

Environmental Checklist: 9. Chemical Manufacturing (1)

Category	Environmental Item	Main Check Items	Confirmation of Environmental and Social Considerations
1. Permits and Approvals, Explanations	(1) ESIA and Environmental Permits	① Have ESIA reports been officially completed? Have ESIA reports been written in the official language or a language widely used in the host country? ② Have ESIA reports been approved by the government of the host country? ③ Have ESIA reports been unconditionally approved? If conditions are imposed on the approval of ESIA reports, are the conditions satisfied? ④ In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	
	(2) Explanations to the Public	① Is the project accepted in a manner that is socially appropriate to the country and locality throughout the preparation and implementation stages of the project based on sufficient consultations with stakeholders, such as local residents, conducted via disclosure of project information and potential impacts? ② Are the records of such consultations with the stakeholders, such as local residents, prepared? ③ Are the written materials for the disclosure prepared in a language and form understandable to the local residents? ④ Are ESIA reports available at all times for perusal by stakeholder such as local residents, and copying of the reports permitted? ⑤ Are proper responses made to comments from the public and regulatory authorities?	
2. Anti-pollution Measures	(1) Air Quality	① Do air pollutants, such as sulfur oxides (SO _x), nitrogen oxides (NO _x), and soot and dust emitted from the project comply with the host country's emission standards? ② Are adequate measures taken to prevent air pollution by the leakage of hazardous chemical substances? ③ Is there a possibility that air pollutants emitted from the project will cause areas that do not comply with the host country's ambient air quality standards? ④ Are adequate measures taken to reduce GHG emissions from the project?	
	(2) Water Quality	① Do effluents (containing BOD, COD, SS, oil and grease, pH, and other chemicals that depend on the specific process configuration) from various processes comply with the host country's effluent standards? ② Are adequate measures taken to prevent contamination of surface water, groundwater and soil by the effluents from storage areas, including raw materials, chemicals, intermediate products, final products, and wastes? ③ Does the quality of sanitary wastewater and stormwater comply with the host country's effluent standards? ④ Are adequate measures taken to prevent contamination of surface water and groundwater by these effluents? Is there a possibility that the effluents from the project will cause areas that do not comply with the host country's ambient water quality standards?	
	(3) Waste	① Are hazardous wastes generated from various facilities properly stabilized, treated, and disposed of in accordance with the laws and regulations of the host country? Are non-hazardous wastes also properly treated and disposed of in accordance with the laws and regulations of the host country?	

Environmental Checklist: 9. Chemical Manufacturing (2)

Category	Environmental Item	Main Check Items	Confirmation of Environmental and Social Considerations
2. Anti-pollution Measures	(3) Waste	② Are adequate measures taken to prevent contamination of soil and groundwater by leachates from the waste storage/disposal sites?	
	(4) Soil Contamination	① Has the soil at the project site been contaminated in the past, and are adequate measures taken to prevent soil contamination by leaked materials, such as raw materials and chemicals used?	
	(5) Noise and Vibration	① Do noise and vibrations from the operation comply with the host country's standards? ② Is there a possibility that noise generated by large vehicle traffic for transportation of materials, such as raw materials and products will cause impacts?	
	(6) Subsidence	① In the case of withdrawal of a large volume of groundwater, is there a possibility that it will cause subsidence?	
	(7) Odor	① Are there any odor sources? Are adequate odor control measures taken?	
3. Natural Environment	(1) Protected Areas	① Is the project site located in protected areas designated by the host country's laws or international treaties etc.? Is there a possibility that the project will significantly affect the protected areas?	
	(2) Ecosystem and Biota	① Does the project cause significant conversion or significant degradation of forests with important ecological value (including primary forests and natural forests in tropical areas) and habitats with important ecological value (including coral reefs, mangrove wetlands and tidal flats)? ② In case the projects involve the significant conversion or degradation of natural habitats including natural forests, is the avoidance of impacted considered preferentially? If the impacts are unavoidable, will the appropriate mitigation measures be taken? ③ Will the evaluation of the impacts on natural habitats by the project and consideration for the offset measures be carried out based on expert opinion? ④ Is the illegal logging of the forest avoided? ⑤ Does the project site encompass the protected habitats of endangered species designated by the host country's laws or international treaties etc.? ⑥ Is there a possibility that the amount of water (e.g. surface water, groundwater) used by the project will adversely affect aquatic environments such as rivers, in the case of development in the land area? Are adequate measures taken to reduce the impacts on aquatic environments, such as aquatic organisms? ⑦ If any adverse impacts on ecosystem are predicted, are adequate measures taken to reduce the impacts on ecosystem?	
	(3) Topography and Geology	① Is there a possibility that the installation of structures will cause a large-scale alteration of topographic features and geological structures around the project site?	

Environmental Checklist: 9. Chemical Manufacturing (3)

Category	Environmental Item	Main Check Items	Confirmation of Environmental and Social Considerations
4. Social Environment	(1) Resettlement	<p>① Are involuntary resettlement and loss of means of livelihoods avoidable by project implementation? If unavoidable, are efforts made to minimize the impacts caused by the resettlement and loss of means of livelihoods?</p> <p>② Are the people affected by the project provided with adequate compensation and supports to improve their standard of living, income opportunities, and production levels or at least to restore them to pre-project levels? Also, is prior compensation at full replacement cost provided as much as possible?</p> <p>③ Is the participation of the people affected and their communities promoted in planning, implementation, and monitoring of involuntary resettlement action plans and measures against the loss of their means of livelihood? In addition, will appropriate and accessible grievance mechanisms be established for the people affected and their communities?</p> <p>④ Is the resettlement action plan (including livelihood restoration plan as needed) prepared and disclosed to the public for the project which will results in a large-scale resettlement or large-scale loss of means of livelihood? Does the resettlement action plan include elements required in the standard of the international financial institution benchmarked in its environmental reviews?</p> <p>⑤ In preparing a resettlement action plan, is consultation made with the affected people and their communities based on sufficient information made available to them in advance and is explanations given in a form, manner, and language that are understandable to the affected people?</p> <p>⑥ Has appropriate consideration been given to vulnerable social groups, such as women, children, the elderly, the poor, and ethnic minorities in the resettlement action plan?</p> <p>⑦ Are agreements with the affected people obtained prior to the resettlement?</p> <p>⑧ Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the resettlement action plan?</p> <p>⑨ Is a plan developed to monitor the impacts of resettlement?</p>	
	(2) Living and Livelihood	<p>① Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?</p> <p>② Is there a possibility that large vehicle traffic for transportation of materials, such as raw materials and products will cause impacts on traffic in the surrounding areas and impede the movement of inhabitants, and cause risks to pedestrians?</p> <p>③ Is there a possibility that the amount of water used (e.g. surface water, groundwater) by the project will adversely affect the existing water uses and water area uses?</p> <p>④ Has appropriate consideration been given to vulnerable social groups, such as women, children, the elderly, the poor, ethnic minorities and indigenous peoples?</p>	
	(3) Heritage	<p>① Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage sites? Are adequate measures considered to protect these sites in accordance with the host country's laws?</p>	
	(4) Landscape	<p>① Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?</p>	

Environmental Checklist: 9. Chemical Manufacturing (4)

Category	Environmental Item	Main Check Items	Confirmation of Environmental and Social Considerations
4. Social Environment	(5) Ethnic Minorities and Indigenous Peoples	① Are the impacts to ethnic minorities and indigenous peoples avoidable by project implementation? If unavoidable, are efforts made to minimize the impacts and to compensate for their losses? ② If the project has adverse impacts on indigenous peoples' various rights in relation to land and resources, is such rights respected? ③ Is the indigenous peoples plan prepared and made public? Does the indigenous peoples plan include elements required in the standard of the international financial institution benchmarked in its environmental reviews? ④ In preparing the indigenous peoples plan, is consultation made with the affected ethnic minorities and indigenous peoples based on sufficient information made available to them in advance and are explanations given in a form, manner, and language that are understandable to them? ⑤ Are the free, prior, and informed consents of the indigenous peoples obtained?	
	(6) Working Conditions (including occupational safety)	① Is the project proponent not violating any laws and regulations associated with the working conditions of the host country which the project proponent should observe in the project? ② Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials? ③ Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public sanitation) for workers etc.?	
	(7) Community Health, Safety and Security	① Is there a possibility that diseases, including communicable diseases, such as HIV will be introduced due to immigration of workers associated with the project? Are adequate considerations given to public health, if necessary? ② Are appropriate measures being taken to ensure that security guards involved in the project do not violate safety of other individuals involved, or local residents?	
5. Other	(1) Impacts during Construction	① Are adequate measures considered to reduce impacts during construction (e.g. noise, vibrations, turbid water, dust, exhaust gases, and wastes)? ② If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts? ③ If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	
	(2) Accident Prevention Measures	① Are adequate accident prevention plans and mitigation measures developed to cover both the soft and hard aspects of the project, such as establishment of safety rules, installation of prevention facilities and equipment, and safety education for workers? Are adequate measures for emergency response to accidental events considered?	

Environmental Checklist: 9. Chemical Manufacturing (5)

Category	Environmental Item	Main Check Items	Confirmation of Environmental and Social Considerations
5. Other	(2) Accident Prevention Measures	② Are adequate accident prevention measures (e.g. installation of prevention facilities and equipment and establishment of prevention management framework) taken for storage, loading/unloading, and transportation of hazardous and dangerous materials?	
	(3) Monitoring	① Are the monitoring programs and environmental management plans of the project prepared? ② Are the items, methods and frequencies included in the monitoring program judged to be appropriate? ③ Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? ④ Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities? ⑤ Are the results of monitoring planned to be disclosed to the stakeholders of the project? ⑥ Is there a processing mechanism in place, for solving problems related to environmental and social considerations pointed out by third parties?	
6. Notes	(1) Reference to Checklists of Other Sectors	① For petrochemical manufacturing projects, the Petrochemicals checklist should be used. ② Where necessary, pertinent items described in the Ports and Harbors checklist should also be checked (e.g. projects including construction of ports and harbor facilities).	
	(2) Notes on Using Environmental Checklists	① If necessary, the impacts to transboundary or global issues should be confirmed (e.g. the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, and global warming). ② The chemicals used in chemical manufacturing differ depending on the specific process configuration. It should be confirmed that adequate environmental protection measures, including wastewater treatment for each process are implemented.	

- 1) Regarding the Standards for Confirmation of Appropriateness of Environmental and Social Considerations, confirm the background and rationale for deviation and the measures to rectify it if necessary, when the environmental and social considerations of the project substantially deviate from the World Bank Safeguard Policies or IFC Performance Standards and a relevant section of EHS Guidelines, and also where appropriate compare with the standards established by other international financial institutions, other internationally recognized standards, and/or standards or good practices established by developed countries such as Japan, in addition to environmental laws and standards of the host nation and local governments concerned. For standards that current regulations in the host country has not been established, examine by comparison with the international standards such as the World Bank Safeguard Policies and the standards of developed countries such as Japan.
- 2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete items taking into account the characteristics of the project and the particular circumstances of the country and locality, including the direct and immediate impact of projects, derivative, secondary, cumulative impact and impact of associated facilities, and the impact throughout the life cycle of the project.