DRAFT FOR CONSULTATION
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Environmental and Social Standard 4. Health, Safety and Security

NOTE: This document should be read in conjunction with the proposed ADB Environmental and Social Framework, which contains the full text of the Environmental and Social Policy (proposed responsibilities of the ADB), the 10 Environmental and Social Standards (proposed responsibilities of the Borrowers/Clients, and the Prohibited Investment Activities List (activities ineligible for ADB financing). This document is being circulated for consultation purpose only. Guidance from the ADB Board of Directors will be sought on this document as part of the Working Paper, scheduled in Q4 2023.
ESS 4: HEALTH SAFETY AND SECURITY

I. INTRODUCTION

1. This Environmental and Social Standard (ESS) 4 recognizes that project activities, equipment, and infrastructure may increase the potential for project workers and project-affected persons to be exposed to health, safety, and security risks. Project activities may also exacerbate natural hazard and climate change risks or impacts on project-affected persons.

2. This ESS4 recognizes that the borrower/client has the primary responsibility, in collaboration with competent government authorities, to manage health, safety, and security risks associated with project activities that impact project workers and project-affected persons to avoid or minimize such risks and impacts, with particular attention to those who may be disadvantaged or vulnerable.

II. OBJECTIVES

a. Protect and promote the health, safety, and security of project workers by promoting a culture of safety, ensuring safe, healthy, and secure working conditions, and implementing protective measures proportionate to the nature and scale of the potential risks and impacts of a project;

b. Anticipate and avoid and, where avoidance is not possible, establish measures and procedures to minimize, mitigate, and respond to, adverse impacts on the health, safety, and security, including sexual exploitation, abuse, and harassment (SEAH)-related issues, of project workers and project-affected persons;

c. Consider potential geophysical and physical climate risks and impacts in the design and construction of infrastructure;

d. Avoid, or where avoidance is not possible, minimize and mitigate the exposure of persons and communities to project-related traffic and road safety hazards, diseases, and hazardous chemicals, substances, materials, and wastes;

e. Ensure that the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to project workers and project-affected persons.

III. SCOPE OF APPLICATION

3. The applicability of this ESS4 is established during the environmental and social (E&S) assessment process as described in ESS1. The potential risks to project workers and project-affected persons may vary depending on the nature, scale, and stage of a project. This ESS4 establishes requirements for ensuring the health, safety, and security of project workers and project-affected persons.

IV. REQUIREMENTS

A. General Requirements for Ensuring Health and Safety

4. The borrower/client will adopt measures to prevent fatality, accident, injury, and ill-health among project workers and project-affected persons, arising from or associated with a project. The borrower/client will, in consultation with ADB, prepare and implement plans with detailed
measures to manage health and safety risks in accordance with the mitigation hierarchy, the host country’s applicable laws, including those laws implementing host country obligations under international laws, and applicable internationally recognized standards such as the World Bank Group Environmental, Health, and Safety Guidelines (EHSGs) or good international practice (GIP). Where the requirements under the host country’s applicable laws differ from such internationally recognized standards, the borrower/client will achieve whichever is more stringent or more protective for project workers and project-affected persons or the environment.

5. The borrower/client will undertake, as part of the E&S assessment process described in ESS1, a health, safety, and security assessment proportionate to the nature and scale of the potential risks and impacts of a project and develop a project-specific health and safety management plan (HSMP) that may be a standalone plan or may be integrated into the project environmental and social management plan (ESMP) or any relevant management tools. The borrower/client will liaise with the contractor to update and regularly review the HSMP to evaluate its effectiveness in avoiding, reducing, and mitigating risks and impacts.

6. The borrower/client will provide project workers and project-affected persons with information, guidance, instruction, and training relating to health and safety hazards, risks, and emergency arrangements that are necessary for their health and safety during the preparation and implementation phases of a project cycle.

7. If there are significant changes to a project that result in additional risks for and impacts on the health, safety, and security of project workers and project-affected persons, the borrower/client will meaningfully consult with project workers and project-affected persons on how to mitigate these risks and impacts and on any additional mitigation measures that may be required.

8. The borrower/client will require that all project workers, contractors and subcontractors or other third-party contractors engaged on a project operate in a manner consistent with the requirements of this ESS4.

B. Occupational Health and Safety

9. The borrower/client will provide project workers with a safe and healthy workplace, taking into account inherent risks in its particular sector and specific classes of hazards that may be present.

10. Where there are specific risks associated with certain work activities that could result in adverse effects on the health and safety of disadvantaged or vulnerable project workers, the borrower/client will carry out more detailed risk assessment and integrate the findings and the related occupational health and safety (OHS) measures into the HSMP.

11. The borrower/client will designate a person responsible for OHS, who will implement the HSMP. The borrower/client will require its non-employee project workers, contractors, and other third parties on project sites to also comply with the HSMP. The borrower/client will provide personal protective equipment and access to safety equipment at no cost to project workers.

12. During the course of any work activity, the borrower/client will ensure that project workers are dully qualified and competent to undertake assigned tasks, are provided with continued and appropriate supervision to ensure safe use of work equipment, and adequate implementation and enforcement of the HSMP.
13. The borrower/client will monitor the health and safety of project workers and meaningfully consult with them on OHS related measures in the HSMP. The borrower/client will ensure that this monitoring and meaningful consultation includes, at a minimum, accident investigation, risk assessment, development of safe methods and procedures of work, and selection of work equipment. The borrower/client will encourage project workers to stop work in situations of imminent danger and report any unsafe acts and conditions in the workplace.

14. The borrower/client will put in place workplace processes including a grievance mechanism for project workers to report work situations that they believe are not safe or healthy, and to enable them to remove themselves from a work situation which they have reasonable justification to believe presents an imminent and serious danger to their life or health. Project workers who remove themselves from such situations will not be required to return to work until necessary remedial action to correct the situation has been taken.

15. Where project workers are employed or engaged by more than one party and are working together in one location, the borrower/client will require that the parties who employ or engage the workers will collaborate in applying the OHS related measures in the HSMP, without prejudice to the responsibility of each party for the health and safety of its own workers.

16. The borrower/client will regularly review and monitor the implementation of the OHS related measures in the HSMP. The review will include identification of safety and health hazards and risks, implementation of effective methods for responding to identified hazards and risks, setting priorities for taking action, and evaluation of results.

C. Community Health and Safety

17. The borrower/client will identify and assess project-related risks and adverse impacts on the health and safety of potential project-affected persons throughout the concept design, preparation, and implementation phases of a project cycle. The borrower/client will avoid such risks and impacts, and where avoidance is not possible, develop preventive and protective measures for community health and safety proportionate to the nature and scale of a project, and incorporate such measures into the HSMP. The borrower/client will communicate with project-affected persons and other stakeholders, as appropriate, on the community health and safety related measures within the HSMP. The borrower/client will ensure that such measures are consistent with the mitigation hierarchy and GIP.

18. Where there are specific risks that could result in adverse impacts on the health and safety of disadvantaged or vulnerable persons, the borrower/client will carry out a more detailed risk assessment and develop measures to manage the risks, including preventing injury and ill health, and include them in the HSMP.
V. SPECIFIC REQUIREMENTS FOR HEALTH AND SAFETY MANAGEMENT

D. Reporting of Accidents and Injuries including Fatalities

19. Where any fatality, accident, injury, or ill-health occur in the course of implementing project activities, or there is a potential of such occurrence, the borrower/client will investigate, document, and analyze the findings, adopt measures to prevent occurrence or recurrence and, where required by law, notify and cooperate with the competent government authorities. The borrower/client will report to ADB any major incident, fatality, or significant injury within three working days of its occurrence or when it became aware of, followed up by a detailed report outlining root cause analysis and future preventative measures and actions within 21 working days. In circumstances where it is not possible to complete the detailed report, the borrower/client and ADB will agree on a more feasible date. The borrower/client will require its contractor(s) to record and maintain an accident and incident register throughout the project construction and implementation phases. For any fatality, accidents, injury, or ill-health caused by project activities, the borrower/client will provide appropriate compensation in accordance with the requirements of the host country’s applicable laws, and, if relevant, a GIP.

E. Safety of Services

20. Where a project involves provision of services to communities, the borrower/client will establish and implement appropriate health and safety and quality control measures to anticipate and minimize risks and impacts that such services may have on community health and safety. The borrower/client will consider features that will permit access and use to the greatest extent possible by people in the communities regardless of their age, size, ability or disability, where technically and financially feasible.

F. Exposure to Disease

21. The borrower/client will avoid or minimize the potential exposure of project workers and project-affected persons to diseases which could result from, or be exacerbated by, project activities. The borrower/client will take into consideration differentiated exposure to, and higher sensitivity of, disadvantaged or vulnerable groups and will develop appropriate mitigation measures in meaningful consultation with such groups and the competent government authorities.

22. Where specific diseases are endemic to the geographic area of project-affected communities, the borrower/client is encouraged to identify opportunities throughout the concept design, preparation, and implementation phases of a project cycle to improve conditions that could help minimize their incidence, both among project workers and project-affected persons. The borrower/client will take measures to avoid or minimize transmission of communicable diseases that may be associated with the influx of project workers.

G. Ecosystem Service

23. A project’s direct impacts on provisioning and regulating ecosystem services, including those that may be exacerbated by climate change, may result in adverse health and safety risks to and impacts on biodiversity and project-affected persons. The borrower/client will ensure that adverse impacts on such ecosystem services are avoided and, where avoidance is not possible, will implement appropriate mitigation measures.
H. Natural Hazards

24. The borrower/client will identify and assess the potential risks and impacts from extreme weather and geophysical hazards, as these relate to a project and will design and implement measures to avoid and/or minimize their impact. The borrower/client will also avoid or minimize the exacerbation of risks and impacts caused by natural hazards, such as landslides or floods, that could result from land use changes due to project activities.

25. The borrower/client will undertake a climate risk assessment in accordance with ESS9. The borrower/client will identify and assess alternatives to a project’s proposed location and/or technology and identify appropriate climate change mitigation, and climate change adaptation and resilience measures to be integrated into the project design.

I. Sexual Exploitation, Abuse, and Harassment (SEAH)

26. The borrower/client will assess project-related risks of SEAH to project workers consistent with ESS2 and project-affected persons, including those who may be disproportionately affected because of their disadvantaged or vulnerable status. The borrower/client will adopt specific and differentiated measures to prevent and address SEAH, following a survivor-centered approach, and will establish a confidential grievance mechanism for reporting incidents and referral systems to provide support to SEAH survivors.

J. Product Safety

27. Where a project involves production of and/or trade in consumer products, the borrower/client will ensure product safety through good design and manufacturing processes, as well as adequate storage, handling, and transportation for product distribution. The borrower/client will comply with the requirements of the host country’s applicable laws and the product safety standards and codes of practice in a given business sector, as agreed with ADB.

28. During the assessment process, the borrower/client will identify and evaluate health and safety risks to consumers associated with its products. The borrower’s/client’s approach to product safety will adhere to the mitigation hierarchy and ensure that adequate information on a product’s health and safety risks is provided to consumers. For situations involving products which may pose serious health threats, the borrower/client will ensure that product recall and product withdrawal policies and procedures are in place before product distribution to consumers.

K. Infrastructure, Building and Equipment Design and Safety

29. During the concept design, preparation, and implementation phases of a project cycle, the borrower/client will ensure that structural elements of a project comply with the requirements of the host country’s applicable laws and, if relevant GIP, taking into consideration health, safety, and security risks to project-affected persons and other stakeholders. The borrower/client will ensure that structural elements of a project are designed, constructed, and certified by competent professionals and approved by competent government authorities, and that structural design takes potential climate change-related risks and impacts into account, as appropriate.

30. Where a project includes new buildings and structures that will be accessed by members of the public, the borrower/client will consider the incremental risks of the public’s potential exposure to operational incidents or natural hazards. Where technically and financially feasible,
the borrower/client will consider features that will permit access and use to the greatest extent possible by people in the communities regardless of their age, ability or disability.

31. When structural elements or components of a project are situated in high-risk locations, including those with risk of extreme weather, geophysical hazards, or slow onset events, and their failure or malfunction may threaten the health, safety, and security of project workers and project-affected persons, the borrower/client will engage one or more experts with recognized experience in similar situations and projects, who are independent from those responsible for project-related design and construction. The borrower/client will ensure that these independent experts conduct a review as early as possible in project concept design or preparation phases to confirm the safety and structural integrity of structural elements or components and will monitor their safety and structural integrity throughout the implementation phase of a project cycle. Where a project involves a new or existing dam, the borrower/client will provide sufficient resources to apply the requirements for safety of dams, as set out in Annex 1.

L. Traffic and Road Safety

32. The borrower/client will identify, evaluate, and monitor the potential traffic and road safety risks to project workers, project-affected persons, and road users throughout the concept design, preparation, and implementation phases of a project cycle and will incorporate technically and financially feasible road safety measures into a project.

33. Where appropriate, the borrower/client will undertake a road safety assessment for each phase of a project, monitor incidents and accidents, and prepare regular reports of such monitoring as determined by the requirements of ESS1. The borrower/client will use the reports to identify negative safety issues and establish and implement measures to resolve them.

34. For vehicles or fleets of vehicles owned or leased for the purposes of a project, the borrower/client will put in place appropriate systems, including procedures for driver training, to improve driver and vehicle safety, as well as for maintenance and repair, monitoring, and enforcement. The borrower/client will consider the safety record or rating of vehicles in purchase or leasing decisions and require regular maintenance of all vehicles owned or leased for a project.

35. For projects that operate construction and other equipment on public roads or where the use of project equipment could have an impact on public roads or other public infrastructure, the borrower/client will take appropriate safety measures to avoid the occurrence of incidents and injuries to members of the public associated with the operation of such equipment.

M. Management and Safety of Hazardous Chemicals, Substances, Materials, and Wastes

36. The borrower/client will avoid or reduce the potential for exposure of project workers and project-affected persons to hazardous chemicals, substances, materials, and wastes that may be used in or released by a project. Where there is a potential for project workers and project-affected persons to be exposed to hazardous chemicals, substances, materials, or wastes, the borrower/client will exercise due care to manage their exposure by eliminating, substituting, or isolating the activities that use or release the hazardous chemicals, substances, materials, or wastes.

37. Where use of hazardous chemicals, substances, and materials and the generation of hazardous waste cannot be avoided, the borrower/client will take necessary measures for safe
and secure handling, storage, transport, and disposal in accordance with GIP and will implement measures to avoid or reduce the exposure of project workers and project-affected persons. Where a project includes hazardous chemicals, materials, substances, or wastes that are part of existing facilities or activities, an E&S audit will be undertaken to identify risks and impacts and identify measures and actions required in accordance with ESS1, to prevent exposure of project workers and project-affected persons to them.

N. Emergency Preparedness and Response

38. The borrower/client will identify and implement measures to address emergency. The borrower/client will ensure that measures are designed to address an emergency in a coordinated and expeditious manner, in accordance with the requirements under the host country’s applicable laws, and to minimize, mitigate, and compensate for any adverse impacts that may occur to the health, safety, and security of project workers and project-affected persons.

39. Borrowers/clients engaged in projects having the potential to generate emergency will conduct a risk hazard assessment as part of the assessment process described in ESS1. Based on the results of such assessments, the borrower/client will prepare an emergency response plan (ERP) in coordination with the competent local authorities, project workers, and project-affected persons.

40. The borrower/client will document project emergency preparedness and response activities, resources, and responsibilities, and will disclose appropriate information, as well as any subsequent material changes, to project workers, project-affected persons, and competent government authorities. The borrower/client will assist and collaborate with project workers, project-affected persons, competent government authorities, and other stakeholders in their preparations to respond effectively to an emergency, especially where their participation and collaboration will be an important part of an effective response.

41. The borrower/client will review the ERP on a regular basis throughout the implementation phase of a project cycle and confirm that it addresses the potential range of emergency that might arise in connection with a project. The borrower/client will support project workers, project-affected persons, and competent government authorities, through training and other collaboration on emergency preparedness.

O. Security Management

42. The borrower/client will identify and assess project security threats to project workers and project-affected persons. Where risks are identified, the borrower/client will implement security management arrangements that are proportionate to the nature and scale of the threats.

43. When a borrower/client retains employees or contractors to provide security services for its personnel and property, it will assess risks posed by the security arrangements to those within and outside a project site and implement and monitor a security management plan that is proportionate to the nature and scale of the assessed risks. In making such arrangements, the borrower/client will ensure that security personnel are hired in accordance with the host country’s applicable laws.

44. The borrower/client will: (i) make reasonable efforts to verify that the employees or contractors it retains to provide security services are not implicated in past abuses, including those related to SEAH; (ii) train them adequately or determine that they are properly trained in
appropriate conduct toward project workers and project-affected persons; (iii) train them adequately or determine that they are properly trained in the use of force and, where applicable, firearms; and (iv) require them to comply with the requirements of the host country’s applicable laws. The borrower/client will not sanction any use of force by security personnel except for preventive and defensive purposes proportionate to the nature and extent of the threat.

45. If security services are the responsibility of government authorities, the borrower/client will collaborate, to the extent permitted, with the competent government authorities to achieve outcomes that are consistent with this ESS. The borrower/client will communicate to the competent government authorities its intent that the security personnel act in a manner consistent with para 43 and encourage the competent government authorities to disclose the security arrangements for the borrower’s/client’s facilities to the public, subject to overriding security concerns.

46. The borrower/client will establish and maintain an effective grievance mechanism as described in ESS10 to allow project workers and project-affected persons to express concerns about security arrangements and the actions of security personnel and will inform project workers and project-affected persons of the availability and use of the grievance mechanism.

47. The borrower/client will investigate any allegations of unlawful or abusive acts by security personnel, take action or urge appropriate parties to take action to prevent recurrence, and report unlawful and abusive acts to competent government authorities and to ADB.

VI. MONITORING AND DISCLOSURE

48. Depending on the level of risks and impacts with regards to the health, safety and security of project workers and project-affected persons, the borrower/client may prepare additional studies and management tools that are required through this ESS4 and as relevant to a project and its risks and impacts. As described in ESS1, these will support the analysis of impacts and identification of mitigation measures and will be part of or may be annexed to the E&S assessment undertaken for a project.

49. The management tools as required by this ESS4 may include the cultural heritage management plan (CHMP), ERP, and the security management plan, and all of which may be prepared and disclosed as standalone documents or as part of the project ESMP.

50. The borrower/client will monitor the implementation of the management tools prepared under this ESS4 in accordance with the requirements in the environmental and social commitment plan (ESCP)/environmental and social action plan (ESAP) and ESS10.
Annex 1: Safety of Dams

A. NEW DAMS

1. The borrower/client will engage experienced and competent professionals for the supervision of the design and construction of new dams, and require the owner of a dam to adopt and implement dam safety measures during the design, bid tendering, construction, operation, and maintenance of the dam and associated works.

2. The dam safety requirements set out in this Annex apply to:

   (i) Large dams, which are defined as dams with a height of 15 meters or greater from the lowest foundation to crest or dams between 5 meters and 15 meters impounding more than 3 million cubic meters;

   (ii) Small dams, which are all other dams regardless of size or retention capacity that (i) could cause safety risks, such as an unusually large flood-handling requirement, location in a zone of high seismicity, foundations that are complex and difficult to prepare, retention of toxic materials, or potential for significant downstream impacts; or (ii) are expected to become large dams during their operating life.

3. The dams referred to in para 2 of this Annex require:

   (i) Reviews by an independent dam safety panel of experts of the investigation, design, and construction of the dam and the start of operations;

   (ii) Preparation and implementation of detailed plans, as described in Section C, including; a plan for construction supervision and quality assurance, an instrumentation plan, an operation and maintenance plan, and an emergency preparedness plan. Note that as part of established dam safety practices in some countries, the operation and maintenance (O&M) plan includes the instrumentation plan and the emergency preparedness plan as specific sections of the O&M plan. This method will be acceptable provided the relevant sections of the O&M plan contain the details, and are prepared in accordance with the timing set out in Section C overleaf.

   (iii) Prequalification of bidders during procurement and bid tendering if suggested as an outcome of the strategy procurement process; and

   (iv) Periodic safety inspections of the dam after completion, and implementation of measures required to address safety deficiencies.

4. The risks associated with a dam are design- and situation-specific, and will vary depending on structural components, socioeconomic factors, and the environment within which the dam is being constructed and will operate. Application of the requirements set out in para 3 of this Annex will reflect these considerations, and be proportionate to the size, complexity, and potential risk of a dam.

5. Where a dam does not fall into the categories set out in para 2 of this Annex, such as farm ponds, local silt retention dams, and low embankment tanks, the borrower/client will adopt and implement dam safety measures designed by qualified engineers in accordance with GIP. In such circumstances, the borrower will confirm, through the E&S assessment process under ESS1, that there will be no or only negligible risk of significant adverse impacts due to potential failure of the dam structure to local communities and assets, including assets to be financed as part of a proposed project.
6. The panel referred to in para 3(i) of this Annex consists of three or more experts, appointed by the borrower/client and acceptable to ADB, with expertise in the various technical fields relevant to the safety aspects of a particular dam. The number, professional breadth, technical expertise, and experience of panel members are proportionate to the size, complexity, and hazard potential of the dam under consideration. For high-hazard dams, in particular, the panel members will possess recognized international expertise in their field. The panel will review and advise the borrower/client on matters relative to dam safety and other critical aspects of a dam, its appurtenant structures, the catchment area, the area surrounding the reservoir, and downstream areas. The borrower/client will normally extend the panel’s composition and terms of reference beyond dam safety, to cover such areas as project formulation, technical design, construction procedures, and, for water storage dams, associated works such as power facilities, river diversion during construction, ship lifts, and fish ladders.

7. The borrower/client will contract the services of the panel and will provide administrative support for its activities. Beginning as early in project preparation as possible, the borrower/client will arrange for periodic panel meetings and reviews, which will continue through the investigation, design, construction, and initial filling and start-up phases of a dam. If ADB’s involvement begins at a later stage than project preparation, the panel is constituted as soon as possible and reviews any aspects of the project that have already been carried out. The borrower/client will inform ADB in advance of panel meetings and ADB may send an observer to these meetings. After each meeting, the panel will provide the borrower/client with a written report of its conclusions and recommendations, signed by each participating member, and the borrower/client will provide a copy of the panel’s report to ADB for disclosure in accordance with ESS9. Following the filling of the reservoir and start-up of a dam, ADB will review the panel’s findings and recommendations. If no significant difficulties are encountered or anticipated in the filling and start-up of a dam, the borrower/client may disband the panel.

B. EXISTING DAMS AND DAMS UNDER CONSTRUCTION

8. Where a project relies or may rely on the performance of an existing dam or a dam under construction in the host country, the borrower/client will arrange for one or more independent dam specialists to: (i) inspect and evaluate the safety status of the existing dam or dam under construction, its appurtenances, and its performance history; (ii) review and evaluate the owner’s operation and maintenance procedures; and (iii) provide a written report of findings and recommendations for any remedial work or safety-related measures necessary to upgrade the existing dam or dam under construction to an acceptable standard of safety.

9. Such projects include, for example, power stations or water supply systems that draw directly from a reservoir controlled by an existing dam or a dam under construction; diversion dams, or hydraulic structures downstream from an existing dam or a dam under construction, where failure of the upstream dam could cause extensive damage to or failure of the project facilities; and irrigation or water supply projects that will depend on the storage and operation of an existing dam or a dam under construction for their supply of water and could not function if the dam failed. They also include projects that require increases in the capacity of an existing dam, or changes in the characteristics of the impounded materials, where failure of the existing dam could cause extensive damage to or failure of project facilities.

10. The borrower/client may use a previously prepared dam safety assessment or recommendations for improvements needed in an existing dam or dam under construction, if: (i) an effective dam safety program is already in operation; and (ii) full-level inspections and dam
safety assessments of the existing dam or dam under construction have already been conducted and documented and are satisfactory to ADB.

11. For projects that include additional dam safety measures or require remedial work, the borrower/client will require that: (i) a dam is designed and its construction is supervised by competent professionals; and (ii) the reports and plans required for a new dam, as specified in para 3(ii) of this Annex are prepared and implemented. For high-hazard cases involving significant and complex remedial work, the borrower/client will also employ a panel of independent experts on the same basis as for a new dam, as required in paras 3(i) and 6 of this Annex.

12. When the owner of an existing dam or dam under construction is an entity other than the borrower/client, the borrower/client will enter into agreements or arrangements providing for the measures set out in paras 8 to 11 of this Annex to be undertaken by the owner.

13. Where appropriate, the borrower/client may discuss with ADB any measures necessary to strengthen the institutional, legislative, and regulatory frameworks for dam safety programs in the host country.

C. DAM SAFETY REPORTS

14. Dam safety reports will contain the information set out below and be prepared as follows:

   (i) **Plan for construction supervision and quality assurance.** This plan will set out details of the organization, staffing levels, procedures, equipment, and qualifications for supervision of the construction of a new dam or of remedial work on an existing dam. For a dam other than a water storage dam, this plan takes into account the usual long construction period, covering the supervision requirements as the dam grows in height — with any accompanying changes in construction materials or the characteristics of the impounded material — over a period of years. The borrower/client will prepare and submit this plan to the panel and ADB during project preparation.

   (ii) **Instrumentation plan.** This is a detailed plan for the installation of instruments to monitor and record dam behavior and the related hydrometeorological, structural, and seismic factors. The borrower/client will prepare and submit this plan to the panel and ADB before bid tendering.

   (iii) **Operation and maintenance (O&M) plan.** This plan will set out details of the organizational structure, staffing, technical expertise, and training required, equipment and facilities needed to operate and maintain a dam, O&M procedures, and arrangements for funding, including long-term maintenance and safety inspections. The O&M plan for a dam other than a water storage dam, in particular, will reflect changes in the dam’s structure or in the nature of the impounded material that may be expected over a period of years. Elements required to finalize the plan and initiate operations are normally financed under a project. The borrower/client will prepare a preliminary plan and submit it to the panel and ADB during project preparation. The borrower/client will refine and complete this plan during project implementation. The borrower/client will complete the final plan not less than six months prior to the start of the initial filling of the reservoir. Elements required to finalize the plan and initiate operations are normally financed under a project.
Emergency preparedness and response plan. This plan will specify the roles of responsible parties when dam failure is considered imminent, or when expected operational flow release threatens downstream life, property, or economic operations that depend on river flow levels. It will include the following: clear statements on the responsibility for decision-making relating to dam operations and for the related emergency communications; maps outlining inundation levels for various emergency conditions; flood warning system characteristics; and procedures for evacuating threatened areas and mobilizing emergency forces and equipment. The plan for emergency communication will include the mechanism through which potentially affected downstream communities will be informed. The borrower/client will prepare the broad framework plan and an estimate of funds needed to prepare the plan in detail and submit it to ADB during project preparation and prior to approval. The borrower/client will prepare the plan itself during implementation and submit it to the panel and ADB for review not later than one year before the projected date of initial filling of the reservoir.