checklist *Part 2* (Annex C/Form 1)			X	X		
PIA	Environmental Screening Checklist *Part 3* (Annex C/Form 1)			X	X		
B	Environmental Audit Protocol Outline (Annex D)				X		
B	Environmental Management Plan (Annex B/Forms 1-2)		X				X
B	Environmental Monitoring Plan (Annex B/Form 3)		X				X
B	Environmental Management Plan Checklist for small scale constructions/rehabilitations (Annex A/Form 4)					X	X

Note: B – beneficiary, sub-borrower; PFI – participating financial intermediary; PIA – project implementation agency.

Table 12. Steps to be followed while performing the EIA procedure of sub-projects

Steps	Category A sub-projects	Category B sub-projects	Category C sub-projects
Step 1	1) The potential sub-borrower and the PFIs officers prepare an ***initial sub-project concept*** and submit it to PFI. ***Notes:*** i) The sub-borrower is responsible for obtaining ***appropriate permits and approvals*** that may be required for the particular type of activity to be financed, and are issued by the local authorities responsible for environmental issues. It should be noted also that a ***construction permit*** would be required in case of new construction or substantial reconstruction; ii) At this time the sub-borrower may initiate preliminary discussions, if needed, with the respective of environmental authorities to determine requirements for environmental review		
Step 2	2) If the sub-project receives preliminary endorsement of PFI, the sub-borrower completes *Part 1* of the ***Environmental Screening Checklist*** (*Annex A/Form 1*)		
Step 3	3) PFI based on the findings of the environmental screening and scoping process completes *Part 2* of the ***Environmental Screening Checklist*** (*Annex A/Form 1*)		
Step 4	4) PIA, based on the Environmental Screening Checklist, after consulting the PIU Environmental Specialist, when necessary, ***determines the environmental category, and makes a conclusion that a full EIA should be done*** and informs sub-borrower that such sub-project cannot be supported by the project.	4) PIA, based on the Environmental Screening Checklist, after consulting the PIU Environment Specialist, when necessary, ***determines the environmental category of sub-project is "B", and makes a conclusion what kind of EIA is to be conducted*** – an EIA and an EMP and/or partial EIA, or an EMP Checklist, including or not an environmental site assessment, or applying the screening procedure as for "existing facilities", and informs sub-borrower	4) PIA, based on the Environmental Screening Checklist, after consulting the PIU Environment Specialist, when necessary, ***determines the environmental category of the subproject is C and approves for financing,*** and informs sub-borrower
Step 5	N/A	5) In the case of a sub-project which require an EIA and EMP and/or an environmental site assessment, the PFI, PIA and/or PIU Environmental Specialist organizes a field site visit and completes the ***Field Site Visit Checklist*** (*Annex A/Form 2*)	N/A
Step 6	6) PIA in consultation with PIU Environmental Specialist, when necessary, completes *Part 3* of the ***Environmental Screening Checklist*** (*Annex A/Form 1*)		
Step 7	N/A	7.1) If the applicant wishes to follow further, she/he arranges preparation of ***Environmental Impact Assessment of a required level*** and an ***Environmental Management Plan***;	N/A

Steps	Category A sub-projects	Category B sub-projects	Category C sub-projects
		7.2) For that PFI/PIA provides the sub-borrower the *Terms of Reference* for preparation of EIA study (*Annex A/Form 3*) 7.3) At sub-borrower's request, an authorized institution prepares the Environmental Impact Assessment/Environmental Analysis and Environmental Management Plan ***Notes:*** i) Category B sub-projects which are listed in the *Instruction on the Order of Organization and Conducting of the State Ecological Expertise*, which presume new construction, substantial technological modernization, application of new technologies, change of land use patterns "some Environmental Assessment" is a subject of the *State Ecological Expertise*; ii) In the case of small scale construction and reconstruction activities it is recommended to apply a generic ***Environmental Management Plan Checklist***, proposed by the WB to address potential environmental impacts; this document is provided in *Annex A/Form 4*; iii) ***Content and Description of the Environmental Management Plan*** are presented in *Annex B/Form 1* (*Parts 1-2*); iv) ***Environmental Management Plan Format*** is presented in *Annex B/Form 2*; v) ***Environmental Monitoring Plan Format*** is presented in *Annex B/Form 3*; vi) ***Measures to mitigate impacts*** which may be generated by sub-projects from Agricultural Production, Agro-processing and Manufacturing sectors are provided in *Annexes E*, *F*, and *G*, respectively.	
Step 8	N/A	8.1) The sub-borrower prepares and submits to PFI/PIA prepared ***Environmental Impact Assessment report and the EMP and/or EMP Checklist*** together with other documents needed for environmental approval as well as other relevant documentation upon PFI/PIA's request, when needed; 8.2) The PFI/PIA reviews the submitted documentation and completes *Part 4* of the	N/A

Steps	Category A sub-projects	Category B sub-projects	Category C sub-projects
		Environmental Screening Checklist (*Annex A/Form 1*) ***Notes:*** i) PFI/PIA may suggest some revisions and/or clarification (which the applicant has to provide upon PFI 's request), the Environmental Management Plan and accompanied all necessary permits (the applicant is responsible for obtaining appropriate permits, clearances and approvals which may be required by other local authorities); ii) PFI/PIA may return the EIA documents in case they didn't correspond to specified requirements	
Step 9	N/A	9) When the EIA is conducted and Statement on EIA is ready, the sub-borrower organizes its ***Disclosure and Public Consultation***, involving NGO's, community representatives, affected groups, etc. and records input from the public Formal Minutes records the participants as well as issues raised toward EIA, and recommended activities to further address stakeholders' concerns. ***Note:*** In the case of small scale sub-projects which require only an *EMP Checklist* the sub-borrower organize its *Disclosure without special public consultation.*	N/A
Step 10	N/A	10.1) After the consultation the sub-borrower incorporates the received recommendations as well as those received during the review and clearance by other public authorities into the sub-project technical design documentation (and Environmental Management Plan) and submit it for conducting of the *State Ecological Expertise.* ***Note:*** The Category B sub-projects which require only an EMP Checklists are not needed to be presented to the SEE 10.2) When required, sub-borrower gets also from the State Ecological Inspectorate the final Authorizations (permits) on use of the natural resources which is issued on the base of permits obtained from core institutions responsible for	N/A

Steps	Category A sub-projects	Category B sub-projects	Category C sub-projects
		management of these resources (State Agency "Apele Moldovei", State Agency for Geology, etc.), and Authorization (permit) on emission of pollutants on the basis of newly established by SEI for this particular activity (e.g., expansion of industrial facilities, etc.) maximum allowable emissions into environment (i.e., limits of pollutants' concentration in waste water effluents and in emissions into air).	
Step 11		11.1) Sub-borrower submits full set of Environmental Impact Assessment documents to PIA for their consideration and further decision on funding. 11.2) PIA shall inform the sub-borrower in writing regarding approval or rejection of financing. ***Note:*** The EIA documentation for the first two Category B sub-projects from each participating PFI will be subject to prior review and approval by the PIU and World Bank.	

4.5 Environmental Monitoring and Reporting

Environmental monitoring during the project implementation, which is to be performed by the PIU has to provide information about key environmental aspects of the project, particularly the project environmental impacts and the effectiveness of taken mitigation measures. Such information enables to evaluate the success of mitigation as part of project supervision, and allows corrective action(s) to be implemented, when needed. The EMF identifies monitoring objectives and specifies the type of monitoring, and their link to impacts and mitigation measures. Specifically, the monitoring section of the EMP 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.

If approved, during the sub-project's operation phase, PIU along with the local (rayon) representative of the State Ecological Inspectorate and other environmental agencies, when required, perform environmental supervision and monitoring to control compliance with agreed design and mitigation measures to ensure that it is in full compliance with the management plan. (Environmental Monitoring Plan Format is presented in *Annex B/Form 3*).

The status of compliance with agreed environmental mitigation measures is to be reported by the PIA and CLD in their regular (semiannually) reports on project implementation. In the case of non-compliance, the PFI officers (with State Environmental Inspectorate and PIU assistance) investigate the nature and reason(s) for non-compliance, and a decision has to be made on what is needed to bring a sub-project into compliance, or whether financing should be suspended.

The PIU makes available information on PFI/PIA monitoring of environmental management plans and mitigation measures in its routine reporting on sub-project implementation to the World Bank and during periodic Bank supervision missions.

4.6 Sub-projects' Environmental Impact Assessment Disclosure and Consultation

Disclosure of the EIA documents for Category B projects is mandatory, and is to be done at a public place accessible to project-affected groups & local NGOs. This might be at the beneficiary web site/office, local authority offices and/or the central State Ecological Inspectorate or its rayonal sub-division. Furthermore, the sub-borrower provides a forum or hearing for consultation and comment by project-affected groups ensuring balanced representation and voice for both women and men and local non-governmental organizations during the environmental assessment process and takes their views into account before finalizing project design and submission of the sub-project to the PFI/PIA and to PIU for final approval. The sub-borrower provides any relevant materials (process descriptions, maps, building plans, etc.) to participants in a timely manner and in a form and language that are understandable to the group being consulted and records and describes details of consultations held in the project screening form.

In the case of Category B sub-projects the consultation can be done at the stage when the draft EIA report is ready.

However, in case of new small construction, insignificant reconstruction, change of machinery and equipment on a new, more ecological one, purchase and application of small amount of fertilizers, purchase of a small quantity of cattle or poultry for production and processing and some others which will not significantly affect the environment, there will be no need for a special public hearing but the project proponent should provide information to all interested parties about these activities. In the case of construction/reconstruction activities the project beneficiaries should also install a notice plate placed in the site of project implementation.

5. Pest Management Issues

The pest management issues which can be potentially raised by the project may relate to possible indirect effect of stimulating greater use of agro-chemicals associated with more intensive cultivation and/ or higher crop value.

The objective of EMF in this regard is to encourage adoption of Integrated Pest Management approach and increase beneficiaries' awareness of pesticide-related hazards and good practices fro safe pesticides use and handling.

5.1 Principles of the Integrated Pest Management[5]

The primary aim of pest management is to manage pests and diseases that may negatively affect production of crops so that they remain at a level that is under an economically damaging threshold. Pesticides should be managed to reduce human exposure and health hazards, to avoid their migration into off-site land or water environments and to avoid ecological impacts such as destruction of beneficial species and the development of pesticide resistance. One important strategy is to promote and facilitate the use of Integrated Pest Management (IPM) through preparation and implementation of an Integrated Pest Management Plan (PMP).

Integrated Pest Management (IPM) consists of the judicious use of both chemical and non-chemical control techniques to achieve effective and economically efficient pest management with minimal environmental contamination. IPM therefore may include the use of: a) Mechanical and Physical Control; b) Cultural Control; c) Biological Control, and d) rational Chemical Control.

Integrated Pest Management (IPM) is the use of multiple techniques to prevent or suppress pests in a given situation. Although IPM emphasizes the use of nonchemical strategies, chemical control may be an option used in conjunction with other methods. Integrated pest management strategies depend on surveillance to establish the need for control and to monitor the effectiveness of management efforts. World Bank Group in the Environmental, Health, and Safety Guidelines prepared in 2007 provides the following stages should be considered when designing and implementing an Integrated Pest Management Strategy, giving preference to alternative pest management strategies, with the use of synthetic chemical pesticides as a last option. As a first essential step, those who make pest management decisions should be provided with training in identification of pests and beneficial (e.g. natural enemy) species, identification of weeds, and field scouting methods to evaluate which pests are present and whether they have reached an economic control threshold (the density at which they begin to cause economically significant losses).

[5] This section is based on the World Bank Group in the Environmental, Health, and Safety Guidelines prepared in 2007.

5.2 Alternatives to Pesticide Application

Where feasible, the following alternatives to pesticides should be considered:

- Rotate crops to reduce the presence of pests and weeds in the soil ecosystem;
- Use pest-resistant crop varieties;
- Use mechanical weed control and/or thermal weeding;
- Support and use beneficial organisms, such as insects, birds, mites, and microbial agents, to perform biological control of pests;
- Protect natural enemies of pests by providing a favorable habitat, such as bushes for nesting sites and other original vegetation that can house pest predators and by avoiding the use of broad-spectrum pesticides;
- Use animals to graze areas and manage plant coverage;
- Use mechanical controls such as manual removal, traps, barriers, light, and sound to kill, relocate, or repel pests.

5.3 Pesticide Application

If pesticide application is warranted, users are recommended take the following actions:

- Train personnel to apply pesticides and ensure that personnel have received applicable certifications or equivalent training where such certifications are not required;
- Review and follow the manufacturer's directions on maximum recommended dosage or treatment as well as published reports on using the reduced rate of pesticide application without loss of effect, and apply the minimum effective dose;
- Avoid routine "calendar-based" application, and apply pesticides only when needed and useful based on criteria such as field observations, weather data (e.g. appropriate temperature, low wind, etc.),
- Avoid the use of highly hazardous pesticides, particularly by uncertified, untrained or inadequately equipped users. This includes:
- Pesticides that fall under the World Health Organization Recommended Classification of Pesticides by Hazard Classes 1a and 1b should be avoided in almost all cases, to be used only when no practical alternatives are available and where the handling and use of the products will be done in accordance with national laws by certified personnel in conjunction with health and environmental exposure monitoring;
- Pesticides that fall under the World Health Organization Recommended Classification of Pesticides by Hazard Class II should be avoided if the project host country lacks restrictions on distribution and use of these chemicals, or if they are likely to be accessible to personnel without proper training, equipment, and facilities to handle, store, apply, and dispose of these products properly;
- Avoid the use of pesticides listed in Annexes A and B of the Stockholm Convention, except under the conditions noted in the convention and those subject to international bans or phaseouts;
- Use only pesticides that are manufactured under license and registered and approved by the appropriate authority and in accordance with the Food and Agriculture Organization's (FAO's) International Code of Conduct on the Distribution and Use of Pesticides;
- Use only pesticides that are labeled in accordance with international standards and norms, such as the FAO's Revised Guidelines for Good Labeling Practice for Pesticides;

- Select application technologies and practices designed to reduce unintentional drift or runoff only as indicated in an IPM program, and under controlled conditions;
- Maintain and calibrate pesticide application equipment in accordance with manufacturer's recommendations. Use application equipment that is registered in the country of use;
- Establish untreated buffer zones or strips along water sources, rivers, streams, ponds, lakes, and ditches to help protect water resources;
- Avoid use of pesticides that have been linked to localized environmental problems and threats.

5.4 Pesticide Handling and Storage

Contamination of soils, groundwater, or surface water resources, due to accidental spills during transfer, mixing, and storage of pesticides should be prevented by following the hazardous materials storage and handling recommendations. These are the following:

- Store pesticides in their original packaging, in a dedicated, dry, cool, frost-free, and well aerated location that can be locked and properly identified with signs, with access limited to authorized people. No human or animal food may be stored in this location. The store room should also be designed with spill containment measures and sited in consideration of potential for contamination of soil and water resources;
- Mixing and transfer of pesticides should be undertaken by trained personnel in ventilated and well lit areas, using containers designed and dedicated for this purpose.
- Containers should not be used for any other purpose (e.g., drinking water). Contaminated containers should be handled as hazardous waste, and should be disposed in specially designated for hazardous wastes sites. Ideally, disposal of containers contaminated with pesticides should be done in a manner consistent with FAO guidelines and with manufacturer's directions;
- Purchase and store no more pesticide than needed and rotate stock using a "first-in, first-out" principle so that pesticides do not become obsolete. Additionally, the use of obsolete pesticides should be avoided under all circumstances; A management plan that includes measures for the containment, storage and ultimate destruction of all obsolete stocks should be prepared in accordance to guidelines by FAO and consistent with country commitments under the Stockholm, Rotterdam and Basel Conventions.
- Collect rinse water from equipment cleaning for reuse (such as for the dilution of identical pesticides to concentrations used for application);
- Ensure that protective clothing worn during pesticide application is either cleaned or disposed of in an environmentally responsible manner;
- Maintain records of pesticide use and effectiveness.

5.5 Pest Management Plan

The content of the Pest Management Plan should apply to all the activities and individuals working. It should be emphasized also that non-chemical control efforts will be used to the maximum extent possible before pesticides are used.

The Pest Management Plan should be a framework through which pest management is defined and accomplished. The Plan should identify elements of the program to include health and environmental safety, pest identification, and pest management, as well as pesticide storage, transportation, use and disposal. Management Plan is to be used as a tool to reduce reliance on pesticides, to enhance environmental protection, and to maximize the use of integrated pest management techniques.

The Pest Management Plan shall contain pest management requirements, outlines the resources necessary for surveillance and control, and describes the administrative, safety and environmental requirements. The Plan should provide guidance for operating and maintaining an effective pest management program/ activities. Pests considering in the Plan may be weeds and other unwanted vegetation, crawling insects and other vertebrate pests. Without control, these pests provoke plants' deceases. Adherence to the Plan will ensure effective, economical and environmentally acceptable pest management and will maintain compliance with pertinent laws and regulations. The recommended structure of a *Pest Management Plan* is presented in the *Annex H.*

6. Institutional Arrangements for the EMF implementation

6.1 General Remarks

The project will be implemented by the Ministry of Economy (MoE), which has been a counterpart of World Bank investment loans focusing on private sector development for over a decade. This includes the 2006-2013 CEP-I project as well as prior private sector development projects. It has implemented projects using Project Implementation Units (PIUs), established as separate legal entities under MoE, and staffed with professionals who know how to apply Bank procurement, financial management, safeguards and other rules. Implementation of CEP-II, including its fiduciary aspects, will be managed by the same PIU that managed CEP-I project activities. For the purpose of implementing environmental safeguards, within the PIU will be hired an Environmental Specialist (ES) with the main goal of coordination of all EA activities and adequate implementation of Environmental Management Framework requirements.

In coordination with and under supervision of the PIU the Project Implementing Agencies (ODIMM and MIEPO) will be responsible for implementation of the project Component 2 (SME Development). This component is targeted at improving the design, delivery mechanisms, and capacity to implement programs to facilitate SME development and exports, providing for this purpose matching grants. The component will be also focused on strengthening capacity of these public institutions in providing of public goods and overcoming market failures. As these are new institutions with no expertise on environment, it was agreed with the project they will receive TA. This will be provided by the full time PIU Environmental Specialist which should have good knowledge and experience in applying WB environmental safeguards and environmental management as well as general understanding of the WB social safeguards. The focus of capacity building activities will be on the following: assessing any potential negative environmental or social impacts of the business development proposals, conducting matching grants environmental screening and assessment, creating and/or strengthening Environmental Management Systems (EMSs), as well as looking for opportunities to recommend environmentally and/or socially positive options (e.g., energy efficiency, recycling and reducing waste generation, equal opportunities for women and men, etc.)

The implementation of Component 3 (that would provide access to finance for participating enterprises) will be done by Ministry of Finance Credit Line Directorate which is the same institution as within CEP-I and has extensive expertise in application of Bank Safeguard policies (outside of CEP-II it has managed several other line of credits financed under World Bank's Sector Rural Investment and Services Project). Furthermore, the CLD received adequate training to conduct screening of sub-loan applications for compliance with safeguards procedures. Based on WB implementation support missions the result of safeguards implementation of the CEP-I is considered overall positive. The missions concluded the EMF was implemented successfully - all submitted sub-projects have been preliminary assessed from environmental point of view, providing them an environmental category as well as requiring relevant environmental authorizations, licenses and permits. Furthermore, all approved sub-projects have relevant supporting EIA documents – Environmental Screening Checklist and/or simple Environmental Management Plan as well as if needed per national legislation – approvals from local

environmental authorities and from the State Ecological Expertise (SEE) along with the environmental permits and licenses.

The PIU Environmental Specialist will be in charge of overall coordination of implementation and reporting on the EMF, inspection of environmental compliance at worksites, advising PFIs and project participants on environmental questions, coordination the overall environmental monitoring at project level, and coordination of the agricultural extension program. The ES will be also responsible for assisting the PFIs in implementation of the access to finance component of the project, including reviewing environmental management plans, monitoring their implementation, advising and guiding PFIs on specific environmental issues and management options and ensuring that cumulative impacts are addressed. Furthermore, the ES will also be responsible in identifying training needs of the PFIs, ensure that environmental requirements are integrated into bidding documents for physical investments, and analyzing contracts and application in terms of environmental management and mitigation issues. Furthermore, he/she will provide training for ODIMM and MIEPO, specified above, as well as assist them in conducting matching grants EIA, providing also his/her inputs for the Matching Grants Operational Manual. The ES will periodically collect information on changes and impact of the project activities and will study the environmental condition of the project area and identify main environmental parameters.

The PFIs will play the major role in implementing EMF provisions and will be required to ensure that borrowers conduct an appropriate EIA and where necessary prepare an EMP, for each sub-project. The PFIs will be involved in the process of project implementation from the very beginning, at the project's appraisal stage. They will evaluate project proposals to attribute them to the WB Category and determines type of Environmental Assessment to be conducted for project, reviews the set of documents prepared by sub-borrowers (sub-projects' Information Sheet or Project Summary Sheet as well as all necessary permits and clearances needed for project implementation) completes Environmental Screening Checklist and makes a final decision on project's financing. In case of non-compliance with presumed mitigation measures during project implementation, the PFIs can make a decision on suspending of funding.

The sub-project EMPs implementation will remain under the direct responsibility of the PFIs, and of sub-borrowers, including responsibilities for supervision and monitoring of selected sub-projects. Compliance with the EMPs and monitoring of the impact during the construction phase will be undertaken by the PFIs and periodically by PIU Environmental Specialist as part of his contract supervisory duties.

The project Operational Manual that will be developed would set forth not only the criteria for the selection of recipients sub-loans, criteria for the eligible investments, terms and conditions of the sub-loan and other modalities and agreements of the access to finance, but also the rules and procedures for sub-projects EA that are in details provided in the EMF. It would also provide rules and procedures for EA of matching grants and issues to be considered while designing business development proposals oriented to expert. This document should be satisfactory to IDA and will be an effectiveness condition. The sub-project EMPs will be also integrated into the contracts for approved activities, both into specifications and bills of quantities and the contractors will be required to include the cost in their financial bids and grant proposals.

The EIA documentation for the first two Category B sub-projects from each participating PFI will be subject to prior review and approval by the PIU and World Bank. The project also will provide PFI capacity building activities prior to PFI approving of any sub-projects and would be completed before prior review by the World Bank ceased. During sub-project appraisal PFIs will have to ensure that proposed sub-projects are in compliance with all national environmental laws

and standards, as certified by the relevant local or national authorities of the country. All relevant documents and permits should be kept in each sub-borrower document file maintained by the PFI, and be made available for review by PIU and IDA representatives.

A training program targeting the PFIs, and other interested parties will be implemented in the framework of the Project's TA activities. The training program should be practical and include work with realistic case studies, based on actual loan proposals and types of business activities supported by the Project. It should also cover an explanation and practical application of the environmental standards and forms designed for use by the PFIs, covering the following issues: (a) national and World Bank requirements for environmental assessment; (b) screening and scoping procedures including checklists of potential environmental impacts of the agricultural production and agro-processing activities; (c) main provisions of environmental management plans for proposed sub projects, including mitigation and monitoring requirements. Field visit also may be included. Such training will enable the PFIs environmental officers to recognize and assess potential negative environmental impacts of the selected sub-projects and set of measures to mitigate them.

The implementation arrangements for LOC will remain same as under CEP-I project. The LOC will be administered through an apex arrangement. The apex is placed with the Credit Line Directorate (CLD) a specialized entity operating under the MoF. The CLD has ample experience with the Bank's lines of credit, and has also administered credit lines of a number of other international institutions. The CLD also has extensive expertise in application of Bank Safeguard policies (outside of CEP-I it has managed several other line of credits financed under World Bank's Sector Rural Investment and Services Project (RISP-2), and received adequate training to conduct screening of sub-loan applications for compliance with safeguards procedures.

The PIU will delegate the administration of the MGF to a matching grants administrator, as with CEP-I. ODIMM will administer the MGF, in line with MoE's wishes to increase its role and capacity and institutionalize the MGF. During the first year of implementation, the Project will support ODIMM to be prepared for this task through the provision of technical assistance, goods, and training for, inter alia: i) developing the matching grant manual; ii) designing the communication strategy; iii) conducting studies; and iv) defining the monitoring and evaluation strategy. Please, see the Sustainability section for a discussion of institutionalization.

6.2 Credit Line Directorate

The Credit Line Directorate (CLD) is the body consisting of representatives of the Ministry of Economy, Ministry of Finance and other relevant institutions, which is responsible for overall management of credits. The CLD is involved in the process of project implementation from the very beginning, at the project's appraisal stage. It evaluates project proposals to attribute them to the WB Category and determines type of Environmental Assessment to be conducted for project, reviews the set of documents prepared by sub-borrowers (sub-projects' Information Sheet or Project Summary Sheet as well as all necessary permits and clearances needed for project implementation) completes Environmental Screening Checklist and makes a final decision on project's financing. In case of non-compliance with presumed mitigatory measures during project implementation, the CLD can make a decision on suspending of funding.

6.3 Commercial Banks

The main function of commercial banks, which will be selected as PFIs in the project is administration of loans' processing. The banks will not have specially assigned people dealing with projects' environmental assessment and management because these institutions do not have relevant knowledge, or the official responsibility for environmental management and protection. All PFIs will mainly rely on the decisions of the CLD concerning the project category and on approvals, permits and certificates issued by the State Environmental Inspectorate under the Ministry of Environment as documents confirming that projects proposed for lending are environmentally sound and has in place all necessary EIA documentation. At the same time, as the PFIs will be responsible for assisting the sub borrowers in preparing the environmental screening form and respectively in identifying potential sub projects environmental issues, the EMF recommends that each participating PFI would designate a staff which would be trained on environmental issues to designated further environmental assessment responsibility.

6.4 Project Implementation Unit

The Project Implementation Unit (PIU) monitors the compliance with the Development Credit Agreement for the Project with regard to the environmental review process, including periodic monitoring of the matching grants and CLD's screening process of applications for EA requirements. The PIU aims also to assist the beneficiaries in all aspects and is responsible for reporting to both the Government and the World Bank.

The PIU staff will include an environmental officer who will review and verify applications for loan, and if approved, will monitor the activity to ensure its full compliance with the EMF. The role of the PIU Environmental Specialist will be two-fold: i) to provide assistance to each of the PFI loan officers and to PIA and CLD to determine the exact impacts that can be generated by proposed activities for which loans are being sought as well as prescribing in specific terms the required mitigative actions to be taken; and, ii) to monitor and report on a regular basis the effects on the environment that activities financed through PIU may provoke and to ensure that mitigation is carried out.

Environmental Specialist to be appointed by PIU would work under the supervision of PIU Executive Director as well as in close collaboration with relevant ME staff and other stakeholders including concerned NGOs. The specialist would provide guidance and backstopping to the CLD on projects' environmental screening procedures, and along with loan officers (to whom he/she would provide advice), will be responsible for ensuring an efficient screening of proposed sub-projects. The objective of the Environmental Specialist's task would be also raising awareness on environmental issues and strengthen capacity of project stakeholders toward ensuring that potential environmental impacts could be recognized, avoided or at least minimized through mitigation. In this regard among the tasks to be performed by Environmental Specialist would be: design the environmental training programs on national environmental legislation, World Bank Safeguard Policies, Environmental Impact Assessment, etc; prepare a reference manual for the lending staff of the PFI, which would include the list of national environmental legislation, list of economic activities requiring permits, compliance procedures and/or compliance inspections; deliver the training through a series of seminars to the target audience; conduct environmental monitoring and assessment. Besides, appointed Environmental Specialist would ensure that applicable national standards and guidelines are

being followed and achieved. Where multiple sub-projects are being carried out in geographical proximity, the specialist would assess the possible cumulative or residual effects on the environment (particularly, on natural habitats, forests, soil, and air and water resources).

Environmental Specialist has to meet the following qualification criteria: appropriate education in environmental sciences and some engineering skill; relevant knowledge of the current environmental situation in Moldova; high familiarity with environmental and other relevant to the fields policies and legislation; at least 5 years experience in the area of environmental management; knowledge of World Bank Safeguard Policies and EIA rules and procedures; experience with similar assignment would be an advantage; outstanding communicational, presentational and organizational abilities.

7. Training and Capacity Building

7.1 Training for PIU and PFIs

Based on the conducted analysis it was concluded in order to ensure successful implementation of the EMF requirements it is necessary to provide a series of capacity building activities. In particular, it is proposed the PIU Environmental Specialist should have training course on environmental monitoring techniques and procedures.

The PIU, CLD and PFIs staff will also require training on environmental management. A workshop 2 days duration would be designed and might involve about 15 participants. In the design of the training program, the Environmental Specialist has to take into account the following: (i) the training program should be practical and include work with realistic case studies, based on actual loan proposals and types of business activities supported by the Project; (ii) the training program should cover an explanation and practical application of the environmental standards and forms designed for use by the participating financial institutions.

A number of commercial banks will be given the responsibility for reviewing loan applications for agricultural, agro-processing and industrial development under the close monitoring of the PIU. The loan officers of these institutions will need to be familiar with environmental aspects of development projects and basics of environmental analysis. The basics of environmental analysis would include elements of environmental impact assessment procedures is to be focused: (i) on national and World Bank requirements for environmental assessment, mitigation, monitoring and reporting; (ii) screening and scoping procedures including checklists; (iii) the generic procedures for environmental assessment required by the World Bank and national authorities; (iv) content of management plan; (v) monitoring and reporting requirements of the World Bank for sub-project supervision. Field studies also may be included. Such training will enable these target groups to recognize and assess potential negative environmental impacts and set of measures to mitigate them.

Next the most critical group to be exposed to the importance of the environment concerns includes entrepreneurs from agricultural, agro-processing and manufacturing sectors who will be receiving the loan, and whom should be provided advices on use better available techniques to prevent/ mitigate impact and promote sustainable agriculture and clean industrial technologies. It may be included in the mandate of the environmental specialist that he/she would clearly point out the environmental consequences of various agricultural, agro-processing and manufacturing related activities. The workshops for this group would include environmental awareness and a practical exercise to observe and learn about sustainable agricultural practices and best available techniques in industry. Presumably, at least 2 workshops for 2 days are required with about 15 persons attending each workshop.

As a capacity building may be considered also the preparation of a user friendly Environmental Guidelines to be used main stakeholders. These Guidelines would have a dual purpose: i) would indicate how to identify sub-projects that may fall into one of the Bank's A or B environmental categories, and in which case will require a full and/or a partial EIA, and, ii) it would provide assistance for PIU, CLD and loan officers to identify activities that may affect the environment and in organizing the sub-projects EIAs.

7.2 Capacity building activities for Small&Medium Enterprise Development Agencies

In coordination with and under supervision of the PIU the Organization for the Development of Small and Medium Enterprises (ODIMM) and Moldovan Investment and Export Promotion Organization (MIEPO) will be responsible for implementation of the second project component (Small and Medium Enterprise Development). This component is targeted at improving the design, delivery mechanisms, and capacity to implement programs to facilitate SME development and exports, providing for this purpose matching grants.

The CEP-II project will be focused on strengthening capacity of these public institutions in providing of public goods and overcoming market failures. As these are new institutions with no expertise on environment, it was agreed with the project they will receive TA. This will be provided by the PIU Environmental Specialist which should have good knowledge and experience in applying WB environmental safeguards and environmental management. The focus of capacity building activities will be on the following: assessing any potential negative environmental or social impacts of the business development proposals, conducting matching grants environmental screening and impact assessment, creating and/or strengthening Environmental Management Systems (EMSs), as well as looking for opportunities to recommend environmentally and/or socially positive options (e.g., energy efficiency, recycling and reducing waste generation, etc.).

The target audience for the training program will include staff of the SMED agencies, staff of the PFI, and staff Credit Line Directorate.

In the design of the training program, the PIU Environmental Specialist has to take into account the following:

(i) the training program should be practical and include work with realistic case studies, based on actual loan proposals and types of business activities supported by the CEP project;
(ii) the training program should cover an explanation and practical application of the environmental standards and forms designed for use by the SMED agencies and PFI.

The major findings of the current EMF can be used as a background paper showing EIA procedures for screening and scoping phase, identification of significant impacts, development of mitigation and monitoring requirements.

8. EMF Monitoring

A permanent and regular monitoring by the Bank and PIU is required to ensure that mitigation measures are being implemented, to determine whether there are no additional environmental impacts, which were not identified or overlooked in the project's environmental assessment/ analysis. Monitoring of the environmental impacts within the implementation of the whole CEP can be performed through the country- or district-wide evaluation of impacts from the individual groups of sub-projects (CEP sub-categories) that will be funded under the Project. In order to monitor the overall CEP EMF implementation (through the monitoring and evaluation of financed sub-projects), there were proposed a set of environmental indicators. These indicators include: number of category B sub-projects; overall impact of the supported sub-projects; number of complains/ number of sentences/ number of ecological charges applied for the supported sub-projects; number of trainings and participated in capacity building activities. Based on these indicators the PIU semiannually would prepare short progress reports with regard to EMF implementation. Furthermore, the PIU will ensure annual publishing these reports on the project website as well as dissemination on environmental issues related to the CEP to all interested stakeholders and parties (e.g. NGOs, general public etc.).

9. Budget

At the project design stage, the amount of funds to be spent for preparing sub-projects Environmental Impact Assessments, obtaining of necessary permits and other relevant activities are the responsibilities of sub-borrowers. They will depend on the nature of project proposal, its complexity, scale, etc. At the construction and operation stages, the funds to be spent for installations and other activities to ensure mitigatory measures against the environmental impacts from sectoral activities is also the responsibility of sub-borrowers. These funds will depend on particular techniques and technologies used for implementing mitigation measures as well as on their scale, number, variety and other factors. At the same time, in order to ensure successful EMF implementation, a series of capacity building activities are necessary for which the project has to provide adequate funding. Estimated budget for proposed capacity building activities and trainings is presented in the *Table 14* below.

Table 14. Estimated budget for trainings

Training Required and Target Group	Purpose	No of participants / No of days for the workshop / No of workshops	Funds to be spent as per budget lines	Total funds
1. Environmental awareness workshop for PIU staff, CLD, PIA and loan officers	To ensure that PIU staff, CLD, PIA and loan officers aware about importance of the environment and know how to recognize the impacts that various funded activities may have on the environment.	15 / 2 / 1	1). Rent a room: $230 x 2 days = $460 2). Trainees fee: $200 x 2 days x 2 trainees = $800 3). Consumables/handouts: $12 x 15 pers. = $180 4). Rent of equipment: $70 x 2 days = $140 5). Coffee-breaks: $2 x 18 pers. x 4 breaks = $144 6). Lunches: $25 x 18 pers. x 2 lunches = $900	$2624
2. PIU Environment Specialist	To provide PIU ES with knowledge on the screening of the projects, EIA process and EIA review	1 / 2 / 1	1). Trainee fee: $200 x 2 days = $400 2). Consumables/ handouts: $12 x 1 pers. = $12 3). Coffee-breaks: $2 x 2 pers. x 4 breaks = $16 4). Lunches: $25 x 2 pers. x2 lunches = $100	$528
3. PIU Environmental Specialist and CLD	To provide PIU staff/ or PIU ES and CLD with knowledge on environmental monitoring techniques and procedures	1 / 4 / 1	1). Trainee fee: $200 x 1 day = $200 2). Consumables/ handouts:$12 x 4 pers. = $48 3). Coffee-breaks: $2 x 5 pers. x 2 breaks = $20 4). Lunches: $25 x 5 pers. x1 lunch = $250	$518
4. CLD, PIA and Loan officers from commercial banks	Familiarizing with environmental aspects of development projects and environmental analysis to enable them to recognize the potential negative environmental impacts and outline set of measures to mitigate impacts	10 / 2 / 2	1). Rent a room: $230 x 2 days x 2 workshops = $920 2). Trainees fee: $200 x 2 days x 2 trainees x 2 workshops = $1600 3). Consumables/ handouts: $12 x 10 pers. x 2 workshops = $240 4). Rent of equipment: $70 x 2 days x 2 workshops = $280 5). Coffee-breaks: $2 x 12 pers. x 4 breaks x 2 workshops = $192 6). Lunches: $25 x 12 pers. x 2 lunches x 2 workshops = $1200	$4492
5. Entrepreneurs/project beneficiaries	Environmental awareness and a practical exercise to observe and learn about sustainable agricultural practices and best available techniques and industry and agriculture	15 / 2 / 2	1). Rent a room: $230 x 2 days x 2 workshops = $920 2). Trainees fee: $200 x 2 days x 2 trainees x 2 workshops = $1600 3). Consumables/ handouts: $12 x 15 pers. x 2 workshops = $360 4). Rent of equipment: $70 x 2 days x 2 workshops = $280 5). Coffee-breaks: $2 x 18 pers. x 4 breaks x 2 workshops = $288 6). Lunches: $25 x 12 pers. x 2 lunches x 2 workshops = $1800	$5248
Sub-total for 7 trainings/workshops				**$13410**

10. Environmental Management Framework's Disclosure and Consultation

Draft Environmental Management Framework (EMF) disclosure occurred on March DD, 2014 by its posting on websites of the Ministry of Economy (www.mec.gov.md) and Regional Environmental Center (REC) Moldova (www.rec.md). REC has further forwarded electronically the EMF summary to all national and local environmental NGO's, and PIU - to the Ministry of Environment, Ministry of Economy, and Ministry of Finance.

Consultation on draft EMF took place on March DD, 2014 at premises of World Bank in Chisinau with participation of representatives of national NGO's, PIU, industrial enterprises and other target groups.

During the consultation, the Client has presented a summary of a draft Environmental Management Framework to public. Particularly, the audience was informed about screening of the projects, types of Environmental Impact Assessment for sub-projects, potential impacts which may by generated by agricultural production, agro-processing and manufacturing sectoral activities as well as measures to be taken to prevent/ mitigate potential impacts. The consultation meeting's attendees actively participated in discussions which were mainly focused on WB environmental screening procedure and capability of environmental authorities to perform monitoring of sub-projects.

After the meeting, on the basis of input from participants as well as electronically received comments from interested parties on summary of the draft EMF posted one week earlier on REC's and other websites, there were made relevant corrections both in the main text of EMF and annexes to EMF to fully meet stakeholders' concern. The Report on Consultation on the Draft EMF with interested parties is presented in *Annex J.*

Final version of the Environmental Management Framework approved by World Bank is to be posted on World Bank's InfoShop for its disclosure as well as on websites of the Regional Environmental Center (REC) Moldova and the Ministry of Economy.

Annexes

Annex A. Environmental Screening Checklist
Annex B. Content of the Environmental Management Plan
Annex C. Environmental Screening Checklist for existing facilities
Annex D. Environmental Audit Protocol Outline for existing facilities
Annex E. Impacts, Causes, Consequences and Mitigation measures for sub-projects in Agricultural Production Sector
Annex F. Impacts, Causes, Consequences and Mitigation measures for sub-projects in Agro-processing & Food production Sectors
Annex G. Impacts, Causes, Consequences and Mitigation measures for Contraction activities & sub-projects in Manufacturing Sector
Annex H. Recommended Structure of a Pest Management Plan
Annex I. Reference Documents for World Bank Operational Policies (OP) and Bank Procedures (BP)
Annex J. Report on Consultation on the Draft EMF with interested parties.

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 emmissions?			
Will the project generate specific air pollution (dioxins, furans, etc)			
Aquatic environment			
Water Quantiy: 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?			
Degradation of natural aquatic ecosystems			
Weeds, pests, diseases: will the project contribute to spreading of weeds, pests and animal and plant diseases?			

Environmental Component	Construction Phase	Operational Phase	Mitigation Measures
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 sawn 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 recicling 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 5) Use natural meadows and grasslands rather for mowing than grazing 4) Inform personnel about importance of adjacent environmentally important area, if any, etc.

Environmental Component	Mitigation Measures
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 sawing (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) To execute strict primary and secondary control of air emissions, etc.
Aquatic Ecosystems	
Water Quantiy: 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 3) Where possible, to renovate existing sewerage system/ ensure

Environmental Component	Mitigation Measures
	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 spaying 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
(version 1)
(to be completed by the PIA/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
(version 2)
(to be completed by the PIA/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	[ ] Yes [ ] No	See Section **B** below
	B. New construction	[ ] Yes [ ] No	See Section **B** below
	C. Individual wastewater treatment system	[ ] Yes [ ] No	See Section **C** below
	D. Historic building(s) and districts	[ ] Yes [ ] No	See Section **D** below
	E. Acquisition of land[6]	[ ] Yes [ ] No	See Section **E** below
	F. Hazardous or toxic materials[7]	[ ] Yes [ ] No	See Section **F** below
	G. Impacts on forests and/or protected areas	[ ] Yes [ ] No	See Section **G** below
	H. Handling / management of medical waste	[ ] Yes [ ] No	See Section **H** below
	I. Traffic and Pedestrian Safety	[ ] Yes [ ] 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 (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	

[6] 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
[7] Toxic / hazardous material includes and is not limited to asbestos, toxic paints, removal of lead paint, etc.

	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
G. Affects forests and/or protected areas	Protection	(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 tress 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	(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: ▪ 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	(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 ▪ 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 Management Plan

Annex B / Form 1

ENVIRONMENTAL MANAGEMENT PLAN CONTENT

Part 1

General Remarks. Environmental Management Plan (EMP) for the Category A projects should outline the mitigation, monitoring and administrative measures to be taken during project implementation to avoid or eliminate negative environmental impacts. For projects of intermediate environmental risk (Category B projects), EMP may also be an effective way of summarizing the activities needed to achieve effective mitigation of negative environmental impacts (**description of Environmental Management Plan** is provided in **Annex B/Form 1** below).

The Management Plan format provided in **Annex B/Form 2** below. It represents a model for development of an EMP. The model divides the project cycle into three phases: construction, operation and decommissioning. For each phase, the preparation team identifies any significant environmental impacts that are anticipated based on the analysis done in the context of preparing an environmental assessment. For each impact, mitigation measures are to be identified and listed. Estimates are made of the cost of mitigation actions broken down by estimates for installation (investment cost) and operation (recurrent cost). The EMP format also provides for the identification of institutional responsibilities for "installation" and operation of mitigation devices and methods.

To keep track of the requirements, responsibilities and costs for monitoring the implementation of environmental mitigation identified in the analysis included in an environmental assessment for Category A or B projects, a monitoring plan may be useful. A **Monitoring Plan format** is provided in **Annex B/ Form 3** below. Like the EMP the project cycle is broken down into three phases (construction, operation and decommissioning). The format also includes a row for baseline information that is critical to achieving reliable and credible monitoring. The key elements of the matrix are:

- What is being monitored?
- Where is monitoring done?
- How is the parameter to be monitored to ensure meaningful comparisons?
- When or how frequently is monitoring necessary or most effective?
- Why is the parameter being monitored (what does it tell us about environmental impact)?

In addition to these questions, it is useful to identify the costs associated with monitoring (both investment and recurrent) and the institutional responsibilities.

When a monitoring plan is developed and put in place in the context of project implementation, the PIU will request reports at appropriate intervals and include the findings in its periodic reporting to the World Bank and make the findings available to Bank staff during supervision missions.

Annex B / Form 1

ENVIRONMENTAL MANAGEMENT PLAN CONTENT

Part 2
Description of the of the Environmental Management Plan

The Environmental Management Plan (EMP) identifies feasible and cost-effective measures that may reduce potentially significant adverse environmental impacts to acceptable levels. The plan includes compensatory measures if mitigation measures are not feasible, cost-effective, or sufficient. Specifically, the EMP (a) identifies and summarizes all anticipated significant adverse environmental impacts (including those involving indigenous people or involuntary resettlement); (b) 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; (c) estimates any potential environmental impacts of these measures; and (d) provides linkage with any other mitigation plans (e.g., for involuntary resettlement, indigenous peoples, or cultural property) required for the project.

Monitoring

3. Environmental monitoring during project implementation provides information about key environmental aspects of the project, particularly the environmental impacts of the project and the effectiveness of mitigation measures. Such information enables the borrower and the Bank to evaluate the success of mitigation as part of project supervision, and allows corrective action to be taken when needed. Therefore, the EMP identifies monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed in the EA report and the mitigation measures described in the EMP. Specifically, the monitoring section of the EMP 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.

Capacity Development and Training

4. To support timely and effective implementation of environmental project components and mitigation measures, the EMP draws on the EA's assessment of the existence, role, and capability of environmental units on site or at the agency and ministry level.[3] If necessary, the EMP recommends the establishment or expansion of such units, and the training of staff, to allow implementation of EA recommendations. Specifically, the EMP provides a specific description of institutional arrangements-who is responsible for carrying out the mitigatory and monitoring measures (e.g., for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training). To strengthen environmental management capability in the agencies responsible for implementation, most EMPs cover one or more of the following additional topics: (a) technical assistance programs, (b) procurement of equipment and supplies, and (c) organizational changes.

Implementation Schedule and Cost Estimates

5. For all three aspects (mitigation, monitoring, and capacity development), the EMP 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 EMP. These figures are also integrated into the total project cost tables.

Integration of EMP with Project

6. 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 EMP will be executed effectively. Consequently, the Bank expects the plan to be specific in its description of the individual mitigation and monitoring measures and its assignment of institutional responsibilities, and it must be integrated into the project's overall planning, design, budget, and implementation. Such integration is achieved by establishing the EMP within the project so that the plan will receive funding and supervision along with the other components.

Resource: OP 4.01, Annex C - Environmental Management Plan.
http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTOPMANUAL

Annex B / Form 2

ENVIRONMENTAL MANAGEMENT PLAN CONTENT

Environmental Management Plan Format

Phase	Environmental Impact	Mitigating Measure(s)	Cost		Institutional Responsibility		Remarks
			Install	Operate	Install	Operate	
Construction	• • • •	• • • •					
Operation	• • • •	• • • •					
Decommissioning	• • • •	• • • •					

Annex B / Form 3

ENVIRONMENTAL MANAGEMENT PLAN CONTENT

Environmental 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**	
						Install	**Operate**	**Install**	**Operate**
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** *(row 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 PIA/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, Polices 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
• Waste Feed	Livestock feed includes hay, grain and silage. 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		To maximize the efficiency of the operation and minimize wasted feed	
• Animal Waste		Migration of contaminants to and pollution of surface water, groundwater and air	- 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	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 Ensure that manure is applied to agricultural land only during periods that are appropriate for its use as plant

Table E-1. Mammalian livestock production				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
Animal Carcasses	Mammalian meet processing		-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	nutrient (generally just before the start of the growing season) Animal carcasses should be properly managed and quickly disposed to prevent the spread of odors
Contribution to surface and underground water pollution/ Wastewater	Livestock operations generate on-point source Some facilities may also include point sources which typically require collection and treatment prior to final discharge	Effluents due to runoff from livestock housing, feeding, and watering, waste management facilities, and areas of land application of manure	To reduce discharges to surface water and groundwater from mammalian livestock operations: - 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	Techniques for treating industrial process wastewater in this sector include: - 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. form feed storage, loading, and unloading)	Ammonia gas has a sharp and pungent odor can act as an irritant when present in high enough concentrations.	- 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**
• 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; - 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) *inter alia* 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 s 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 • Environmental damage	Livestock access to creeks, rivers, and other natural water sources;	Contaminating the water with animal waste, destroying riparian habitat, eroding the stream banks	- Prevent animals' access to surface water bodies using fences, buffer strips or other physical barriers;	
• Overgrazing	Alteration of the vegetation composition and associated organisms in rangelands	Soil losses and a reduction in soil productivity	-Prevent overgrazing of pastureland through use of: 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; - Use of stabling; - Not to pasture in early spring and late autumn; - Use of livestock trails to reduce soil trampling and gully formation	
• Soil erosion				

Table E-1. Mammalian livestock production				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
• 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**
	sludge from on-site wastewater treatment. Other wastes include various kinds of packaging, used cleaning materials, etc.			
• Waste Feed	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	Contamination of storm water runoff, primarily due to organic matter content	- 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	
• Animal Waste	Manure contains ammonia, nitrogen, phosphorus, and other excreted substances such as hormones, antibiotics, and heavy metals, as well as bacteria and pathogens	Air emissions of ammonia and other gases - a potential risk of contamination to surface or groundwater resources through leaching and runoff Pollution soil, water and food resources	- 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; - Locate manure piles away from water bodies, - Check for leakage regularly (e.g. inspect tanks for corrosion	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

Table E-2. Poultry production				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
• . Poultry Carcasses			of seams), - Place dry manure or litter in a covered or roofed area; Poultry carcasses should be properly and quickly managed as they are a significant source of disease and odors, and can attract vectors. - 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	-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: - 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**
• 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 euthrophication. Release of ammonia gas also reduces the nitrogen content and, therefore, the fertilizer value of the manure	- 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	- 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; - Consider covering manure piles	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**
			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	To minimize the potential for the spread of poultry pathogens: - 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	- Select crops compatible with water availability in the area; - Maximize the use of available precipitation ("rain harvesting"), where feasible, by: 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: - 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 excessively heavy equipment;	

Table E-3. Annual crop production & plantation crop production				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
			- 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	The preference should be given to alternative pest management strategies, with the use of synthetic chemical pesticides as a last option. ***Pesticide Application*** If pesticide application is warranted, then the following measures are recommended: -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; - Establish untreated buffer	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**
			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	- 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	- 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		-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.		-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	- 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	- 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	If there is not enough clay, then the ponds may demonstrate high seepage rates and require additional expenditure or eventual abandonment. High seepage rates can also pollute groundwater required for other purposes in the vicinity with use for drinking water a major concern
Soil Erosion and Sedimentation	Pond-based aquaculture system	Affect aquatic systems during construction activities, primarily the mobilization of soils and sediments	- 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	

Table E-4. Aquaculture				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
			during construction; - 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				
Threats to biodiversity	- Construction project cycle of an aquaculture facility	- Alteration of aquatic habitats and substrates	- Ensure that the area to be used for aquaculture does not represent a habitat that is sensitive areas	
• loss of genetic resources	- 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		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	
• Introduction of alien species	Interactions with the wild	Introductions can disturb the existing ecological balance; cause loss of species	- Farming of sterile fish; - Preventing the escape of species from pond-based	The widespread seeding of an alien genotype is of considerable concern both as

Table E-4. Aquaculture				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
		biodiversity; cause loss of genetic diversity of the wild populations; reduce fitness of wild population through breeding with genetically altered escapees; and result in the transmission or spread of fish diseases	aquaculture systems; - When necessary, consider 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	regards species biodiversity and genetic biodiversity
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 euthrophication 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	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

Table E-4. Aquaculture				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
			a number of days before discharge, or transfer to a separate treatment facility. -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	effluent before its release into the receiving waters to reduce contaminant levels. 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); - 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	Genetic drift into other areas where GMOs are not wanted	- Use certified crop seeds that do not contain seeds from invasive alien species; -The introduction of GMO	

Table E-5. Seeds				
Potential Impacts	**Causes**	**Consequences**	**Mitigation/prevention required**	**Remarks**
	increased pest resistance. Another concern related to the introduction or export of plants and plant products is the potential for introduction of pests		crops should be assessed for compliance with the existing host country regulatory 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	Increased healthcare costs; lost	Proper handling and use of	

Table E-8. Pesticides application*				
Significance of Overall Potential Impact: HIGH (cumulative impact)				
Potential Impacts	**Causes**	**Consequences**	**Mitigation Required**	**Remark**
	and storage of pesticides. Consumption of crops with high levels of pesticide residues	work time; lost family income.	pesticides; 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	Good practices to be carried out by equipment operators Agricultural machinery should	This is a minor impact and awareness to operators to refuel under safe conditions is

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**
		quality	be kept in good conditions Fuels and lubricants are to be stored and handled in devoted areas, etc.	all that would be required.
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 lublicants	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 lublicants	
			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**

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 lubricants and improper handling of fuels and lubricants Leachate of fuel and lubricants into groundwater and surface runoff to water bodies	Pollution of ground and surface water results in deterioration surface water used for drinking water supply, affects aquatic ecosystems & associated biodiversity	Construction to include 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 containing hormones, antibiotics and other chemicals	Lost job & and income	Use of organic methods of livestock husbandry; Minimal application of only indeed necessary drugs	Only approved drugs and 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 & meet 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	***Poultry:*** the carcass yield is, on average, 75% of the live bird weight ***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)	***Poultry:*** Provision of adequate slurry storage capacity for excreta until it is transported for disposal or for use as agricultural fertilizer ***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	
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.	***Poultry***: Birds must be stored separately to avoid contact with healthy birds - 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 & meet processing				
Overall Potential Impact: HIGH (due to human health threat)				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
Livestock: bovine spongiform encephalopathy (BSE), etc.			***Livestock:*** 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^{o}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 meet processing operators	Surface water, groundwater and soil pollution	***Poultry:*** - Reuse of high-quality, low risk by-products; - Disposal of fat at landfills if it can not be used for biogas production ***Livestock:*** -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	***Poultry*** processing activities ***Meet*** process activities	***Poultry & Meet:*** Effluents with high content of organic matter, nitrogen, phosphorus, residues of chemicals, pathogens	***Poultry:*** - 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 ***Meet:*** - 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	- Optimizing water consumption for rinsing and cooling without jeopardizing food safety; -Prefer a dry cleaning process areas before cleaning with water	

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**
Air pollution/ Air emissions • Odor • Dust	Poultry & meet processing ***Meet:*** singeing, scalding, lairage, wastewater treatment and rendering	 ***Meet:*** Odor may often be the most significant form of air pollution	***Poultry:*** -Maintenance of clean live bird handling areas by removing fecal matter and dead birds on a daily basis; -Reducing the inventory of raw carcasses, waste, and byproducts and minimizing any storage to short periods of time in a cold, closed, well-ventilated area. - Dead birds, waste, and byproducts should not be stored in open spaces, where possible ***Meet:*** -Consider the location of new facilities, taking into account proper distances to neighbors and the propagation of odors; Pasteurize organic material before processing it to halt biological processes that generate odor; -Clean pens and livestock yards on a timely basis; -Empty and clean fat traps frequently ***Meet:*** -Clean and maintain a sufficient level of humidity in pens and livestock yards; Reduce fugitive dust by minimizing surface areas with exposed soil surfaces, and by planting hedges or erecting fences to minimize wind turbulence, etc.	

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 Meet 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 re.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				*For sites with more than one activity to minimise consumption and emission levels the BAT* is *for slaughterhouses* to have processing plants and meat poultry cutting plants on the same site
Residual Impact Assuming Full Mitigation: LOW; Environmental Risk: MODERATE				

Table F-3. Poultry & meat packing (this activity is often combined with a Poultry and Meet 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	Consumers become ill; lost work days; lost productivity and income;	Provision of protective clothing; effective use of disinfectants; effective sanitary	

Table F-3. Poultry & meat packing (this activity is often combined with a Poultry and Meet Processing)				
Overall Potential Impact: HIGH (due to threat to human health threat)				
Potential Impacts	**Causes**	**Consequences**	**Mitigation Required**	**Remarks**
	maintenance; processing of contaminated meat from slaughter-house	Meat packing enterprise loses reputation resulting in lost sales, lost revenue and loss of job	inspections leading to required standards being met; effective 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)	Significant organic content, high salinity levels; other	To prevent contamination of wastewater:	

Table F-4. Dairy				
Overall Potential Impact: HIGH (primarily due to human health threat)				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
	Salting activities during cheese	pollutants: acids, alkali, and detergents, etc. as well as pathogenic microorganisms and viruses	-Avoid milk, product, and by-product losses; -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 • Dust • Odor	Dairy processing activities Dairy processing facilities are related to on-site wastewater treatment facilities,	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	

Table F-4. Dairy				
Overall Potential Impact: HIGH (primarily due to human health threat)				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
	in addition to fugitive odor emissions from filling/emptying milk tankers and storage silos		anticipated wastewater load; - Keep all working and storage 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		-Use uncontaminated sludge and effluent from on-site wastewater treatment as fertilizer in agricultural applications; -Dispose of contaminated sludge from wastewater treatment at a	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-

Table F-5. Vegetable oil processing				
Overall Potential Impact: LOW				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
	process include soap stock and spent acids from chemical 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		sanitary landfill or by incineration. - 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)	products
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		-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	Stress on water resources	- When economically viable, consider the use of physical refining instead of chemical refining to reduce water	

Table F-5. Vegetable oil processing				
Overall Potential Impact: LOW				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
	neutralization processes, and subsequent washing and deodorization		consumption; - Recover condensate from heating processes and reuse; - Close the cooling water circuit and re-circulate cooling waters	
Air pollution/ Air Emissions • Particulate matter	Vegetable oil processing Dust: - from processing of raw materials, including cleaning, screening, and crushing	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	
• Volatile Organic Compounds (VOCs)	Use of oil-extractionsolvents, normally hexane		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.	
• Exhaust Gases				
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.	

Table F-5. Vegetable oil processing				
Overall Potential Impact: LOW				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
			hard hats); protective guards on all machinery.	
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		- 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,		- Reduce the organic load of wastewater by preventing the entry of solid wastes and concentrated liquids into the wastewater stream: o Implement dry pre-cleaning of raw material, equipment, and production areas before wet cleaning o Allow beet to dry on field if	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

Table F-6. Sugar manufacturing				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
	and pathogens		possible, o Prevent direct runoff to watercourses, especially from tank overflows Application of water saving technologies, where possible	by aerobic treatment, for reduction of soluble organic matter, etc.
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		
Air pollution/ Air emissions	- 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		***Particulate Matter and Dust***: - 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 ***Odor:*** - 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	

Table F-6. Sugar manufacturing				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
			carbonation section is emitted from a stack of sufficient height	
Energy Consumption	Sugar manufacturing facilities use energy to heat water and produce steam for process applications and cleaning purposes	Stress on water and other natural resources	Industry specific measures: - 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	Reducing energy consumption 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	Raw materials 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 Where meat products are the raw material, solid waste generated during processing	Environmental pollution	- 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	

Table F-7. Food and beverage processing				
Overall Potential Impact: LOW				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
	may include organic materials that have the potential to significantly impact food safety due to the proliferation of pathogenic microorganisms		grading or cutting activities, and encourage the most productive employees to train others in 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	Stress on water resources	- Minimize water consumed during production processes: o Optimize product conveying	

Table F-7. Food and beverage processing				
Overall Potential Impact: LOW				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
	materials using water, cooling of blanched foods, and general equipment cleansing		systems to reduce contact of raw material and product with water; - Optimize process line operations to avoid spills of raw materials and water, reducing the need to wastewater treatment and associated energy consumption; - Reuse water streams in the production processes to the maximum extent possible while avoiding water contamination or compromising food safety: 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	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	

Table F-7. Food and beverage processing				
Overall Potential Impact: LOW				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
			areas or in containers, when climate conditions and plant design allow	
Air pollution/ Air Emissions • Particulate matter	Particulate matter may arise from solids handling, solid reduction and drying.		To prevent and control *particulate matter* emissions: - 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;	
• Odor	Odor may be released by thermal processing steps such as steam peeling, blanching and dehydrating and by microbial action in stored solid waste. In meat processing, odor may also be emitted from cooking and smoking activities		To prevent and control point source *odor* emissions: - 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	- 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: 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 megajoules 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	- 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

Table F-8. Breweries				
Overall Potential Impact: LOW				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
Contribution to surface water pollution/ Wastewater			To reduce organic load: - Undertake procedural improvements to reduce the 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 dust emissions are the use and storage of grains & sugar		To reduce *odor* emissions from wort boiling Dust generated from the unloading of raw materials and transport of malt and adjuncts	Dust arising from malt and adjuncts may be used as animal feed

Table F-8. Breweries				
Overall Potential Impact: LOW				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
			should be conveyed to the mash or adjunct kettle and the extract recovered	
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	Consumers become ill; lost work days; lost productivity and income; enterprise's	Provision of protective clothing; proper washing up with disinfectants; effective	

Table F-10. Frozen food production				
Overall Potential Impact: MODERATE (primarily due to human health threat)				
Potential Impacts	**Causes**	**Consequences**	**Mitigation Required**	**Remarks**
	maintenance; contaminated raw materials	reputation leads to lost business	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.	Lost 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) Unrefrigerated meat and dairy products.	Spreading of disease resulting in lost workdays, sales and income Lost labor efficiency and income	Regular inspection of markets and extermination of vermin; maintenance of high sanitary standards; Refrigeration of meat and dairy products	Market stall keepers in Bishkek mention presence of rats due to unsanitary conditions.
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 particlG-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, odour 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 *modus operandi*) 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.	Unsightly 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 (topsoiled 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 • 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**
○ Dust Other Air Pollutants • Combustion by-products • Toxic and nontoxic gases • NO_2, 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	Al 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**
• Vibration	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 Mainly blasting activities; crushers and plant screening equipment; minor emissions are commonly associated with use of rock hammers		containments -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 -Vibration and overpressure control with appropriate drilling grids; -Development of blast design, including a blasting-surfaces survey, to avoid overconfined charges	
Land conversion	Excavation activities at construction materials extraction sites	Topographical and land-cover changes; clearing of preexisting vegetation	-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.	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**
			--Hydrological systems should 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	- 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)	-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	

Table G-3. Cement and lime manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
			bag filling and handling systems to the extent possible · Using electrostatic precipitators (ESPs) or fabric filter systems (baghouses) 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, optimising energy efficiency in the design of the installation, unit or system and in the selection of processes for existing systems, optimising 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	

Table G-3. Cement and lime manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
			operation for specific pieces of 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 • Particulate matter • SO_2 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;	

Table G-4. Ceramics manufacturing				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
			- Dewatering and disposal of 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	***BATs to reduce solid process losses/solid waste*** -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 optimised 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 neighbours -Sound insulation of windows	

Table G-4. Ceramics manufacturing				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
			and walls -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 • Particulate matter • Dust • NO_2 • Greenhouse gas (CO_2) emissions • SO_2 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	In general, emissions to the water environment are

Table G-5. Glass manufacturing				
Overall Potential Impact: LOW				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
			for suspended solids reduction using settling basins - Dewatering and disposal of residuals in landfills, or if hazardous in designated hazardous waste disposal sites	relatively low and there are 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	Pretreatment, dyeing, and	Environmental pollution	- Potentially hazardous	

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**
• Chemical Selection and Use	other processes to provide the final product with desired visual and functional properties		surfactants should be replaced 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	Damage to environment and	-Use of emissions control	

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**
• Dust • Volatile Organic Compounds and other chemicals	operations, include drying, printing, fabric preparation and wastewater treatment residues Bale breakers, automatic feeders, separators and openers, mechanical conveyors, pickers and cards Stenter frames, which are used in drying.	human health	techniques (e.g. absorption and 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	Damage to environment	-Solid and liquid wastes should be effectively recycled or reused within the process or	

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**
	fabrics, spent dyes, pigments, printing pastes		externally -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 beamhouse, the tanyard, 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 utilise 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,	

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**
			followed by wet scrubbing; - 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 form 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 optimising 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**

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, 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 barelands, 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

Table G-8. Soap and detergent manufacturing				
Overall Potential Impact: MODERATE				
Potential Impacts	**Causes**	**Consequences**	**Mitigation Required**	**Remarks**
				counties are 100% used P-free detergents; these are Germany, Austria, Luxemburg, Italy, Ireland, 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	- 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		- To minimize the generation of wastewater:: - Use of water-developed films and water-developed plates; -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

Table G-9. Printing				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
Soil and underground water pollution / Wastes	Waste generation		-Reduction in the generation of hazardous and nonhazardous waste Appropriate management of hazardous wastes: handling, disposal, neutralization	
Energy consumption	Printing process	Stress on natural resources	-Minimise energy consumption when optimising 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.		- 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	The use of modern equipment and trained staff may increase conversion efficiencies to 70 percent Conversion efficiencies from roundwood to sawn lumber are often below 40 percent

Table G-10. Sawmilling and manufactured wood products				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
			-Maximum waste recycling: - Use of wood and bark chips as mulch for gardens and agriculture; - Use of sawdust and wood shavings for animal bedding; etc.	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.
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		Measures, specific to wood preservative treatment facilities: -Storage tanks and components	Containing copper oxide and quaternary ammonium, Copper Azole and Borates

Table G-10. Sawmilling and manufactured wood products				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
	or the coating of products may store large volumes of hazardous chemicals such as wood preservatives, paints, lacquers, and solvents.		should meet relevant standards for design and operational performance; -Chemical storage and treatment sites and tanks should be situated in containment areas, etc.	may be used in dry situations, in addition to alternative building materials
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		- 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	- To prevent and control leaching; -Biological treatment for reduction of BOD;	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**
			- Dewatering and disposal of residuals in designated waste landfills	
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	Pharmaceuticals and biotechnology manufacturing facilities; milling, mixing,	Threat to human health, damage to environment	-Reducing or substituting the use of solvents and other materials which have a high VOC content,	

Table G-12. Pharmaceuticals and biotechnology manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
particulates)	compounding, formulation, tableting, and packaging		-Implementation of VOC leak prevention and control strategies from operating equipment; -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, biodegradability, 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	

Table G-12. Pharmaceuticals and biotechnology manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
			limited natural water resource	
Solid and Hazardous Wastes	Chemical synthesis processing generates wastes containing spent solvents, reactants, spent acids, bases, aqueous or solvent liquors, still bottoms, cyanides and metal wastes. Fermentation: spent solids, intermediates, residual products		-Waste reduction by material substitution; -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 (bioprospecting), 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 bioprospecting 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
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: .-Process chemicals storage areas should be regularly checked to identify leaks; .-Waste spill containment trays should be used .-Metal-bearing sludges 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 scrammed 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	Damage to aquatic environment	The most commonly used systems include a combination	End of pipe wastewater treatment technologies will

Table G-14. Pulp and paper mills manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
	contaminated by suspended solids, BOD, COD, dissolved organic compounds and other hazardous substances		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	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, minimising 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 minimise electrical losses in the supply system as well as to reduce heat losses from heated processes To minimise water usage	
Raw material	Processing	Damage to environment	- To minimise material losses by retaining raw materials in process vats and at the same time minimise 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, minimising 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				

Table G-16. Metal, plastic and rubber products manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
Air pollution/ Air Emissions (dust, metals, etc)	Processing (sintering may 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).	Damage to environment & threat to human health	-Installation of refrigerator coils (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		-If reuse or recycling is not possible, the waste should be treated as hazardous wastes and	

Table G-16. Metal, plastic and rubber products manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
	quantity of metal chips (scrap metal), etc.		disposed and neutralized 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 (TTS), 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	Rubber products processing	Threat to human health &	-Use of chemicals in small, pre-	

Table G-16. Metal, plastic and rubber products manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
(particulate matter, dust, VOC)	(emissions of VOC and hazardous pollutants may be generated from used solvents)	damage to environment	weighed, sealed bags to limit dust generation; -Emissions from the internal 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, calendering, and extruding may be a t 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;	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

Table G-16. Metal, plastic and rubber products manufacturing				
Overall Potential Impact: HIGH				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
			-If reuse or recycling is not possible, the waste rubber should be disposed properly	
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	- 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 dedusting 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: - Use of induction furnaces, where possible; - Use of open hearth furnaces is no longer considered good practice for steel smelting and should be avoided

Table G-17. Foundries				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
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 sludges	Damage to environment	- Maximization of ***sand*** 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: o Lower metal melting temperatures o Optimizing use of fluxes and refractory lining	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 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 dedusting systems		- 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 stormwater 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	Threat to human health/ hearing loss (hypoxia)	- Enclose the process buildings and/or insulate them; - Cover and enclose scrap storage and handling areas, - Enclose fans and insulate ventilation pipes;	

Table G-17. Foundries				
Overall Potential Impact: MODERATE				
Environmental issues/ impacts	**Sources/ causes**	**Consequences**	**Prevention/ mitigation required**	**Remarks**
	transportation and ventilation systems		- Implement management controls, including limitation of scrap handling and transport during nighttime	
Residual Impact Assuming Full Mitigation: LOW; Risk: MODERATE				

Annex H. 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 itself, 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 address 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 indicated 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 are 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 I. Reference Documents for World Bank Operational Policies (OP) and Bank Procedures (BP)

OP 4.01 Environmental Assessment
http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/9367A2A9D9DAEED38525672C007D0972?OpenDocument

BP 4.01 Environmental Assessment
http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/C4241D657823FD818525672C007D096E?OpenDocument

OP 4.04 Natural Habitats
http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/71432937FA0B753F8525672C007D07AA?OpenDocument

BP. 4.04 Natural Habitats
http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/62B0042EF3FBA64D8525672C007D0773?OpenDocument

OP 4.09 Pest Management
http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/665DA6CA847982168525672C007D07A3?OpenDocument

OP 4.11 Cultural Property
http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/55FA484A98BC2E68852567CC005BCBDB?OpenDocument

OP 4.12 Involuntary Resettlement
http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/CA2D01A4D1BDF58085256B19008197F6?OpenDocument

BP 4.12 Involuntary Resettlement
http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/19036F316CAFA52685256B190080B90A?OpenDocument

OD 4.20 Indigenous Peoples
http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/0F7D6F3F04DD70398525672C007D08ED?OpenDocument

OP 4.36 Forests
http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/C972D5438F4D1FB78525672C007D077A?OpenDocument

BP 4.36 Forests
http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/0AE075DC916559D985256C79000BDEF0?OpenDocument

OP 4.37 Safety of Dams
http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/C12766B6C9D109548525672C007D07B9?OpenDocument

BP 4.37 Safety of Dams
http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/D3448207C94C92628525672C007D0733?OpenDocument

OP 4.76 Tobacco
http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/DBE1A283D3BF9D078525672C007D075E?OpenDocument

OP 7.50 Projects on International Waterways
http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/5F511C57E7F3A3DD8525672C007D07A2?OpenDocument

BP 7.50 Projects on International Waterways
http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/47D35C1186367F338525672C007D07AE?OpenDocument

OP 7.60 Projects in Disputed Areas
http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/72CC6840FC533D508525672C007D076B?OpenDocument

BP 7.60 Projects in Disputed Areas
http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/5DB8B30312AD33108525672C007D0788?OpenDocument

Annex J. Report on Consultation on the Draft EMF with Interested Parties

Date: March DD, 2014
Venue: World Bank Country Office, Chisinau

Location/venue	Objective	Invitees	Participants	Summary, conclusions and comments
Chisinau, World Bank office	To introduce the CEP-II credit line, 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: ′ Commercial banks, ′ Ministry of Environment, ′ Ministry of Economy, ′ Ministry of Finance, ′ Ministry of Regional Development, ′ Regional Environmental Center (REC) Moldova (further, REC has forwarded electronically the invitation to all local and national environmental NGOs).	1. 2. 3.	On the meeting, there were made presentations on: Competitiveness Enhancement Project including its New Line of Credit component, and Environmental Management Framework for the for the New Line of Credit component. The attendees actively participated in discussions which were mainly focused on the Bank's environmental screening procedure and capability of environmental authorities to perform monitoring of sub-projects. After the meeting, on the basis of input from participants as well as electronically received comments from interested parties on Summary Draft EMP posted one week earlier on REC and other websites, there were made relevant corrections both in the EMF main text and EMF Annexes to better meet stakeholders' concern.

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