GUIDELINES FOR ENVIRONMENTAL AND SOCIAL PERFORMANCE

STANDARD 3: RESOURCE EFFICIENCY AND POLLUTION PREVENTION

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The development of the Guidelines for the Environmental and Social Policy Framework was coordinated by Iván Besserer, under the guidance of Joseph Milewski, Unit Chief of the Environmental and Social Solutions Unit, and Oscar Came, Operations Manager.

The Guidelines were prepared by Alberto Villalba; Alessandro Sidore; Alvaro Adam; Andrea Gaviano; Daniela Zuloaga; Iván Besserer; Juan Martinez; Juan Carlos Vásquez; Julia Miguez; Julio Rojas; Maria Amelia Viteri; Maricarmen Esquivel; Melissa Barandiaran; Natasha Ward; Patricia Diaz; Patricia Henriquez; Pilar Larreamendy; Robert Langstroth; Roberto Leal; Soraya Senosier; Ute Reisinger; and Zachary Hurwitz. Special thanks to Bilal Rahill and Motoko Aizawa for their support during the preparation process. Thanks also to Joaquin Espinoza and Oscar Castillo for their assistance on different tasks during the preparation process.

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Environmental and Social Solutions Unit (ESG)

Inter-American Development Bank

1300 New York Ave, NW, Washington, D.C. 20577

E-mail: bid-mpas@iadb.org | Website: https://www.iadb.org/en/mpas

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IDB

INTRODUCTION

The following Guidelines correspond to Environmental and Social Performance Standard 3 which, together with the other nine Environmental and Social Performance Standards (ESPS) and the Policy Statement, make up the IDB's *Environmental and Social Policy Framework* (ESPF). The ESPSs are:

Assessment and Management of Environment and Social Risks and Impacts

Community Health, Safety, and Security

Land Acquisition and Involuntary Resettlement

Indigeous People

Biodiversity Conservation and Sustainable Management of Living Natural Resources

Stakeholder Engagement and Information Disclosure

Labor and Working Conditions

Resource Efficiency and Pollution Prevention

Cultural Heritage

Gender Equality

These Guidelines provide guidance to Borrowers on the requirements of Environmental and Social Performance Standard 3: Resource Efficiency and Pollution Prevention, with the overall purpose of improving project performance and environmental and social outcomes. The relevance of each ESPS and its Guideline depends on the nature, scale, and complexity of an operation and is proportionate to its level of environmental and social risks and impacts. It is important to note that ESPS 1 and 10 are likely to be relevant to all projects.

To facilitate reading:

1. All text belonging to the ESPF is formatted with a light blue background. The ESPF's text, including its footnotes, has kept its original paragraph and footnote numbering.
2. All Guideline paragraphs begin with the acronym "GL."
3. All footnotes are ESPF footnotes.

The Guidelines and other reference material will be publicly available on a dedicated website (https://www.iadb.org/en/mpas/guidelines). The IDB will periodically update the material on the website to reflect best practices and evolving needs.

DISCLAIMER

Guidelines are not policy, nor are they mandatory. The information presented in the Guidelines is for informational purposes only. Guidelines do not substitute the need to exercise sound judgment in making project decisions that are consistent with the ESPSs. In case of any inconsistency or conflict between the Guidelines and the ESPSs, the provisions of the ESPSs will prevail. In case of any inconsistency or conflict between the Guidelines and the Policy Statement in the ESPF, the provisions of the Policy Statement will prevail. Guidelines are approved by IDB Management and not by the IDB's Board.

INTRODUCTION

1. Environmental and Social Performance Standard (ESPS) 3 recognizes that increased economic activity and urbanization often generate increased levels of pollution to air, water, and land and consume finite resources in a manner that may threaten people and the environment at the local, regional, and global levels.[90] There is also a global consensus that the current and projected atmospheric concentration of greenhouse gases (GHG) threatens the public health and welfare of current and future generations. At the same time, more efficient and effective resource use, pollution prevention,[91] and GHG emission avoidance and mitigation technologies and practices have become more accessible and achievable in virtually all parts of the world. These are often implemented through continuous improvement methodologies similar to those used to enhance quality.

2. This ESPS outlines a project-level approach to resource management and pollution prevention and control, and avoidance and minimization of GHG emissions. It builds on the mitigation hierarchy, and the "polluter pays" principle. It recognizes the disproportionate impact of pollution on women, children, the elderly, and the poor and vulnerable. This ESPS also recognizes the emerging concept and practice of circular economy[92] and/or resource recovery, where usable and valuable products can be created or derived from what has been previously viewed as waste. The project-related risks and impacts associated with resource use and the generation of waste and emissions need to be assessed in the context of project location and local environmental conditions. Appropriate mitigation measures, technologies, and practices should be adopted for efficient and effective resource use, pollution prevention and control, and avoidance and minimization of GHG emissions, in line with internationally disseminated technologies and practices.

OBJECTIVES

- To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities.
- To promote more sustainable use of resources, including energy and water.

[90] For the purposes of this ESPS, the term "pollution" refers to both hazardous and non-hazardous chemical pollutants in the solid, liquid, or gaseous phases and includes other components such as pests, pathogens, thermal discharge to water, GHG emissions, nuisance odors, noise, vibration, radiation, electromagnetic energy, and the creation of potential visual impacts, including light.

[91] For the purpose of this ESPS, the term "pollution prevention" does not mean absolute elimination of emissions, but the avoidance at source whenever possible, and, if not possible, then subsequent minimization of pollution to the extent that the Performance Standard objectives are satisfied.

[92] A circular economy is based on the principles of designing out waste and pollution, keeping products and materials in use, and regenerating natural systems.

- To avoid or minimize project-related emissions of GHG.
- To avoid or minimize generation of waste.
- To minimize and manage the risks and impacts associated with pesticide use.

GL1. To achieve the objectives of Environmental and Social Performance Standard (ESPS) 3, Borrowers should take into account the risks and impacts of their activities on ambient conditions and public health (such as ambient air quality, noise level, soil, surface water and groundwater quality, condition of the biodiversity and living natural resources, impacts on community etc.) and seek to avoid or minimize these risks and impacts within the context of the project's natural and human ecosystems and the significance of pollutants emitted. For projects with limited potential pollution and impacts on resources that can be considered low/moderate risk, ESPS 3 objectives may be achieved through compliance with emissions and effluent standards (see paragraphs 4 and 5 of ESPS 3) and the application of cost-effective pollution prevention and control approaches consistent with good international industry practice (GIIP). Projects with a potential to generate significant impacts on existing ambient levels (i.e., airshed, watershed, soil, etc.), may require the implementation of project-specific control measures as well as monitoring of impacts on the surrounding environment (i.e., including beyond the project's area of influence as defined in Section 10 of ESPS 1 - *Assessment and Management of Environmental and Social Risks and Impacts* and relevant sections of Guideline 1). Further information on how to address ambient conditions is provided in paragraph 11 of ESPS 3 and this Guideline.

GL2. The potential environmental impacts associated with the direct and indirect emissions of greenhouse gases (GHGs) should be assessed in the context of the project's Area of Influence and within the project activities that falls under the borrower's responsibilities. Borrowers are encouraged to consider their potential contribution to climate change when developing and implementing their projects, to identify opportunities and methodologies for GHG reduction from the project design phase through to the implementation phase, and to minimize GHG emissions from core activities to the extent that this is cost-effective and technically feasible.

SCOPE OF APPLICATION

3. The applicability of this ESPS is established during the environmental and social risks and impacts identification process. The implementation of the actions necessary to meet the requirements of this ESPS is managed through the Borrower's Environmental and Social Management System, the elements of which are outlined in ESPS 1.

GL3. The identification and management of environmental and social risks and impacts is part of the Borrower's project development and management function and is a dynamic and continuous process in accordance with the requirements of ESPS 1. The Borrower must develop and implement a sound Environmental and Social Management System (ESMS)[1], for the effective management of the project's environmental and social performance throughout the project life cycle. The Borrower should include performance monitoring and revise their ESMS as necessary throughout the project life cycle.

REQUIREMENTS

4. During the project life cycle, the Borrower will consider ambient conditions and apply technically and financially feasible resource efficiency and pollution prevention principles and techniques that are best suited to avoid, or where avoidance is not possible, minimize adverse impacts on human health and the environment.[93] The principles and techniques applied during the project life cycle will be tailored to the hazards and risks associated with the nature of the project and consistent with GIIP,[94] as reflected in various internationally recognized sources, including the World Bank Group Environmental, Health and Safety Guidelines (EHSG).

5. The Borrower will refer to the EHSG or other internationally recognized sources, as appropriate, when evaluating and selecting resource efficiency and pollution prevention and control techniques for the project. The EHSG contains the performance levels and measures that are normally acceptable and applicable to projects. When applicable regulations differ from the levels and measures presented in the EHSG, Borrowers will be required to achieve whichever is more stringent. If less stringent levels or measures than those provided in the EHSG are appropriate in view of specific project circumstances, the Borrower will provide full and detailed justification for any proposed alternatives through the environmental and social risks and impacts identification and assessment process. This justification must demonstrate that the choice for any alternate performance levels is consistent with the objectives of this ESPS.

[93] Technical feasibility is based on whether the proposed measures and actions can be implemented with commercially available skills, equipment, and materials, taking into consideration prevailing local factors such as climate, geography, infrastructure, security, governance, capacity, and operational reliability. Financial feasibility is based on financial considerations, including relative magnitude of the incremental cost of adopting such measures and actions compared to the project's investment, operating, and maintenance costs.

[94] GIIP is defined as the exercise of professional skill, diligence, prudence, and foresight that would reasonably be expected from skilled and experienced professionals engaged in the same type of undertaking under the same or similar circumstances globally or regionally. The outcome of such an exercise should be that the project employs the most appropriate technologies in the project-specific circumstances.

GL4. When developing new projects or expanding existing facilities or operations, including any associated facilities, Borrowers should assess and incorporate environmental and social aspects of the project, including measures for the sustainable and responsible use of living and non-living resources and raw materials (e.g., any unprocessed material or primary commodity required to produce other products, such as crude oil, gas, mineral in its natural form, sand, gravel, raw biomass, water, product of agriculture, forestry, etc.), during the design, construction, operation, and/or decommissioning phases. For projects involving expansion of existing facilities, the Borrower should take into consider a gradual phase out of obsolete facilities in a safe manner, based on an assessment of potential environmental, health, safety and social impacts of any future decommissioning. Where warranted by the nature and scope of the project and its potential emissions to the environment, the assessment should include the identification and analysis of project design options and site selection alternatives. Considerations should include background ambient conditions that may occur due to natural and/or anthropogenic causes not related to the project but that might have a physical impact on the project, climate-related risks[2] (see also ESPS 4 – *Community Health, Safety, and Security*, and associated Guideline), both at project level and climate national policy, the presence of local communities and environmentally sensitive receptors, the expected project demand for water and other natural resources, and the availability of waste disposal facilities, among others.

GL5. Environmental and social impacts can occur at any phase of a project and depend on several factors including the nature and scope of the project and site location. Project design should consider the entire life cycle of a project, from site selection and construction, through commissioning, operation, decommissioning and environmental rehabilitation, as appropriate. Potential future expansions should also be accounted for in the initial design where these may reasonably be anticipated. The Borrower should, in accordance with the requirements of ESPS1, establish performance management and monitoring actions at the outset of the project and consider revisions throughout the project life cycle in response to unanticipated impacts or implementation challenges.

GL6. If a project involves or consists of existing facilities, the Borrower must assess how to meet the requirements of ESPS 3 and seek to improve existing performance through a program of time-bound actions included in the Environmental and Social Action Plan (ESAP).

GL7. If a project involves or consists of existing operations, the Borrower should identify actions to improve risks and environmental management practices to a level consistent with the objectives of ESPS 3. This may include relevant studies such as industrial risk assessment and/or hazard identification (HAZID) and hazard and operability (HAZOP) studies, considering facility operation scenarios at full load under routine circumstances, including possible intermittent exceedances during startups, shutdowns, and warm-up periods.

GL8. The Borrower should refer to the World Bank Group Environmental, Health and Safety Guidelines (EHSG or EHS Guidelines) together with other internationally recognized sources (e.g., other guidelines such as the European Union (EU) Industrial Emission Directive on Best Available Techniques Reference Documents" (BREFs) and other sector-specific guidance

documents on environmental protection and energy efficiency) when evaluating and selecting resource efficiency and pollution prevention and control techniques for the project. For new operations and facilities, the Borrower shall refer to the EHS Guidelines and other guidelines whose performance levels and measures are cost-effective and achievable by commercially available technology or consider the application of alternate performance levels and measures. Borrowers that propose application of performance levels or measures based on local laws and requirements that are less stringent than those in the EHS Guidelines must provide justification of the proposed technical alternatives, including results of specific studies demonstrating that environmental, social and public health risks associated with the project have been assessed and relevant mitigation measures identified.

GL9. When projects have significant environmental emissions or are located in already degraded environments, the Borrower must strive to improve the project's performance beyond the performance levels and measures articulated in applicable law and in the EHS Guidelines with due consideration of the existing assimilative capacity of the environment. The Borrower should outline target performance levels as early as possible in the project's life cycle, preferably at project design whenever feasible.

Resource Efficiency

6. The Borrower will implement technically and financially feasible and cost-effective[95] measures for improving efficiency in its consumption of energy, water, and other resources and material inputs, with a focus on core areas of project activities. Such measures will integrate the principles of cleaner production into project development with the objective of conserving raw materials, energy, and water. Where best practice benchmarking data are available, the Borrower will make a comparison to establish the relative level of efficiency.

GL10. The terms "Cleaner Production and "Resource Efficiency" refer to the concept of integrating pollution reduction into project/program design and to promote more sustainable and efficient use of resources, including adopting alternative technical solutions to avoid and minimize adverse impacts on human health and the environment. This involves the application of technically and financially feasible environmental strategies and circular approaches and practices to increase conservation of raw materials, water and energy, and living and non-living resources in line with GIIP.

[95] Cost-effectiveness is determined according to the capital and on operational cost, financial benefits, and environmental and social externalities of the measure, considered over the life of the operation.

GL11. The Borrower should identify cost-effective and technically feasible solutions consistent with GIIP to ensure the efficient use of resources, including energy, water, raw materials, and other finite resources, considering project features and the country-specific environmental and social context. In accordance with ESPS 1, resource efficiency measures shall be analyzed as part of the project's environmental and social risks and impacts identification process.

GL12. For existing facilities, it may be appropriate for Borrowers to commission experts to undertake Cleaner Production/Resource Efficiency studies such as screening, assessment, analysis, etc. and integrate the results into the project/program design.

GL13. If a project makes a significant use of raw materials such as sand, gravel, timber, and any other natural construction materials, the Borrower shall identify and implement measures to source such materials in a sustainable way and to minimize the quantity used in the project. Measures to eliminate, substitute, or reduce raw material use in various phases of project development may be found in the World Bank Group's General EHSGs.

GL14. In many industrial and commercial sectors, where the unit of output can be readily measured and defined, widely accepted benchmarks that describe performance in quantitative terms are available. For example, process energy use per ton of product is often an accepted benchmark. Similarly, building benchmarks could refer to energy or water use per unit of built area with adjustments for climatic variations. When these benchmarks are available and applied in accordance with or to supplement GIIP, they can be used to evaluate project performance of the resource efficiency or pollution intensity requirements of ESPS 3. If such benchmarks are not available, reference to GIIP may be appropriate to benchmark alternative approaches.

GL15. Projects using brand new machinery or equipment should reflect GIIP in resource efficiency. In energy intensive sectors and when new process machinery is sourced from international vendors, the expectation is that designs will meet best practice where this is established. When a Borrower invests in an existing manufacturing operation, or uses second-hand equipment, it may not always be possible to meet best practice standards due to physical or cost restraints. Consideration should be given to the technical and financial feasibility and effectiveness of proposed measures. Environmental and social implications of the selected alternative should be also investigated.

GL16. The Borrower should consider the different levels of resource efficiency of alternative capital equipment offers in the equipment selection process by taking into account resource efficiency, life cycle costing of the different options, and the cost-effectiveness of alternative offers. When comparison is made between a low capital cost offer for less efficient equipment and a higher cost offer for more efficient equipment, the Borrower should demonstrate the rationale used in the offer selection process (i.e., while retrofitting or upgrading an existing technology could be a cheaper option, it could be more expensive in the long run due to higher operating costs).

Greenhouse Gases

7. In addition to the resource efficiency measures described above, the Borrower will consider alternatives and implement technically and financially feasible and cost-effective options to avoid or minimize project-related GHG emissions during the design and operation of the project. These options may include, but are not limited to, alternative project locations, adoption of renewable or low carbon energy sources, sustainable agricultural, forestry, and livestock management practices, the reduction of fugitive emissions, and the reduction of gas flaring.

8. For projects that are expected to, or currently produce more than 25,000 tonnes of carbon dioxide (CO_{2e})-equivalent annually[96], the Borrower will quantify gross emissions from the project[97], including direct and indirect emissions associated with the project. Indirect emissions include those associated with the off-site production of energy[98] and GHG-intensive materials[99] used by the project, and emissions generated by project's direct users, when significant. The Borrower will quantify GHG emissions annually, in accordance with internationally recognized methodologies and good practice.[100]

GL17. Borrowers should seek to avoid and minimize emissions of GHG from early in the project life cycle, beginning at the project design phase through the consideration of technically and financially feasible and cost-effective options. There are many examples of cost-effective GHG-reducing measures. Options may include, but are not limited to, use of low-carbon fuels, sustainable agricultural practices (e.g., optimization of nitrogen fertilizer in agriculture), use of cement additives, GHG leakage avoidance or minimization measures, use of low global warming potential (GWP) chemicals, reduction of gas venting, sanitary landfill gas collection and combustion, and energy efficiency and renewable energy measures. Examples of energy efficiency measures include more energy efficient electricity generation, cogeneration of heat and power, tri-generation of heat, power and cooling, heat recovery, process changes, enhanced process control, leak elimination, insulation, and the use of more energy efficient demand-side equipment (e.g., electric motors, compressors, A/C units, fans, pumps, heaters, and lighting fixtures). Examples of renewable energy sources include solar power or heat generation, hydro[3], wind, certain types of geothermal, and sustainable biomass. Certain forms of agriculture

[96] The quantification of emissions should consider all significant sources of GHG emissions, including non-energy related sources such as methane and nitrous oxide, among others.
[97] Project-induced changes in soil carbon content or above ground biomass, and project-induced decay of organic matter may contribute to direct emissions sources and shall be included in this emissions quantification where such emissions are expected to be significant.
[98] Refers to the off-site generation by others of electricity, heat and steam used in the project.
[99] These include cement and steel.
[100] International Financial Institution Framework for a Harmonized Approach to Greenhouse Gas Accounting, the Intergovernmental Panel on Climate Change, various international organizations, and relevant host country agencies.

and forestry can sequester large quantities of carbon dioxide from the atmosphere. Carbon Capture and Storage (CCS) and Carbon Capture Utilization and Storage (CCUS) are examples of emissions reduction technologies with the potential to remove large quantities of carbon dioxide from large, concentrated point sources.

GL18. Most common greenhouse gases and their respective Global Warming Potential (GWP)[4] over a 100-year time frame based on the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) include:

i. Carbon dioxide (CO_2) (GWP = 1)
ii. Methane (CH_4) (GWP = 28)
iii. Nitrous oxide (N_2O) (GWP = 265)
iv. Hydrofluorocarbons (HFCs) (GWPs from 124 to 12,400)
v. Perfluorocarbons (PFCs) (GWPs from 6630 to 11,100)
vi. Sulphur hexafluoride (SF_6) (GWP = 23,500)

GL19. CO_2 is the most significant GHG, accounting for a large proportion of anthropogenic emissions. The next most significant GHG is CH_4, contributing 14 percent of anthropogenic emissions, followed by N_2O contributing 8 percent of anthropogenic emissions. CO_2 emissions are dominated by fossil fuel combustion, but CO_2 emissions also arise from deforestation and decay of biomass, soil conversion and from numerous industrial processes involving calcination of limestone (e.g., cement manufacturing) and oxidation of carbon (e.g., steelmaking). CH_4 is emitted during oil, gas, and coal extraction, refining and processing, from livestock, rice cultivation and some waste management practices. Most N_2O emissions result from soil cultivation, though the compound is also emitted during combustion and by certain industrial processes.

GL20. HFCs are commonly used as refrigerants and solvents and contribute to global warming when released from contained systems such as compressors. PFCs are used in electronics manufacturing and are formed as a byproduct in the production of primary aluminum. SF6 is used as a dielectric medium in the electrical industry as well as an inert gas in the magnesium industry and in other specialized industrial applications.

GL21. Examples of sectors that have potentially significant emissions of GHGs above the 25,000 tons CO_2-equivalent (CO_2e) per year threshold include energy, transport, heavy industry, building materials, agriculture, forest products and waste management. Reduction and control options that can be considered by Borrowers in these and other sectors include: (i) enhancement of energy efficiency, (ii) protection and enhancement of sinks and reservoirs of GHGs, (iii) promotion of sustainable forms of agriculture and forestry, (iv) promotion, development and increased use of renewable forms of energy, (v) CCS and CCUS technologies, (vi) limitation and/or reduction of methane emissions through recovery and use in waste management, as well as in the production, transport and distribution of energy (coal, oil, and gas), and (vii) the use of low carbon fuels.

GL22. Quantification of GHG emissions is an important step in managing and ultimately reducing GHG emissions in a cost-effective manner in accordance with the requirements of ESPS 3. The gathering of data needed to facilitate a Borrower's GHG emissions calculation is likely to provide greater transparency to the consumption and cost of utilities and allow for the comparison between different sites' performance. Quantification of GHG emissions will also facilitate a Borrower's participation in GHG reporting programs and other GHG-related initiatives and prepare them for transition to a lower carbon economy. Annual GHG emissions should be estimated over the life of the project, including the construction phase. For smaller projects with emissions of less than 25,000 tons CO_2e per year, GHG estimations are not required but are recommended.

GL23. When considering GHG emissions and their significance, Borrowers should use appropriate tools and methodologies for quantifying GHG emissions and comparing GHG quantities across alternative scenarios, for instance within an alternative analysis to be undertaken within the scope of ESPS1. Borrowers should quantify direct, indirect, and reasonably foreseeable GHG emissions related to the project's activities. Direct emissions of GHGs from the Borrower's operations and arising from within the physical boundary of the project (including Associated Facilities as defined under ESPS 1) are referred to as Scope 1 emissions, while those associated with off-site production of energy used by the project are referred to as Scope 2 emissions. There are occasions where emissions arise from within a Borrower's site, but not from the Borrower's operations: in principle such emissions should not be included in this GHG quantification[5]. Accounting for Scope 3 emissions should only be included when deemed relevant and treated in accordance with the IFI's harmonized GHG accounting methodology, IDB's Greenhouse Gas Assessment Emissions Methodology, and other sources. Examples include emissions from aircraft using the Borrower's airport, or emissions from vehicles using a toll road. Similarly, emissions arising from future combustion of fossil fuel by an end user would not be attributed to producers and handlers of the fuels (e.g., a hydrocarbons extraction, fuel transport or refining project). Calculation methodologies for a range of different projects are provided in the IDB Greenhouse Gas Assessment Emissions Methodology and other sources.

GL24. Indirect emissions associated with the production by others of electrical energy used by the project can be estimated by using a national average of GHG emissions performance for electricity generation (e.g., national average of CO_{2e} emissions per unit of electricity generated for the country). More project specific GHG emissions performance for electricity generation should be used if available (e.g., utility average of CO_{2e} emissions per unit of electricity generated for the utility from which the project purchases electricity). Similarly, project-specific data should be used to account for GHG emissions associated with purchases of heating or cooling energy produced by third parties. Calculation methodologies for a range of different projects are provided in the IDB Greenhouse Gas Assessment Emissions Methodology and other sources.

GL25. Borrowers are encouraged to disclose their GHG emissions annually through public reports, or through other voluntary disclosure mechanisms currently being used internationally such as the Task Force on Climate-Related Financial Disclosures (TCFD), Sustainability Accounting Standards Board and the Carbon Disclosure Project.

Water Consumption

9. When the project is a potentially significant consumer of water, in addition to applying the resource efficiency requirements of this ESPS, the Borrower shall adopt measures that avoid or reduce water usage so that the project's water consumption does not have significant adverse impacts on people and biodiversity. These measures include, but are not limited to, the use of additional technically feasible water conservation measures, the use of alternative water supplies, the reuse of water, water consumption offsets to reduce total demand for water resources to within the available supply, and evaluation of alternative project locations, as appropriate.

GL26. Borrowers' projects should not cause or contribute to unsustainable water stress of local resources and impact on third parties' water use (including local communities and biodiversity). Impact to available water resources and uses should be assessed as part of the E&S risks and impacts identification process in accordance with the requirements of ESPS 1.

GL27. The environmental and social assessment should consider the potential cumulative impacts of the project's water use on surface and groundwater, and impacts on water quality and quantity, including current and planned uses of water in the same hydrological watershed (including watersheds and groundwater). Appropriate mitigation measures should address short- and long-term cumulative impacts on communities, other users, ecosystem services, and the environment.

GL28. ESPS 3 requires the sustainable use of water resources. Cases of water abstraction at a rate exceeding natural recharge should be avoided. Borrowers that, in view of specific project circumstances propose to abstract water at a rate in excess of natural recharge should provide a full and detailed justification and demonstrate that such abstraction does not cause adverse effects to biodiversity, ecosystems, and/or other users of the water, that exist or can reasonably be expected to move into the area of influence of the project.

GL29. Depending on the significance of the projects' potential impacts on communities, other users, ecosystems, or the environment, the Borrower may include an assessment of the volume of water used per unit of production in the projects' environmental and social risks and impacts identification process. With respect to water productivity, approaches such as system-wide water balance may be useful to assess the extent to which water productivity increases affect other water users. For example, increasing water productivity, while maintaining existing water withdrawal, will increase the efficiency of water use, but, at the same time, may affect downstream water users who depend on return flow to rivers or groundwater aquifers.

GL30. Certain projects (e.g., projects with a large water footprint, with sensitive receptors or fragile ecosystems and projects where water is critical to ecosystem services) will require a detailed water balance (through desktop study and/or field surveys, monitoring and observation, etc.) that integrates climate-related variability and incorporates estimates relating to: (a) all inputs, such as precipitation, external inflow of rivers and groundwater, interbasin transfer, and returned water from users to a hydrological unit, such as a catchment/watershed or river basin; (b) all outputs from the hydrological unit, such as water abstraction from surface/groundwater resources, outflow of rivers and groundwater to the sea or neighboring territories, interbasin transfer or by evapotranspiration; and (c) changes in water storage in the hydrologic unit over a defined period of time, for example, during a month or a year. In preparing a detailed water balance, estimates of future water availability should be included, which can vary based on scenarios of anticipated changes in water demands or other factors, such as climate change. A good water balance supports management of water allocation among water users. It also supports river basin management planning as it provides information on water availability and demand and can indicate potential for water conservation. Methods to support the preparation of water balances include water accounting through remote sensing, in-situ sensors and flow meters with appropriate analysis to the extent technically and financially feasible, and in a manner proportionate to the project scope to estimate water flows, fluxes, stocks, consumption, and services, and to communicate water-resources-related information to communities, users, and decision makers in accordance with the requirements of ESPS 1 and ESPS 10 – *Stakeholder Engagement and Information Disclosure*.

GL31. Various options exist to improve water use efficiency to avoid or minimize adverse impacts of water consumption. Water use in agriculture, the largest consumer of water, can be made more efficient through irrigation-system improvements, irrigation scheduling, improving water-conveyance efficiency and leakage losses, managing soils to reduce runoff, and reusing water on-farm. Agricultural water consumption efficiency can be further improved through technologies and policies that incentivize maintaining net consumptive use (evapotranspiration) within specified limits, considering the implications for the overall watershed. Another example in urban areas, water use efficiency can be increased through building codes that encourage installation of low flow toilets and showers, consumer awareness campaigns to promote water efficient appliances, use of closed loop water systems, local wastewater treatment and reuse, and repair of water-distribution systems to reduce leakage.

GL32. In circumstances where a project is a significant net consumer of water or contributes to depletion of water resources to the extent that third parties' ability to access water is adversely affected, the Borrower shall use design and process technology solutions and measures to reduce the project's water consumption to a level at which these adverse impacts are adequately mitigated. Risks and iimpacts on the availability of water resources and uses should be assessed through the project risk and impact identification process, as defined in ESPS 1, and such assessment should be informed by a community engagement process consistent with the requirements of ESPS 10. Actions that the Borrower should consider meeting this objective include, but are not limited to, additional resource efficiency measures within the project site in addition to those necessary to satisfy paragraph 6 of ESPS 3, water sustainability and reuse options, alternative provision of water, and water consumption offsets outside the

project boundary. In this context, water consumption offsets are measures to reduce others' consumption of water from the same resource as that used by the project by an amount such that adverse project effects are mitigated. In circumstances where none of these measures are deemed to be sufficient to achieve sustainable use of water resources, re-siting of the project should be considered.

Pollution Prevention

10. The Borrower will avoid the release of pollutants or, when avoidance is not feasible, minimize and/or control the intensity and mass flow of their release. This applies to the release of pollutants to air, water, and land due to routine, non-routine, and accidental circumstances with the potential for local, regional, and transboundary impacts.[101] Where historical pollution such as land or ground water contamination exists, the Borrower will seek to determine whether it is responsible for mitigation measures. If it is determined that the Borrower is legally responsible, then these liabilities will be resolved in accordance with national law, or where this is silent, with GIIP.[102]

11. To address potential adverse project impacts on existing ambient conditions[103], the Borrower will consider relevant factors, including, for example, (i) existing ambient conditions, (ii) the finite assimilative capacity[104] of the environment, (iii) existing and future land use, (iv) the project's proximity to areas of importance to biodiversity, and (v) the potential for cumulative impacts with uncertain and/or irreversible consequences. In addition to applying resource efficiency and pollution control measures as required in this performance standard, when the project has the potential to constitute a significant source of emissions in an already degraded area, the Borrower will consider additional strategies and adopt measures that avoid or reduce negative effects. These strategies include, but are not limited to, evaluation of project location alternatives and emissions offsets.

[101] Transboundary pollutants include those covered under the Convention on Long-Range Transboundary Air Pollution.
[102] This may require coordination with national and local government agencies, communities, and the contributors to the contamination, and that any assessment follow a risk-based approach consistent with GIIP, as reflected in the EHSG.
[103] Such as air, surface and groundwater, and soils.
[104] The capacity of the environment for absorbing an incremental load of pollutants while remaining below a threshold of unacceptable risk to human health and the environment.

GL33. Borrowers should seek to avoid and minimize pollution from early in the project life cycle, beginning at the project design phase, through technically and financially feasible and cost-effective options. When the release of pollutants is unavoidable, the Borrower should identify technically and financially feasible technologies and processes to reduce and mitigate their release into the environment. When details on the level of the resulting contamination are not available, or for projects whose release of pollutants and impacts are uncertain and/or potentially irreversible, the environmental and social assessment should include an analysis of the source, nature, and magnitude of the emission or discharge and its pathway and interaction with the ecosystem, including the sensitivity of receptors. Based on this analysis, appropriate technologies and processes must be selected.

GL34. The monitoring frequency should be commensurate to the nature, scale and variability of potential impacts and may range from continuous monitoring to daily, monthly, annual, or other frequency in accordance with the nature of project emissions, their potential for accumulation in the environment and impacts. An assessment of risks and impacts may be necessary when changes to the project are under consideration that might involve changes to the nature or scale of emissions. Such changes are often considered through a Management of Change Procedure, which may also result in adjustments to monitoring frequency. Guidance on recommended monitoring approaches and frequencies appropriate to the nature of specific operations is available from various internationally recognized sources including the EHS Guidelines. Monitoring emissions can benefit Borrowers by: (i) demonstrating compliance with environmental permits or other legal obligations, (ii) promptly identifying any process or equipment upsets, (iii) providing information to evaluate project performance and determine if corrective actions are necessary, (iv) helping to identify opportunities for further improvement, and (v) providing data to evaluate the impact on the ambient levels.

GL35. Monitoring is particularly important for large projects with emissions that might lead to potentially irreversible impacts and therefore require more frequent evaluation of emission levels and their effect on the ambient environment. Monitoring processes, necessary equipment and facilities and indicators, should form part of the project's ESMS. The ESMS may also include elements of continuous improvement, through regular optimization of operational processes, maintenance, and upgrades, to encourage performance levels that go beyond compliance with emissions and effluent standards or guidelines. Improvements may include efficiency gains in production, manufacturing and construction processes that result in better operational, environmental, or financial performance through, for example, reductions in energy and/or water consumption or lower solid/liquid waste production per unit of output.

GL36. Project-related emissions will be monitored, tabulated, and reported in accordance with requirements of national law, conditions in project permits, and requirements associated with the ESPSs and the Environmental and Social Action Plan (ESAP) and all management plans developed by the Borrower for the project. Pollutant release and transfer registers that collect and disseminate data on environmental releases and transfers of pollutants from industrial facilities have been found effective in promoting pollution reduction in some sectors, particularly where all or most facilities operating within a geographic region participate and where the

information is public and made accessible to local communities. Where such registries are not required by law, and in addition to meeting the requirements of ESPS 1 related to disclosure of significant potential environmental impacts, Borrowers are encouraged to participate in voluntary initiatives to establish formal pollutant release and transfer registers at the national or regional levels.

GL37. Where the project involves historical pollution (e.g., defined as pollution from past activities affecting land and water resources for which no party has assumed or been assigned responsibility to address and carry out the required remediation), the Borrower will establish a process to identify the responsible party. If one or more third parties are responsible for the historical pollution, the Borrower will consider seeking resources from such parties so that the pollution is appropriately remediated and does not pose a significant risk to the health and safety of workers and communities. Where a contamination is identified, the Borrower should seek to determine who has the legal liability to manage this contamination. If no responsible party can be identified due to historic legacy and/or multiple sources of pollution and inability to make an attribution, the Borrower will need to identify if they can be indemnified against any future clean up claims, or otherwise assess the risk and financial implications of future liabilities and budget accordingly. The Borrower may bear this responsibility due to its own past actions or inactions or may have taken on this liability when acquiring the site. In other cases, contamination may have been identified and legal provisions made to isolate the Borrower from such liability when acquiring the site. If the historical pollution poses a significant risk to human health or the environment, a health and safety risk assessment consistent with GIIP shall be undertaken. The health and safety risk assessment should be proportionate to the potential risks and impacts of the historical pollution and may be conducted as part of the environmental and social impact assessment (ESIA). Appropriate mitigation measures to address health and safety risks to project workers and residential areas/communities should be identified and implemented in accordance with national laws and GIIP (see also ESPS 4 and its accompanying Guideline for additional information on community health, safety and security aspects). Contamination management options will be site-specific, should be developed in consultation with other stakeholders (as specified in ESPS 10 and its accompanying Guideline), and may include contamination containment, isolation/buffer zones as well as mitigation.

Assimilative Capacity of the Environment

GL38. The Borrower should assess the assimilative current and future capacity of the environment that includes the nature of the receiving environment, such as the existence of water bodies, soils, airsheds, and forests, as well as temporal and seasonal factors. In addition, climate change adaptation and resilience actions should be considered, including through the provisions and requirements of ESPS 4 and its Guideline.

GL39. The assimilative capacity of receiving water bodies may depend on numerous factors such as the total volume of water, flow and flushing rates, temperature of received discharge, and the loading of pollutants from other effluent sources in the area or region. The assimilative capacity of soil may depend on the characteristics of both the received discharge and the soil, as well as the type of microbial, chemical, and physical reactions that take place in the soil layer, and climatic conditions. The assimilative capacity of an airshed is affected by emission levels, ambient air quality characteristics, and prevailing meteorological conditions. Appropriate modeling or similar tools should be used to determine critical emission loads on the different environmental receptors. Information on the assimilative capacity of the environment, including benchmarks and thresholds for various pollutants and substances may be found in the Annotated Bibliography, here: https://www.iadb.org/en/mpas/guidelines.

GL40. When developing a new project (including major expansion of an existing operation) that is expected to produce potentially significant emissions of pollutants (see the WB General and Industry Sector EHS Guidelines for relevant thresholds), the environmental and social assessment should evaluate whether the existing background ambient levels comply with the relevant ambient quality guidelines and/or standards. Ambient quality standards are ambient quality levels established and published through national or local legislative and regulatory processes. Ambient quality guidelines refer to ambient quality levels primarily developed through clinical, toxicological, and epidemiological evidence (such as those published by the World Health Organization). Receiving water, air, and soil quality standards may also be established on a site-by-site basis and will depend on receiving water, air, and soil quality objectives.

GL41. If the results of the assessment confirm that ambient levels exceed the relevant ambient quality guidelines or standards (i.e., ambient conditions are already deteriorated), Borrowers are expected to demonstrate that they have explored and, if necessary, adopted a higher level of performance than would otherwise be required under less deteriorated ambient conditions as well as further mitigation measures (e.g., offsetting emissions, modifying site selection) in order to minimize further deterioration of the environment or preferably to achieve improvement. If ambient levels comply with relevant ambient quality guidelines and/or standards, projects with potentially significant emissions of pollutants should be designed to reduce the potential for significant deterioration and to allow for continued compliance with guidelines or standards. The General EHS Guidelines gives further guidance on this matter, including cases where ambient quality guidelines are exceeded in the pre-project case.

GL42. For projects that may discharge effluents into receiving water bodies lacking assimilative capacity, water sustainability and reuse options, zero discharge systems and offsets outside the project boundary shall be considered where technically and financially feasible.

GL43. Where a project is expected to potentially generate significant emissions of pollutants involves the modernization or retrofit of an existing facility, the current ambient conditions should be evaluated to determine if they comply with the country's ambient quality guidelines or standards. If the levels exceed ambient quality guidelines and/or standards, and if the existing facility is a major source of emissions affecting such exceedances, the feasibility of options to reduce emissions and of measures that improve current ambient conditions should be considered in the project's environmental and social assessment.

GL44. Borrowers with projects located in or near vulnerable communities or ecologically sensitive areas or whose area of influence includes ecologically sensitive areas such as national parks or providers of ecosystem services (see ESPS 6 - Biodiversity Conservation and Sustainable Management of Living Natural Resources and ESPS 4 - Community Health, Safety, and Security and their associated Guidelines) should implement measures to avoid or minimize incremental impacts of the projects.

Wastes

12. The Borrower will avoid the generation of hazardous and non-hazardous waste materials. Where waste generation cannot be avoided, the Borrower will reduce the generation of waste and recover and reuse waste in a manner that is safe for human health and the environment. Where waste cannot be recovered or reused, the Borrower will treat, destroy, or dispose of it in an environmentally sound manner that includes the appropriate control of emissions and residues resulting from the handling and processing of the waste material. If the generated waste is considered hazardous[105], the Borrower will adopt GIIP alternatives for its environmentally sound disposal while adhering to the limitations applicable to its transboundary movement[106]. When hazardous waste disposal is conducted by third parties, the Borrower will use contractors that are reputable and legitimate enterprises licensed by relevant government regulatory agencies and obtain chain of custody documentation to the final destination. The Borrower should ascertain whether licensed disposal sites are being operated to acceptable standards and where they are, the Borrower will use these sites. Where this is not the case, the Borrower should reduce waste sent to such sites and consider alternative disposal options, including the possibility of developing their own recovery or disposal facilities at the project site.

[105] As defined by international conventions or national legislation.

[106] Transboundary movement of hazardous materials should be consistent with national, regional, and international law, including the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal and the London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter.

GL45. Because of the risks to human health and the environment and the ever-increasing costs and liabilities associated with the management and/or disposal of waste material, ESPS 3 requires Borrowers to investigate options for waste avoidance, waste reduction, waste recovery and/or waste disposal during the design, construction, operational, closure and decommissioning stages of the project so that waste is managed responsibly. The level of effort to address this requirement depends on the risks associated with the waste materials generated by the project. Borrowers will have to assess the location of the final disposal of their waste and whether such locations are being operated to acceptable standards even if the disposal is conducted by a third party, and especially if the waste is considered hazardous to human health and the environment. If no suitable disposal method is available through commercial or other means, Borrowers shall discontinue, or if not possible, minimize waste sent off-site and consider developing their own recovery or disposal facilities or work with local municipalities or through licensed local private sector waste management operators to identify viable alternatives or approaches. Additional guidance is provided in the World Bank Group General and Industry Sector EHS Guidelines together with other internationally recognized sources.

GL46. In cases where the waste treatment, storage, or disposal alternative selected has the potential to generate polluting emissions or residues, the Borrower should apply adequate control techniques to avoid, minimize or reduce them according to the requirements of paragraphs 12 and 13 of ESPS 3. Environmentally sound and safe management of wastes and the obligations to manage such wastes shall be included in relevant contractual arrangements of the project, particularly the technical design and construction contracts. Waste containers designated for off-site shipment of hazardous wastes shall be secured and labeled, properly loaded on approved transport vehicles, and accompanied by chain of custody documentation. Further information on the environmentally sound handling and disposal of wastes can be found in numerous publications addressing the implementation of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and the Stockholm Convention on Persistent Organic Pollutants.

GL47. The requirement to obtain and maintain on file chain-of-custody documentation will allow the Borrower to demonstrate that all wastes sent from the project site were transported by a licensed carrier to a licensed final disposal facility in a manner meeting the objectives of ESPS 3.

Hazardous Materials Management

13. Hazardous materials are sometimes used as raw material or produced as product by the project. The Borrower will avoid or, when avoidance is not possible, minimize and control the release of hazardous materials.[107] In this context, the production, transportation, handling, storage, and use of hazardous materials for project

[107] These materials may include chemical fertilizer, soil amendments, and chemicals other than pesticides.

activities must be assessed. The Borrower will consider less hazardous substitutes where hazardous materials are intended to be used in manufacturing processes, construction activities, or other project-related activities or operations. The Borrower will avoid the manufacture, trade, and use of chemicals and hazardous materials subject to international bans or phase-outs due to their high toxicity to living organisms, environmental persistence, potential for bioaccumulation, or potential for depletion of the ozone layer.[108]

GL48. Hazardous materials present a risk to human health, community, and the environment due to their physical, chemical, or biological characteristics (see also ESPS 4 and its accompanying Guideline). The best way to prevent the release of hazardous materials is to avoid using them in the first place. Therefore, Borrowers should explore opportunities throughout the project life cycle to substitute hazardous materials with non-hazardous materials. This is especially relevant where the risks arising from the materials cannot easily be prevented or mitigated under normal use and/or disposal at the end of the life cycle of the hazardous materials. The effectiveness, compatibility, and cost of the substitute, and existing measures to adequately control its use and disposal will be considered when determining its suitability for use. Substitutions have been found and implemented in many cases, for example, in the use of asbestos in building materials, polychlorinated biphenyls (PCBs) in electrical equipment, persistent organic pollutants in pesticide formulations, and ozone-depleting substances in refrigeration and cooling systems. See the Annotated Bibliography (https://www.iadb.org/en/mpas/guidelines) for links to additional guidance materials. Hazards presented by a chemical are summarized in a Safety Data Sheet (SDS), which should be readily available from the supplier or other public sources and accessible in a local language or the language used by workers. The Borrower will provide training to project personnel and workers handling hazardous materials and ensure suitable hazardous waste storage facilities are available, along with relevant control measures, including secondary containment, temperature, humidity, and ventilation controls. A registry of hazardous materials used by the project should be maintained and regularly verified against potential and actual legislative changes on the phase-out or prohibition of use of certain chemicals and hazardous substances and materials, as well as requirements for the safe decommissioning of project facilities.

GL49. The Borrower should conduct a hazard analysis of its operations and disclose information related to hazardous materials management to stakeholders (including project workers and affected communities, in accordance with ESPSs 1, 2, and 4 and their respective Guidelines) when a project has the potential to release toxic, hazardous, medical and radiological[6] waste, modified living organisms, flammable or explosive material, or where project operations could

[108] Consistent with the objectives of the Stockholm Convention on Persistent Organic Pollutants and the Montreal Protocol on Substances that Deplete the Ozone Layer. Similar considerations will apply to certain WHO classes of pesticides.

result in injury to plant personnel or the public as identified in the environmental and social risks and impacts identification process. Hazard analysis is often conducted in conjunction with Hazard Identification (HAZID), Hazard and Operability studies (HAZOP), Process Safety Management (PSM), and Quantitative Risk Analysis (QRA). Hazard analysis allows Borrowers to systematically identify systems and procedures that could result in accidental pollutant release and quantify these risks to the extent possible, and also helps to prioritize the allocation of resources for emergency response equipment and training programs. The Borrower will segregate hazardous materials for storage, transportation and disposal or treatment. For projects that foresee the use of significant amounts of hazardous materials and / or where there is a risk of an uncontrolled spill of hazardous materials, a spill control, prevention, and countermeasure response plan will be prepared as part of the environmental and social assessment and implemented by the Borrower.

GL50. Borrowers should review the list of chemicals included in Annexes A and B of the Stockholm Convention to ensure that no chemical formulations manufactured, sold, or used in the Project include these chemicals unless it meets the highly exceptional circumstances noted in those same annexes (for example, the use of DDT for malaria control). Persistent Organic Pollutants are chemicals that have five characteristics of environmental and public health concern: they are toxic, long-lived, and mobile, and they accumulate in fatty tissue and magnify in the food chain. Their high mobility makes them a global issue, while their other properties mean that they are hazardous to animal and human health even at low levels of exposure. Where projects have pre-existing involvement with such chemicals, including the presence of existing stockpiles of obsolete chemicals, the Borrower's ESAP should include a phase-out plan in accordance with the requirements of ESPS 3.

GL51. The Borrower should also minimize the unintentional generation and release of chemicals listed in Annex C of the Stockholm Convention. Guidance on how to identify, quantify and reduce emissions of Annex C chemicals from potentially significant sources is included in publications supporting the implementation of the Stockholm Convention.

GL52. The Borrower should also review the list of chemicals included in Annex III of the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade and seek to avoid their manufacture, trade, and use. The use of chemicals in this list has been banned or severely restricted in several national jurisdictions in order to protect human health and the environment. The list includes some pesticide formulations considered severely hazardous due to their serious health or environmental effects.

GL53. The Borrower should also review the Montreal Protocol on Substances that Deplete the Ozone Layer. Borrowers should avoid manufacture and consumption of Annex A and Annex B compounds—namely, chlorofluorocarbons (CFCs), halogens, carbon tetrachloride and 1,1,1-trichloroethane. Continued use of CFC refrigerant already present within refrigeration and cooling equipment and systems is permitted, although in these circumstances it is good

practice to minimize refrigerant leakage. While the Montreal Protocol does not require complete phase out of hydrochlorofluorocarbon (HCFC) refrigerants until January 1, 2040, in Article 5 countries, in many countries zero ozone-depletion-potential alternatives are already in use and are preferred to HCFCs.

GL54. The Borrower should adopt measures for the sound and safe management of mercury. The Minamata Convention on Mercury addresses the avoidance of primary mercury production and measures regarding its intentional use in products and processes, unintentional release from industrial activity and trade. The Borrower will implement environmentally sound management of mercury, including proper handling, storage, and final disposal throughout the life of the project, including the clean-up of mercury-contaminated sites.

GL55. The Borrower should also review requirements for the appropriate management of living modified organisms and genetically modified organisms. The Cartagena Protocol on Biosafety to the Convention on Biological Diversity promotes biosafety by establishing rules and procedures for the safe handling, transport, packaging, identification and use of living modified organisms, also referred to as genetically modified organisms. There is a specific focus on transboundary movements of living modified organisms from one country to another. These rules are designed to protect ecosystems from the release of living modified organisms that may have adverse effects on biological diversity, taking also into account risks to human health.

GL56. The Borrower will adopt plans and measures that are in line with recognized international standards and guidelines, ESPS 3 and GIIP. If this is not possible the Borrower will determine if the proposed practices are appropriate in view of specific project circumstances. In this case, the Borrower will provide full and detailed justification for any proposed alternatives through the environmental and social risks and impacts identification process. This justification must demonstrate that the choice for any alternative option is consistent with the objectives of ESPS 3 and complies with national legislation and applicable international conventions requirements.[7,8]

Pesticide Use and Management

14. The Borrower will, where appropriate, formulate and implement an integrated pest management (IPM) and/or integrated vector management (IVM) approach in targeting economically significant pest infestations and disease vectors of public health significance. The Borrower's IPM and IVM program will integrate coordinated use of pest and environmental information along with available pest control methods, including cultural practices, biological, genetic, and, as a last resort, chemical means to prevent economically significant pest damage and/or disease transmission to humans and animals.

GL57. Pesticides are intended to kill or inhibit organisms that cause disease and threaten public health, as well as control insects, fungus, weeds, and pests that damage crops. While pesticides provide important benefits when used properly, they are also chemical substances that can be dangerous to produce, transport, use and dispose and should therefore be managed carefully whenever their use proves to be necessary. In accordance with the mitigation hierarchy set out in ESPS 1, the Borrower should avoid the use of pesticides to the extent possible and, where avoidance is not viable, minimize and further reduce their use over time. Minimization means pesticides are used only to the extent necessary to achieve the project objectives under an integrated pest management (IPM)[9] and/or integrated vector management (IVM)[10] approach. Reduction over time means the Borrower seeks to make pest management more sustainable over the life of the project by reducing the use of chemical pesticides. The need for chemical pesticide use will be assessed through the environmental and social risks and impacts identification process. The process will describe the proposed use and intended users, as well as the nature and degree of associated risks. Pesticide users of should always read, understand and adhere to the manuals and instruction of an approved pesticide before use, to ensure appropriate handling and application to minimize risk to human health. As part of the process, the Borrower should also take into consideration the risks and impacts the health and resources of nearby communities as described in ESPS 4.

GL58. Borrowers involved in agricultural activities that require the use of chemical pesticides by third parties, including in the supply chain, should promote the use of IPM approaches through all feasible means and should monitor their implementation against desired outcomes, targets and performance indicators to be set within the framework of the management programs and the action plans (or management plans) therein.

GL59. For any project involving significant pest management (e.g., locust control, mosquito or other disease vector control, rodent control, and the like) or activities that may lead to significant pest and pesticide management issues[11], the Borrower should prepare a Pest and Pesticides Management Plan (PPMP). The PPMP should be integrated into the broader framework of the management plans prepared in accordance with ESPS 1 requirements and, as such, should include performance targets for its implementation monitoring and follow up throughout the life of the project.

15. When pest management activities include the use of chemical pesticides, the Borrower will select chemical pesticides that are low in human toxicity, that are known to be effective against the target species, and that have minimal effects on non-target species and the environment. When the Borrower selects chemical pesticides, the selection will be based upon requirements that the pesticides be packaged in safe containers, be clearly labeled for safe and proper use, and that the pesticides have been manufactured by an entity currently licensed by relevant regulatory agencies.

16. The Borrower will design its pesticide application regime to (i) avoid damage to natural enemies of the target pest, and where avoidance is not possible, minimize, and (ii) avoid the risks associated with the development of resistance in pests and vectors, and where avoidance is not possible, minimize. In addition, pesticides will be handled, stored, applied, and disposed of in accordance with the Food and Agriculture Organization's International Code of Conduct on Pesticide Management or other GIIP.

17. The Borrower will not purchase, store, use, manufacture, or trade in products that fall in WHO Recommended Classification of Pesticides by Hazard Class Ia (extremely hazardous); or Ib (highly hazardous). The Borrower will not purchase, store, use, manufacture, or trade in Class II (moderately hazardous) pesticides, unless the project has appropriate controls on manufacture, procurement, or distribution and/or use of these chemicals. These chemicals should not be accessible to personnel without proper training, equipment, and facilities to handle, store, apply, and dispose of these products properly. The Borrower will also ensure the safe use of pesticides taking into consideration their classification under the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

GL60. The Borrower is expected to exercise a high degree of diligence in the selection of pesticides so that the selected pesticides meet the project's technical specifications. Under certain circumstances the use of pesticides may be needed, for example in managing a vector that is responsible for a disease outbreak. In these instances, careful selection and application of pesticides is warranted to limit impacts on nontarget species, the environment, and human health.

GL61. When selecting pesticides, the Borrower should consider the proposed use and intended users. When using pesticides, the Borrower should take the necessary precautions to protect human health and the environment in accordance with the principles and requirements of ESPS 2 – *Labor and Working Conditions*, ESPS 4, ESPS 6, and ESPS 9 – Gender Equality. Training and awareness raising should be considered for all personnel involved in pesticide management (handling, applying, packing, transporting, storing and disposal) to prevent harm to human health and the environment (e.g., surface and groundwater pollution, air pollution by wind drift beyond the targeted application area, and other adverse effects). Similarly, when the use of pesticides poses a risk to other personnel and to local communities, advance communication, training and awareness raising should be considered as part of the broader stakeholder engagement and information disclosure process required under ESPS 10.

GL62. The list of pesticides proposed for purchase under the project must be checked against the criteria of toxicity, carcinogenicity, mutagenicity, and reproductive toxicity outlined in the Globally Harmonized System of Classification and Labelling of Chemicals and as set forth by relevant international agencies. The relevant international conventions must be considered in the environmental and social risks and impact assessment process as they relate to the project. The requirements of the conventions, protocols, and agreements are addressed, as relevant, in any proposed mitigation measures.

GL63. The packaging requirements for pesticides under ESPS 3 are intended to protect the health and safety of persons involved in the transportation, storage, and handling of the pesticides and of communities in the vicinity of projects involving these activities, and to reduce the need for transfer between containers or repackaging into improvised containers. The labeling requirements should clearly identify the contents of the package and include instructions for intended use as well as safety information. Packaging and labeling of pesticides should be done in a form and language that is appropriate for each specific market and should follow the guidelines for the proper packaging and labeling of pesticides that have been developed by the Food and Agriculture Organization. Labelling and packaging requirements should be part of the training and awareness raising to be considered for personnel handling and applying pesticides, as described under GL52.

GL64. Purchasing pesticides manufactured under license will increase the likelihood that the pesticides meet minimum quality and purity conditions consistent with the use and safety documentation provided. The Borrower should refer to and follow the recommendations and minimum standards described in the guidelines published by the Food and Agriculture Organization and national regulations, if any applicable.

GL65. The storage, handling, application, and disposal of pesticides according to good international industry practice should include a program to discontinue the use of pesticides listed in Annex A of the Stockholm Convention, and to temporarily store and final dispose them in an environmentally sound manner, especially when these pesticides are considered obsolete. If a PPMP is prepared, the program should be described therein and agreed with the bank.

GL66. The Borrower should seek to promote the responsible management and use of pesticides within the context of IPM by interacting with the agricultural extension services or similar organizations that may be available locally.

ENDNOTES

[1] The minimum requirements for a sound Environmental and Social Assessment and Management System are provided in Section 5 of ESPS 1 Assessment and Management of Environmental and Social Risks and Impacts and associated sections of Guideline 1.

[2] For the purposes of this ESPS, "climate-related risks" are those risks related to the transition to a lower-carbon economy (such as extensive policy, legal, technology, and market changes to address mitigation and adaptation requirements related to climate change) and risks related to the physical impacts of climate change on the project (such as such direct damage to assets due to changes in water availability, sourcing, and quality, significant temperature changes affecting organizations' assets, infrastructures, operations, supply chain, transport needs, and employee safety).

[3] Hydropower reservoirs can emit Greenhouse gases (GHG) such as carbon and methane as a result of aerobic and anaerobic decomposition of biomass in the water. The exact amounts of GHG that form in and are emitted from hydropower reservoirs depend on site-specific and regional factors.

[4] Global Warming Potential (GWP) is used to adjust for the energy the emissions will absorb. Specifically, the GWP is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given time-period, relative to the emissions of 1 ton of carbon dioxide (CO2). Typically, the time-period used for the reporting of GHG emissions, and for the selection of the appropriate GWP, is 100 years (GWP100). By and large GHG accounting practitioners use GWP tables compiled by the Intergovernmental Panel on Climate Change (IPCC) and published in IPCC's assessment reports. GWP values have changed over time, to reflect the increasing scientific understanding of the different greenhouse gases and of their effect on the climate system.

[5] These are defined as Scope 3 emissions and refer to activities from assets not owned or controlled by the Borrower, but that indirectly impacts in its value chain and are also referred to as value chain emissions.

[6] This does not apply to the purchase of medical equipment, quality control (measurement) equipment, or any equipment where it can be demonstrated that the radioactive source is trivial and/or adequately shielded.

[7] The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.

[8] MARPOL 73/78 (The International Convention for Prevention of Marine Pollution for Ships).

[9] IPM can be defined as a mix of farmer-driven, ecologically based pest control practices that seeks to reduce reliance on synthetic chemical pesticides. It may involve a range of measures, means, and tools such as: (a) managing pests (keeping them below economically damaging levels) rather than seeking to eradicate them; (b) integrating multiple methods (relying, to the extent possible, on nonchemical measures) to keep pest populations low; and (c) selecting and applying pesticides, when they have to be used in a way that minimizes adverse effects on beneficial organisms, humans, and the environment.

[10] IVM is a rational decision-making process for the optimal use of resources for vector control. The approach seeks to improve the efficacy, cost-effectiveness, ecological soundness, and sustainability of disease-vector control. Vector control is a key component of vector-borne disease management. IVM approaches integrate both chemical and nonchemical interventions to manage disease vectors in a cost-effective and environmentally sound manner. IVM approaches limit reliance on chemical pesticides and reduce the selection pressure for insecticide resistance.

[11] Such as: (a) new land-use development or changed cultivation practices in an area; (b) significant expansion into new areas; (c) diversification into new crops in agriculture; (d) intensification of existing low-technology systems; (e) proposed procurement of relatively hazardous pest control products or methods; or (f) specific environmental or health concerns (e.g., proximity of protected areas or important aquatic resources; worker safety).