

**GUIDANCE
NOTE FOR
BORROWERS**

**Environmental &
Social Framework
for IPF Operations**

**ESS4:
Community
Health and
Safety**

The Guidance Notes provide guidance for the Borrower on the application of the Environmental and Social Standards (ESSs), which form part of the World Bank's 2016 Environmental and Social Framework (ESF). The Guidance Notes help to explain the requirements of the ESSs; they are not Bank policy, nor are they mandatory. The Guidance Notes do not substitute for the need to exercise sound judgment in making project decisions. In case of any inconsistency or conflict between the Guidance Notes and the ESSs, the provisions of the ESSs prevail. Each paragraph of the Standard is highlighted in a box, followed by the corresponding guidance.

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Introduction

1. ESS4 recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. In addition, communities that are already subjected to impacts from climate change may also experience an acceleration or intensification of impacts due to project activities.

2. ESS4 addresses the health, safety, and security risks and impacts on project-affected communities and the corresponding responsibility of Borrowers to avoid or minimize such risks and impacts, with particular attention to people who, because of their particular circumstances, may be vulnerable.

Objectives

- To anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle from both routine and nonroutine circumstances.
- To promote quality and safety, and considerations relating to climate change in the design and construction of infrastructure, including dams.
- To avoid or minimize community exposure to project-related traffic and road safety risks, diseases, and hazardous materials.
- To have in place effective measures to address emergency events.
- To ensure that the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities.

Scope of Application

3. The applicability of this ESS is established during the environmental and social assessment described in ESS1.

4. This ESS addresses potential risks and impacts on communities that may be affected by project activities. Occupational health and safety (OHS) requirements for project workers are set out in ESS2, and measures to avoid or minimize impacts on human health and the environment due to existing or potential pollution are set out in ESS3.

Requirements

A. Community Health and Safety

5. The Borrower will evaluate the risks and impacts of the project on the health and safety of the affected communities during the project life cycle, including those who, because of their particular circumstances, may be vulnerable. The Borrower will identify risks and impacts and propose mitigation measures in accordance with the mitigation hierarchy.

GN5.1. A health impact assessment can be conducted as part of the environmental and social assessment.

GN5.2. Some groups within a community may be particularly vulnerable to health and safety risks from a project because of, for example, their age, health, level of education, occupation, socioeconomic conditions, status, gender, and/or disability. Identifying individual groups considered to be vulnerable is an important part of the environmental and social assessment, and enables inclusive measures to be incorporated into projects to avoid harm to vulnerable groups and improve project performance. Attention should be given to the health and safety risks posed by the influx of workers or people providing support services into an area as a result of the project. Risks related to labor influx are known to be potentially highest for large infrastructure projects in remote areas.

GN5.3. Where an assessment identifies risks, for example Gender-Based Violence (GBV) or Sexual Exploitation and Abuse (SEA) of children, or communicable diseases, which may arise from the interaction of project workers with local communities, the environmental and social documents for the project describe such risks and measures to address them. Such measures can include, more generally, the use of skilled trainers to raise awareness among project workers of the risks, expected behaviors, and consequences of violations, communicated through training, and publicized codes of conduct. It may also be important to raise awareness of the risks among community members and local health authorities and inform them about available grievance mechanisms. Where appropriate, the risks and mitigation measures relating to project workers should also be reflected in the labor management procedures for the project as discussed in GN9.4 of ESS2.

GN5.4. Addressing community health and safety risks may require measures in all phases of the project life cycle, for example, incorporating safe road crossings into project design; establishing workers' camps separated from local communities with strict protocols for interaction with local communities in order to avoid project impacts from labor influx; implementing sensitization and specific mitigation measures for social impacts from labor influx during construction or service provision of the project; establishing emergency-response planning and monitoring for pollution or other incidents during operation; putting in place protocols for temporary blasting during demolition at the reinstatement or restoration phase; or establishing health clinics. Local health authorities should ensure appropriate processes are in place for community feedback and taking any necessary action.

Infrastructure and Equipment Design and Safety

6. The Borrower will design, construct, operate, and decommission the structural elements of the project in accordance with national legal requirements, the EHSs and other GIIP, taking into consideration safety risks to third parties and affected communities. Structural elements of a project will be designed and constructed by competent professionals, and certified or approved by competent authorities or professionals.¹ Structural design will take into account climate change considerations, as appropriate.

Footnote 1. This may include, where appropriate, third-party life and fire safety audits for existing buildings that are used for communal purposes and for new buildings prior to their commissioning or use.

GN6.1. "Structural elements" are the physical parts of the project. They may include existing or new buildings, earthworks, bridges, retaining walls, drainage ditches, roadways, penstocks, water and irrigation channels, pylons, air conditioning units, power stations, electrical utility lighting, transmission and distribution poles (and their potential need for relocation), underground utilities, and dams. They would include other critical structures, for example, structures that are at risk for flooding.

GN6.2. Third parties referred to in ESS4 may include members of the public, businesses, or users of infrastructure that are not considered affected communities.

GN6.3. The certification or approval process by competent authorities or professionals reflects the risk of adverse consequences posed by the nature and use of the structural elements, and the natural conditions of the area (for example, potential for hurricanes, earthquakes, flooding, extreme temperatures). The process also takes into account the relevant engineering safety considerations, such as geotechnical, structural, electrical, and mechanical specifications. In situations where the governmental regulatory capacity to provide "competent authority certification" may be limited, external professionals who are competent to certify or approve structural elements of the project should maintain independence from the project implementer, as they are undertaking inherently governmental functions. Similar considerations apply in determining whether third-party life and fire safety audits are required. The certification and approval of some structural elements will, in some cases, go beyond local regulatory requirements.

GN6.4. The types of measures that can be incorporated to reflect climate change considerations and other risk conditions such as flooding are discussed in more detail in the Environmental, Health and Safety Guidelines (EHSs) and Good International Industry Practice (GIIP).

7. Where the project includes new buildings and structures that will be accessed by members of the public, the Borrower will consider the incremental risks of the public's potential exposure to operational accidents or natural hazards, including extreme weather events. Where technically and financially feasible, the Borrower will also apply the concept of universal access² to the design and construction of such new buildings and structures.

Footnote 2. The concept of universal access means unimpeded access for people of all ages and abilities in different situations and under various circumstances, as set out in GIIP.

GN7.1. Where national laws or regulations have mandatory requirements on accessibility, these are incorporated into the design of the project, together with any additional measures needed to meet the universal accessibility requirements of footnote 2.

GN7.2. When applying the concept of universal access in the design and construction of new buildings and structures, such as schools, public facilities, or roads, where technically and financially feasible, the project should, among other things:

- (a) Consider universal access as part of the project design;
- (b) Seek input from stakeholders, such as potential users of the buildings and structures and organizations representing disabled people;
- (c) Explicitly incorporate into procurement documents considerations relating to universal access; and
- (d) Consider local accessibility standards, and codes on universal access and nondiscrimination.

GN7.3. Examples of measures to support universal access in buildings or structures include sidewalks with ramps and drop curbs, clear and visible signs, tactile strips, audible announcement of signs, appropriate placement and height of equipment, easily identified emergency exits, raised toilet seats and handrails, and wide doors.

8. When structural elements or components of a project are situated in high-risk locations, including those with risk of extreme weather or slow onset events, and their failure or malfunction may threaten the safety of communities, the Borrower will engage one or more independent experts with relevant and recognized experience in similar projects, separate from those responsible for the design and construction, to conduct a review as early as possible in project development and throughout the stages of project design, construction, operation, and decommissioning. Where the project involves a new or existing dam, the Borrower will provide sufficient resources to apply the requirements on safety of dams, as set out in Annex A.

GN8.1. Examples of high-risk locations include those where communities are vulnerable to failure or malfunction of structural elements of the project because of a heightened level of environmental risk, for example, from earthquakes, landslides, drought, floods, cyclones, wildfires, and storms. High-risk locations may also include areas of high social risk such as armed conflict or criminal activity, where functioning electricity for lighting, communications, or road infrastructure may be a structural element that is critical for community health and safety, particularly for women and children and other vulnerable groups. Slow onset changes because of climate change may include changing current patterns, sea level rise, increasing temperatures, and desertification. Where such situations are relevant to the project, appropriate experts are engaged based on the significance and type of risks, and the assessment that may be required.

Safety of Services

9. Where the project involves provision of services to communities, the Borrower will establish and implement appropriate quality management systems to anticipate and minimize risks and impacts that such services may have on community health and safety. In such circumstances, the Borrower will also apply the concept of universal access, where technically and financially feasible.

GN9.1. Projects may provide many kinds of services to communities, such as those relating to education and health, social security and social protection, transport, and utilities, such as electricity and gas, water and sanitation, and waste disposal. Management systems that address the safety of such services are important because without adequate protection measures the provision of such services can present dangers for communities. Such systems address the community health and safety risks posed by project services, for example, risks associated with:

- (a) Water or irrigation canals, such as drowning, flooding, or water-related diseases;
- (b) Waste disposal, such as toxicity, waste dump collapse, or air pollution;
- (c) Quarries or excavation works, such as rock falls or hazardous equipment;
- (d) Water and sanitation services, such as contaminated water or spread of disease;
- (e) Electricity supply, which may result in electric shock from electrical cabinets or cables;
- (f) Service providers, which may use their service for the purpose of financial, sexual, or other exploitation, particularly of vulnerable groups such as women, children, and the elderly.

GN9.2. Management systems allow for timely identification of community health, and safety risks, and are designed to provide for compliance with national and internationally recognized environmental, health, and safety standards. The system should set out as a minimum the organizational arrangements and responsibilities for hazard identification and assessment; and process for monitoring and managing risks; and the processes for developing and monitoring of appropriate mitigation measures during the design, construction, operation, or provision of such services. These systems should take into account project-related risks as well as external risks that may impact the project. In the event that such management systems are not in place at the start of the project identification, they could be developed as part of the project.

Traffic and Road Safety

10. The Borrower will identify, evaluate, and monitor the potential traffic³ and road safety risks to workers, affected communities, and road users throughout the project life cycle and, where appropriate, will develop measures and plans to address them. The Borrower will incorporate technically and financially feasible road safety measures into the project design to prevent and mitigate potential road safety risks to road users and affected communities.

Footnote 3. May include all motorized transportation relevant to the project.

GN10.1. Motorized transportation covers different kinds of transportation used in a project, which primarily concerns roads, but may also include air and sea traffic.

11. Where appropriate, the Borrower will undertake a road safety assessment for each phase of the project, and will monitor incidents and accidents, and prepare regular reports of such monitoring. The Borrower will use the reports to identify negative safety issues, and establish and implement measures to resolve them.

GN11.1. Projects may involve construction of new roads or rehabilitation or structural changes/improvements to existing roads, which can create traffic and road safety risks. Indirect changes to traffic flow or volume on an existing road may also create risks, for example, when construction of a new bypass leads to increased traffic speeds on local roads due to reduced congestion. Communities affected by traffic and road safety issues include those alongside or bisected or fragmented by a road associated with the project. Shops, stalls, and residential properties may all be affected, along with people present on the road itself, whether nonmotorized (pedestrians and cyclists) or motorized (on motorcycles, or in cars, trucks, or buses).

GN11.2. For projects that affect traffic flow or volume on existing roads, the environmental and social assessment considers the risks arising from the proposed changes, paying attention to vehicle mix, volume, speed, and condition (including vehicle weight, height, length, and any hazardous materials likely to be carried). Other aspects to be considered include lane widths, slopes, speed management, roadside uses, pedestrian usage and facilities, air pollution, and any risks that these may pose.

GN11.3. The identification of risks begins at project identification, so that measures to address potential risks can be incorporated into the project design. As part of the environmental and social assessment, aspects of the project design, such as junction layout, alignment, road signs and signals, provision of pedestrian footways and crossings, barriers (for pedestrians and vehicles), median layout, and access to public transport are reviewed, taking into account risks that may materialize throughout the project life cycle, as well as design features that can enhance project benefits.

GN11.4. A road safety assessment is conducted as part of the environmental and social assessment when the traffic and road safety issues are likely to be significant for the community or road users, for example, in projects that involve new roads, road improvements, traffic management, increasing traffic speed, bus rapid transport, and other forms of urban transport that may change the traffic mix. The assessment considers risks to pedestrians and to important aspects of community cohesion, for example, from bisecting communities or pedestrian routes, creating transport nodes, or affecting access to or traffic on a road. Both construction-related and operational risks are considered. The requirements for vulnerable groups, such as adequate lighting in public areas, suitable ablution facilities near transport, and adequate road crossing structures should all be taken into consideration in the assessment.

GN11.5. As appropriate, details of the road safety measures are set out in the road safety assessment or incorporated in a plan relating to health and safety or traffic management. Such plans set out specific safety measures, for example, measures necessary to manage traffic speeds or provide controls for single-lane two-way traffic to address noise and control dust and drainage issues.

GN11.6. Information on traffic incidents and accidents is used to help manage traffic risks and impacts, and make improvements to safety measures throughout the project life cycle. Monitoring and reporting covers details of fatalities, injuries, crash types, and locations. An emergency response plan may be appropriate to describe the contingencies in place for emergency assistance in the event of incidents and injuries (see paragraph 20 of ESS4). It is recommended to develop the emergency response plan in consultation with the local communities, local emergency responders, and local health authorities.

12. For vehicles or fleets of vehicles for the purposes of the project (owned or leased), the Borrower will put in place appropriate processes, including driver training to improve driver and vehicle safety, as well as systems for monitoring and enforcement. The Borrower will consider the safety record or rating of vehicles in purchase or leasing decisions and require regular maintenance of all project vehicles.

GN12.1. Vehicles or fleets of vehicles for project purposes may include construction vehicles, logging vehicles, cars, trucks, school buses, ambulances, and in certain circumstances, boats and aircraft.

GN12.2. Processes designed to promote driver and vehicle safety would provide for vehicles to be maintained and inspected/tested regularly, and for drivers to have appropriate government licensing or certification and be provided with appropriate training. Other issues to be addressed would include compliance with speed limits, seatbelt use, and helmet use for motorcycle riders. Driver fitness assessments, GPS in vehicles, and control of infractions received may also form part of monitoring programs.

13. 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 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.

Ecosystem Services

14. The project's direct impacts on ecosystem services may result in adverse health and safety risks to and impacts on affected communities.⁴ With respect to this ESS, ecosystem services are limited to provisioning and regulating services as defined in ESS1. Where appropriate and feasible, the Borrower will identify the project's potential risks and impacts on ecosystem services that may be exacerbated by climate change. Adverse impacts will be avoided, and if they are unavoidable, the Borrower will implement appropriate mitigation measures.

Footnote 4. For example, land use changes or the loss of natural buffer areas, such as wetlands, mangroves, and upland forests, which mitigate the effects of natural hazards such as flooding, landslides, and fire, may result in increased vulnerability and community safety-related risks and impacts. The diminution or degradation of natural resources, such as adverse impacts on the quality, quantity, and availability of freshwater, may result in health-related risks and impacts.

GN14.1. As defined in footnote 27 of ESS1, ecosystem services are the benefits that people derive from ecosystems. The provisioning services that ecosystems provide include the products people obtain from the ecosystems, such as food, freshwater, timbers, fibers, and medicinal plants. Regulating services of ecosystems are the benefits people obtain from the regulation of ecosystem processes, such as surface water purification, carbon storage and sequestration, climate regulation, and protection from natural hazards. Ecosystems and ecosystem services affected by the project need to be part of the environmental and social assessment as described in ESS1. Information on ecosystem services may also be found in the Guidance Note for ESS6.

Community Exposure to Health Issues

15. The Borrower will avoid or minimize the potential for community exposure to waterborne, water-based, water-related, and vector-borne diseases, and communicable and non-communicable diseases that could result from project activities, taking into consideration differentiated exposure to and higher sensitivity of vulnerable groups. Where specific diseases⁵ are endemic in communities in the project area, the Borrower is encouraged to explore opportunities during the project life cycle to improve environmental conditions that could help minimize their incidence.

Footnote 5. Such as malaria.

GN15.1. Waterborne diseases are conditions caused by pathogenic microorganisms within a water source. Consuming water contaminated by human, animal, or chemical wastes while bathing, washing, drinking, or by eating food exposed to infected water, is the primary source of such diseases. These diseases are especially prevalent in areas lacking access to adequate sanitation or treatment facilities, and include cholera, diarrhea, dysentery, and typhoid.

GN15.2. Water-based diseases are caused by organisms that have an aquatic development cycle and another cycle as fully grown parasites in other animal or human hosts. These diseases include guinea worm and schistosomiasis.

GN15.3. Vector-borne diseases are caused by pathogens in human populations transmitted by vectors and are often region specific in nature, such as mosquitoes, ticks, and so forth. These diseases include Chagas disease, human African trypanosomiasis, Japanese encephalitis, leishmaniasis, malaria, onchocerciasis, schistosomiasis, and yellow fever.

GN15.4. Communicable diseases are illnesses caused by an infectious agent or its toxins that occur through the direct or indirect transmission of the infectious agent or its products from an infected individual or via an animal, vector, or the inanimate environment to a susceptible animal or human host. Communicable diseases are transmissible from person to person through air, blood, or other bodily fluid and include hepatitis, HIV/AIDS, influenza, polio, syphilis, and tuberculosis.

GN15.5. Noncommunicable diseases are illnesses that are not passed from person to person. They tend to be of long duration and generally slow progression and may include: cardiovascular diseases (for example, heart attacks and stroke); cancers; chronic respiratory diseases (for example, chronic obstructive pulmonary disease and asthma); mental and substance use disorders; digestive diseases; genitourinary diseases; skin diseases; and musculoskeletal diseases and diabetes. Air pollution is also a major contributor to noncommunicable diseases.

GN15.6. The types of projects that may contribute to increased health risks and, therefore, call for particular consideration, include those that create permanent or temporary water bodies that may increase incidences of water-related diseases, such as dams, irrigation schemes, construction pits, or other depressions; projects in areas that lack adequate sanitary wastewater discharge and treatment infrastructure; projects that may result in exposure to air pollution, hazardous materials, chemicals, particulate matter, or radiation, or that contribute to a higher incidence of noncommunicable diseases; projects that exacerbate existing health conditions, affect mental health, or reduce the quality of nutrition; and projects that lead to greater risk of exposure to disease or health issues, for example, as a result of changes to mobility or behavior.

GN15.7. Project-related health risks are assessed as part of the environmental and social assessment or, depending on the nature and significance of the project activities and the potential risks and impacts, through a stand-alone health impact assessment. Where appropriate, measures to avoid, minimize, or mitigate risks and impacts identified during the assessment are integrated into the project's design and implemented throughout the life cycle of the project. In accordance with the requirements of ESS10, community health and safety assessments should be carried out in consultation with local communities, including representatives of local health authorities.

GN15.8. Health risks from project activities may differ within communities, depending on various factors that can contribute to vulnerability, including age, gender, status, physical or mental illness or disability, poverty or economic disadvantage, or dependence on unique natural resources. For example, households that rely on water directly from natural sources may be more at risk of waterborne and water-based diseases than those that receive water from a distribution network. Health risks may also place a disproportionate burden on women, who are often responsible for family health care.

16. The Borrower will take measures to avoid or minimize transmission of communicable diseases that may be associated with the influx of temporary or permanent project labor.

GN16.1. Labor influx is when all or part of a labor force for a project comes from outside the area of the project. In some cases, other people may follow the incoming workforce with the aim of selling them goods and services or in pursuit of job or business opportunities. Further guidance is provided in the World Bank's "Managing the Risks of Adverse Impacts on Communities from Temporary Project Induced Labor Influx," available on the World Bank's website.

GN16.2. The project's environmental and social assessment is the main mechanism for determining the risk of communicable diseases as a result of labor influx, and where appropriate, identifying measures to avoid, minimize, or mitigate the transmission of such diseases. It is important to establish a baseline as part of the environmental and social assessment for monitoring and managing these risks. Risks and impacts may be potentially more significant in certain circumstances, for example, when large numbers of project workers, contractors, and third parties are involved in project activities, or due to the sensitivity of project location or the characteristics of the affected communities.

Management and Safety of Hazardous Materials

17. The Borrower will avoid or minimize the potential for community exposure to hazardous materials and substances that may be released by the project. Where there is a potential for the public (including workers and their families) to be exposed to hazards, particularly those that may be life threatening, the Borrower will exercise special care to avoid or minimize their exposure by modifying, substituting, or eliminating the condition or material causing the potential hazards. Where hazardous materials are part of existing project infrastructure or components, the Borrower will exercise due care during construction and implementation of the project, including decommissioning, to avoid exposure to the community.

18. The Borrower will implement measures and actions to control the safety of deliveries of hazardous materials, and of storage, transportation, and disposal of hazardous materials and wastes, and will implement measures to avoid or control community exposure to such hazardous material.

GN18.1. Hazardous materials and wastes are defined in the EHSs as materials that present a risk to human health, property, and the environment due to their physical or chemical characteristics. These can include: explosives; compressed gases, including toxic or flammable gases; flammable liquids; flammable solids; oxidizing substances; toxic materials; radioactive material; corrosive substances; chemical fertilizers; soil amendments; chemicals, oils, and other hydrocarbons; paints; pesticides; herbicides; fungicides; asbestos; metal waste; hospital and pharmaceutical waste; used batteries; radioactive medical waste; fluorescent light bulbs and ballasts; byproducts of plastic incineration at low temperatures; and polychlorinated biphenyls (PCBs) in electrical equipment. Further details on hazardous materials and wastes may be found in the Guidance Note for ESS3.

GN18.2. The risks to, and impacts on, community health from hazardous materials that may be used during project activities are considered as part of the environmental and social assessment. It is important to note that risks to the community may occur during the transport, storage, and/or disposal of hazardous materials to and from project sites, as well as from exposure during project activities.

GN18.3. Understanding how community members may be exposed to project-related hazardous materials, taking into account the different activities and use of resources by members of the community, in particular those most vulnerable to exposure, helps to identify appropriate mitigation measures. For example, women and children may be particularly susceptible to exposure to contaminants in water when carrying out domestic activities, or children may be affected by contaminated soils, water, or hazardous waste while at play.

GN18.4. Where the risks and impacts of community exposure to hazardous materials and wastes are potentially significant, it may be appropriate to develop a Hazardous Waste Management Plan or a Hazardous Materials Management Plan. The Hazardous Materials Management Plans should set out, at a minimum, the organizational arrangements and responsibilities for hazardous material identification, storage, handling, use, and disposal, including the processes for monitoring and managing the risks and for implementing the necessary mitigation measures throughout the project life cycle.

Emergency Preparedness and Response

19. The Borrower will identify and implement measures to address emergency events. An emergency event is an unanticipated incident, arising from both natural and man-made hazards, typically in the form of fire, explosions, leaks, or spills, which may occur for a variety of different reasons, including failure to implement operating procedures that are designed to prevent their occurrence, extreme weather, or lack of early warning. The measures will be designed to address the emergency event in a coordinated and expeditious manner; to prevent it from injuring the health and safety of the community; and to minimize, mitigate, and compensate for any impacts that may occur.

20. Borrowers engaged in projects having the potential to generate emergency events will conduct a Risk Hazard Assessment (RHA) as part of the environmental and social assessment undertaken pursuant to ESS1. Based on the results of the RHA, the Borrower will prepare an Emergency Response Plan (ERP) in coordination with the relevant local authorities and the affected community, and will take into account the emergency prevention, preparedness, and response arrangements put into place with project workers under ESS2.⁶

Footnote 6. ESS2, paragraph 25.

GN20.1. A RHA is a mechanism to identify potential risks to community health and safety that are caused by man-made or natural emergency events. Where such emergency events could have a significant impact on the communities, for example, fire, explosions, leaks, or spills, this assessment can be conducted either as part of the environmental and social assessment or as a stand-alone activity. The RHA should describe the process for:

- Identifying hazards and other risk factors that may cause harm, and who may be at risk;
- Analyzing and evaluating the hazards and risks;
- Identifying and implementing the controls necessary to eliminate the hazard or control the risks, at all stages of the project life cycle;
- Connecting with relevant national and local authorities, in particular those set forth under the framework of the international health regulations.

When there are risks that hazardous materials or substances may be released by a project, the RHA describes the measures to be put into place to address the emergency and protect those at risk. Borrower capacity to prepare an RHA should be assessed and, if necessary, supplemented with external expertise.

GN20.2. In preparing the RHA, emergency events need to be assessed. The RHA can help determine if such emergency events call for the preparation of an Emergency Response Plan (ERP). In preparing the ERP, it is important that the views of all segments of the local community, including the elderly, children, and any vulnerable groups that may be present, along with those of the emergency services/local response teams and relevant government agencies, be taken into consideration.

21. An ERP will include, as appropriate: (a) engineering controls (such as containment, automatic alarms, and shut-off systems) proportionate to the nature and scale of the hazard; (b) identification of and secure access to emergency equipment available on-site and nearby; (c) notification procedures for designated emergency responders; (d) diverse media channels for notification of the affected community and other stakeholders; (e) a training program for emergency responders including drills at regular intervals; (f) public evacuation procedures; (g) designated coordinator for ERP implementation; and (h) measures for restoration and cleanup of the environment following any major accident.

GN21.1. Specific requirements for ERPs related to dams are described in Annex A of ESS4 on Safety of Dams.

22. The Borrower will document its emergency preparedness and response activities, resources, and responsibilities, and will disclose appropriate information, as well as any subsequent material changes thereto to affected communities, relevant government agencies, or other relevant parties. The Borrower will assist and collaborate with affected communities, relevant government agencies, and other relevant parties in their preparations to respond effectively to an emergency event, especially where their participation and collaboration will be an important part of an effective response.

GN22.1. The effective implementation of an ERP means that all parties work together in a coordinated manner—parties implementing the project and project workers, emergency services, government agencies, and the local community—and understand their respective roles in the event of an emergency. These roles and responsibilities are agreed upon with the relevant agencies and in consultation with concerned parties. It is important to the ERP to allow affected parties to understand exactly what action to take in the event of an emergency. At the same time, it is also important to avoid disclosure of sensitive information regarding security of the project. ESS10 provides more information on disclosure.

23. The Borrower will review the ERP on a regular basis and confirm that it is still capable of addressing the potential range of emergency events that might arise in connection with the project. The Borrower will support affected communities, relevant government agencies, and other relevant parties through training and collaboration, and will conduct such training in conjunction with the training provided to project workers as part of the OHS requirements under ESS2.

GN23.1. Reviewing the ERP for a project on a regular basis helps to ensure that it continues to address the emergency event risks throughout the project life cycle. Where equipment is needed in an emergency response, such as firefighting and training, reviews of the availability and suitability of such equipment are important elements of the ERP.

B. Security Personnel

24. When the Borrower retains direct or contracted workers to provide security to safeguard its personnel and property, it will assess risks posed by these security arrangements to those within and outside the project site. In making such arrangements, the Borrower will be guided by the principles of proportionality and GIIP, and by applicable law in relation to hiring, rules of conduct, training, equipping, and monitoring of such security workers. The Borrower will not sanction any use of force by direct or contracted workers in providing security except when used for preventive and defensive purposes in proportion to the nature and extent of the threat.

GN24.1. Decisions on the appropriate scope of the project's security arrangements are guided by an assessment of (a) potential risks to the project's personnel and property, which may require a security response; (b) appropriate responses to the identified security risks; (c) potential impacts of a security incident on the project, local communities, and other parties; and (d) potential mitigation measures.

GN24.2. It is important to design and implement security arrangements that are proportional to the nature and significance of identified security risks and the project's operating environment, and that take into account both GIIP and national law. For example, for projects in low- to medium-risk contexts, fencing, signposting, lighting, basic security awareness training, and a security guard may be all that are needed to manage security risks. For larger, more complex projects or projects in high-risk contexts, more comprehensive security arrangements may be necessary. For some projects, it may be appropriate to engage external security experts to prepare more comprehensive and detailed risk assessments and management plans.

GN24.3. Periodic assessment of security risks during the life of the project allows security arrangements to be updated to reflect any new risks or changes in the operating environment. It is good practice for security arrangements to be reviewed annually, or when a major event occurs that could affect the security of the project or the project's operating environment.

GN24.4. The security arrangements for a project may themselves pose risks to, and impacts on, project workers and local communities. It is important to take these risks and impacts into consideration and to determine measures to address them, and this should be part of the ongoing stakeholder engagement on the project, as described in ESS10. Project-level grievance mechanisms that are available to project workers, local communities, and other stakeholders allow them to provide feedback on the project's security arrangements and personnel.

GN24.5. Appropriate conduct is expected of any private security forces employed by the project. Contractual arrangements provide clear instructions on the limited circumstances in which force may be used to protect the project's personnel or property. Adequate protocols should also be in place and implemented for security services provided by government entities.

25. The Borrower will seek to ensure that government security personnel deployed to provide security services act in a manner consistent with paragraph 24 above, and encourage the relevant authorities to disclose the security arrangements for the Borrower's facilities to the public, subject to overriding security concerns.

26. The Borrower will (i) make reasonable inquiries to verify that the direct or contracted workers retained by the Borrower to provide security are not implicated in past abuses; (ii) train them adequately (or determine that they are properly trained) in the use of force (and where applicable, firearms) and appropriate conduct toward workers and affected communities; and (iii) require them to act within the applicable law and any requirements set out in the Environmental and Social Commitment (ESCP).

27. The Borrower will review all allegations of unlawful or abusive acts of security personnel, take action (or urge appropriate parties to take action) to prevent recurrence, and where necessary, report unlawful and abusive acts to the relevant authorities.

GN27.1. It is important that the project-level grievance mechanism be able to accept concerns or complaints regarding the conduct of security personnel and that such concerns and complaints, as well as any associated evidence and facts, be promptly documented and assessed and action be taken to prevent recurrence. The responses implemented in response to complaints should be monitored and the outcomes communicated to relevant parties, taking into account the need to protect the confidentiality of victims and complainants.

Annex A: Safety of Dams

A. New Dams

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

Footnote 1. Dams include, for example, a water storage dam for a hydropower, water supply, irrigation, flood control, or multipurpose project; a tailings or a slimes dam; or an ash impoundment dam.

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

- (a) “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; and
- (b) All other dams regardless of size or retention capacity (referred to as “small dams”) 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 paragraph 2 require:

- (a) Reviews by an independent panel of experts (the Panel) of the investigation, design, and construction of the dam and the start of operations;
- (b) Preparation and implementation of the following detailed plans, as further described in Section C:² a plan for construction supervision and quality assurance, an instrumentation plan, an operation and maintenance plan, and an emergency preparedness plan;
- (c) Prequalification of bidders during procurement and bid tendering; and
- (d) Periodic safety inspections of the dam after completion, and implementation of measures required to address safety deficiencies.

Footnote 2. As part of established dam safety practices in certain 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 below.

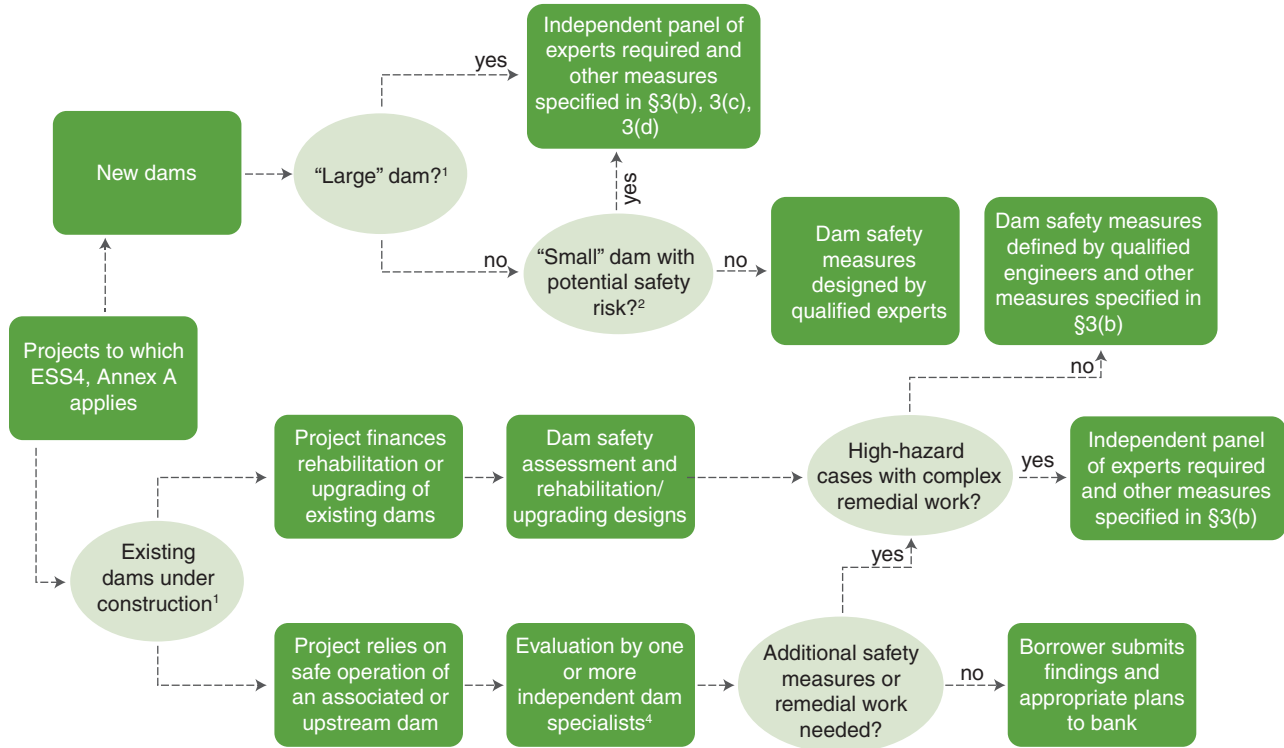
4. The risks associated with a dam are design and situation specific, and will vary depending on structural components, socioeconomic factors, and the environment within which the dam is being constructed and will operate. Application of the requirements set out in paragraph 3 will reflect these considerations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

GNA4.1. In evaluating the risk associated with a dam, situation-specific risks should include the regulatory environment and capacity to assess and manage the full range of associated risks.

5. Where a dam does not fall into the categories set out in paragraph 2, dam safety measures designed by qualified engineers in accordance with GIP will be adopted and implemented.³

Footnote 3. In such circumstances, the Borrower will confirm, through the environmental and social assessment, that there will be no or 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 the proposed project. Such dams could include farm ponds, local silt retention dams, and low embankment tanks.

GNA5.1. The accompanying flow chart describes the circumstances in which this would apply.



¹“Large” dams are defined in §2(a)

²“Small” dams with potential safety risks or that are expected to become large dams as defined in §2(b)

³Includes dams for which rehabilitation works are being directly financed through World Bank projects as well as dams for which their safety and performance are critical to World Bank financed projects

⁴Previously prepared assessment or recommendations may be acceptable as laid out in §10

6. The Panel referred to in paragraph 3 above consists of three or more experts, appointed by the Borrower and acceptable to the Bank, with expertise in the various technical fields relevant to the safety aspects of the particular dam.⁴ The Panel will review and advise the Borrower on matters relative to dam safety and other critical aspects of the dam, its appurtenant structures, the catchment area, the area surrounding the reservoir, and downstream areas. The Borrower 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.

Footnote 4. The number, professional breadth, technical expertise, and experience of Panel members are appropriate 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.

GNA6.1. Relevant expertise for a dam includes geology, hydrology, hydraulics, civil engineering, hydromechanical expertise, hydroelectrical expertise, and materials expertise. It may also include public health expertise, depending on the potential impacts on affected communities. The selection process for panel members with the relevant expertise should ensure that panel members are independent, as required in paragraph 3 of this Annex.

GNA6.2. The selection of panel members is carried out by the Borrower and subject to *no objection* by the Bank. The Borrower convenes the panel either in person or virtually and ensures that its members have access to relevant

documentation, including through the provision of relevant reports or studies (for example, those prepared for the environmental and social assessment). The selection process should ensure that panel members are independent, as required in paragraph 3 of this Annex. Independence from the Project is defined in ESS1.

7. The Borrower 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 will arrange for periodic Panel meetings and reviews, which will continue through the investigation, design, construction, and initial filling and start-up phases of the dam.⁵ The Borrower will inform the Bank in advance of the Panel meetings.⁶ After each meeting, the Panel will provide the Borrower with a written report of its conclusions and recommendations, signed by each participating member; the Borrower will provide a copy of the Panel's report to the Bank. Following the filling of the reservoir and start-up of the dam, the Bank will review the Panel's findings and recommendations. If no significant difficulties are encountered in the filling and start-up of the dam, the Borrower may disband the Panel.

Footnote 5. If the Bank'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.

Footnote 6. The Bank will normally send an observer to these meetings.

GNA7.1. The assessment that there are no significant issues with the filling and the start-up of the dam and the disbandment of the Panel requires a *no objection* from the World Bank.

B. Existing Dams and Dams under Construction (DUC)

8. Where a project relies or may rely on the performance of an existing dam or a dam under construction (DUC) in the Borrower's territory, the Borrower will arrange for one or more independent dam specialists to: (a) inspect and evaluate the safety status of the existing dam or DUC, its appurtenances, and its performance history; (b) review and evaluate the owner's operation and maintenance procedures; and (c) provide a written report of findings and recommendations for any remedial work or safety-related measures necessary to upgrade the existing dam or DUC 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 DUC; diversion dams or hydraulic structures downstream from an existing dam or a DUC, 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 DUC 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 may use a previously prepared dam safety assessment or recommendations for improvements needed in an existing dam or DUC, if: (a) an effective dam safety program is already in operation; and (b) full-level inspections and dam safety assessments of the existing dam or DUC have already been conducted and documented, and are satisfactory to the Bank.

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

12. When the owner of the existing dam or DUC is an entity other than the Borrower, the Borrower will enter into agreements or arrangements providing for the measures set out in paragraphs 8 to 11 of this Annex to be undertaken by the owner.

13. Where appropriate, the Borrower may discuss with the Bank any measures necessary to strengthen the institutional, legislative, and regulatory frameworks for dam safety programs in the country.

GNA13.1. With respect to certification and approval of structural elements of the project, where governmental “approving authority” capacity is limited or inadequate, the roles and responsibilities of alternative approving authorities, such as third-party professionals, should be agreed to and formulated before project implementation.

C. Dam Safety Report

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

- (a) 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,⁷ 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. This plan will be prepared and submitted to the Bank during project preparation.
- (b) 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. This plan will be prepared and submitted to the Panel and Bank before bid tendering.
- (c) 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 the dam; O&M procedures; and arrangements for funding O&M, 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 the project. A preliminary plan will be prepared and provided to the Bank during project preparation. The plan will be refined and completed during project implementation. The final plan will be completed 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 the project.
- (d) Emergency preparedness 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 broad framework plan and an estimate of funds needed to prepare the plan in detail will be prepared and provided to the Bank during project preparation. The plan itself will be prepared during implementation and is provided to the Panel and Bank for review not later than one year before the projected date of initial filling of the reservoir.

Footnote 7. For example, tailings dam or ash impoundment dam.

GNA14.1. The Emergency Preparedness Plan is the same as the ERP referred to in paragraph 20 of ESS4. The Borrower should include expertise capable of planning and developing emergency exercises to effectively test the Emergency Preparedness Plan.

References

There are many resources that may be useful to a Borrower in addressing the application of the ESF. Set out below are references that may assist the Borrower in implementing the requirements of the ESF. The resources listed here do not necessarily represent the views of the World Bank.

Infrastructure and Equipment Design and Safety

American Society of Civil Engineering. “Flood Resistant Design and Construction”. ASCE/SEI 24-14. Reston, Virginia: American Society of Civil Engineering. <http://ascelibrary.org/doi/book/10.1061/9780784413791>

European Integrated Pollution Prevention and Control Bureau. “EU IPPC Bureau Best Available Techniques.” The European IPPC Bureau, Seville, Spain. <http://eippcb.jrc.ec.europa.eu/reference/>

World Bank Group. 2007. “Environmental, Health, and Safety General Guidelines: 3.2 Structural Safety of Project Infrastructure.” Washington, DC: World Bank Group. www.ifc.org/ehsguidelines

———. 2007. “Environmental, Health, and Safety General Guidelines: 3.3 Life and Fire Safety (L&FS).” Washington, DC: World Bank Group. www.ifc.org/ehsguidelines

Henning, Theuns Frederick Phillip. 2017. “Integrating Climate Change into Road Asset Management.” Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/981831493278252684/pdf/114641-WP-ClimateAdaptationandAMSSFinal-PUBLIC.pdf>

International Finance Corporation. 2017. “Good Practice Note: IFC Life and Fire Safety: Hospitals.” International Finance Corporation, Washington, DC. https://www.ifc.org/wps/wcm/connect/0e985447-0aff-4284-bca2-dec3037e59b1/p_GPN_LFS-Hospitals.pdf?MOD=AJPERES

———. 2018. “Good Practice Note: Environmental, Health, and Safety Approaches for Hydropower Projects.” International Finance Corporation, Washington, DC. https://www.ifc.org/wps/wcm/connect/cefc36ec-9916-4ec4-b5ac-1d99602a3ef3/GPN_EHSHydropower.pdf?MOD=AJPERES

Ray, Patrick A., and Casey M. Brown. 2015. “Confronting Climate Uncertainty in Water Resources Planning and Project Design: The Decision Tree Framework.” Washington, DC: World Bank. <https://openknowledge.worldbank.org/bitstream/handle/10986/22544/9781464804779.pdf>

UN Global Geodetic Reference Frame for Sustainable Development. 2015. “Building comprehensive geospatial data to provide a context and overview of dam locations, infrastructure, upstream/downstream relationships that links technical and financial feasibility reports.” See, for example, the World Register of Dams (https://www.icold-cigb.org/GB/world_register/world_register_of_dams.asp) and the Global Reservoir and Dam Database (GRanD) (<http://www.gwsp.org/products/grand-database.html>).

World Bank Group. 2015. “Building Regulation for Resilience: Managing Risks for Safer Cities.” Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/24438>

Climate Considerations for Structural Element Design

World Bank Group. “Climate and Disaster Risk Screening Tools.” Washington, DC: World Bank. <http://climatescreeningtools.worldbank.org/>

———. “Climate Change Knowledge Portal.” Washington, DC: World Bank. <http://sdwebx.worldbank.org/climateportal/>

———. “Climate Risk and Adaptation Country Profiles.” Washington, DC: World Bank. http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country_profile

Health Impact Assessment

World Health Organization. “Health Impact Assessment guidance and tools.” Geneva, Switzerland: World Health Organization. <http://www.who.int/hia/tools/toolkit/en/>

Climate Change Impacts on Vulnerable Communities

World Bank. 2015. “Shock Waves: Managing the Impacts of Climate Change on Poverty”. Washington, DC: World Bank. <http://hdl.handle.net/10986/22787>

Universal Access and Design

Snider, Takeda. 2008. “Design for All: Implications for Bank Operations”. Washington, DC: World Bank. http://siteresources.worldbank.org/DISABILITY/Resources/Universal_Design.pdf

UN Convention on the Rights of Persons with Disability. (Specifically, Article 9 on accessibility.) <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html>

Management Systems for Safety of Services

International Labor Organization. 2001. “Guidelines on occupational safety and health management systems ILO-OSH 2001.” https://www.ilo.org/global/publications/ilo-bookstore/order-online/books/WCMS_PUBL_9221116344_EN/lang-en/index.htm

International Organization for Standardization. 2015. “ISO9001 – Quality Management”. Geneva, Switzerland: International Organization for Standardization. <https://www.iso.org/obp/ui/#iso:std:iso:9001:ed-5:v1:en>

———. 2015. “ISO14001:2015 Environmental Management”. Geneva, Switzerland: International Organization for Standardization. <https://www.iso.org/obp/ui/#iso:std:iso:14001:ed-3:v1:en>

———. 2012. “ISO39001 Road Traffic Safety (RTS) Management Systems”. Geneva, Switzerland: International Organization for Standardization. <https://www.iso.org/obp/ui/#iso:std:iso:39001:ed-1:v1:en>

———. 2018. “ISO45001:2018 Occupational Health and Safety”. Geneva, Switzerland: International Organization for Standardization. <https://www.iso.org/obp/ui/#iso:std:iso:45001:ed-1:v1:en>

World Bank Group. 2007. “Environmental, Health, and Safety General Guidelines: 3.0 Community Health and Safety”. Washington, DC: World Bank Group. <https://www.ifc.org/ehsguidelines>

World Health Organization. 2014. Safe management of wastes from health-care activities (Second edition). Geneva, Switzerland: World Health Organization. http://www.searo.who.int/srilanka/documents/safe_management_of_wastes_from_healthcare_activities.pdf?ua=1

Traffic and Road Safety

Bliss, Tony, and Jeanne Breen. 2013. “Road Safety Management Capacity Reviews and Safe System Projects Guidelines: Updated Version” Washington, DC: World Bank. <http://www.worldbank.org/en/topic/transport/publication/road-safety-management-capacity-review-guidelines>

World Bank Group. 2007. “Environmental, Health, and Safety General Guidelines: 3.4 Traffic Safety”. Washington, DC: World Bank Group. www.ifc.org/ehsguidelines

———. 2007. “Environmental, Health, and Safety General Guidelines: 4.3 Construction and Decommissioning - Community Health and Safety.” Washington, DC: World Bank Group. www.ifc.org/ehsguidelines

———. 2007. “Environmental, Health, and Safety Guidelines: Industry Sector Guidelines for Toll Roads”. Washington, DC: World Bank Group. www.ifc.org/ehsguidelines

Welle, B., A. B. Sharpin, C. Adriazola-Steil, S. Job, S. Shotten, D. Bose, A. Bhatt, S. Alveano, M. Obelheiro, and T. Imamoglu. 2018. “Sustainable and Safe: A Vision and Guidance for Zero Road Deaths”. Washington, DC: World Resources Institute and Global Road Safety Facility. https://wriorg.s3.amazonaws.com/s3fs-public/sustainable-safe.pdf?_ga=2.245306053.1136504343.1552326422-1020317105.1552326422

Road Safety Management Capacity Reviews

African Development Bank. 2014. "Road Safety Manuals for Africa – New Roads and Schemes: Road Safety Audit". African Development Bank, Abidjan, Côte d'Ivoire. https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/ROAD_SAFETY_MANUALS_FOR_AFRICA_-_New_Roads_and_Schemes___Road_Safety_Audit.pdf

Gregersen, N. P., A. Nyberg, and H. Y. Berg. 2003. "Accident involvement among learner drivers—an analysis of the consequences of supervised practice." *Accident Analysis and Prevention* 35 (5): 725–730. <https://www.ncbi.nlm.nih.gov/pubmed/12850073>

Global New Car Assessment Program. <http://www.globalncap.org/>

Ker, K., I. G. Roberts, T. Collier, F. R. Beyer, F. Bunn, and C. Frost. 2003. "Post-license driver education for the prevention of road traffic crashes." *Cochrane Database of Systematic Reviews*, Issue 3. Art. <http://cochranelibrary-wiley.com/doi/10.1002/14651858.CD003734/abstract>

Roberts, I. G., and I. Kwan. 2001. "School-based driver education for the prevention of traffic crashes." *Cochrane Database of Systematic Reviews* 2001, Issue 3. <http://cochranelibrary-wiley.com/doi/10.1002/14651858.CD003201/full>

United Nations Economic Commission for Europe. World Forum for Harmonization of Vehicle Regulations (WP.29). Geneva, Switzerland: United Nations Economic Commission for Europe. <https://www.unece.org/trans/welcome.html>

World Health Organization. 2008. "Speed management: a road safety manual for decision-makers and practitioners." World Health Organization, Geneva. http://whqlibdoc.who.int/publications/2008/9782940395040_eng.pdf?ua=1

———. 2013. "Pedestrian Safety: A road safety manual for decision-makers and practitioners." World Health Organization: Geneva. World Health Organization, Geneva. https://www.who.int/iris/bitstream/10665/79753/1/9789241505352_eng.pdf?ua=1

———. 2017. "Save Lives – A Road Safety Technical Package". World Health Organization, Geneva. <http://apps.who.int/iris/bitstream/10665/255199/1/9789241511704-eng.pdf>

World Road Association. "Road Safety Manual – World Road Association (PIARC)." N.d. Paris, France: World Road Association PIARC. <https://roadsafety.piarc.org/en>

Labor Influx

International Finance Corporation and European Bank for Reconstruction and Development. 2009. "Workers' Accommodation: processes and standards." International Finance Corporation and European Bank for Reconstruction and Development, Washington, DC. https://www.ifc.org/wps/wcm/connect/9839db00488557d1bdfcff6a6515bb18/workers_accomodation.pdf?MOD=AJPERES&CACHEID=9839db00488557d1bdfcff6a6515bb18

World Bank Group. 2007. "Environmental, Health, and Safety General Guidelines: 3.6 Disease Prevention". Washington, DC: World Bank Group. www.ifc.org/ehsguidelines

World Bank. 2009. "Transport Against HIV/AIDS: Synthesis of Experience and Best Practice Guidelines." Transport Paper Series, No. TP-25. World Bank, Washington, DC. <https://www.openknowledge.worldbank.org/handle/10986/17461>

———. 2016. "Managing the Risks of Adverse Impacts on Communities from Temporary Project-Induced Labor Influx." World Bank, Washington, DC. <http://pubdocs.worldbank.org/en/497851495202591233/Managing-Risk-of-Adverse-impact-from-project-labor-influx.pdf>

Security Personnel

International Code of Conduct Association. 2010. "International Code of Conduct for Private Security Service Providers". Geneva, Switzerland: International Code of Conduct Association. https://www.icoca.ch/sites/all/themes/icoca/assets/icoc_english3.pdf

International Finance Corporation. 2017. "Good Practice Handbook on the Use of Security Forces: Assessing and Managing Risks and Impacts." International Finance Corporation and World Bank, Washington, DC. https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_handbook_securityforces

Voluntary Principles on Security and Human Rights. <http://www.voluntaryprinciples.org/>

Emergency Preparedness and Response

European Council and Parliament. 2018. Seveso-III-Directive (2012/18/EU) on the control of major-accident hazards involving dangerous substances. Strasbourg, France: European Council and Parliament. <http://ec.europa.eu/environment/seveso/index.htm>

World Health Organization. 2009. Manual for the public health management of chemical incidents. Geneva, Switzerland: World Health Organization. http://www.who.int/environmental_health_emergencies/publications/FINAL-PHM-Chemical-Incidents_web.pdf

Risk-Based Dam Safety Management

Australian National Committee on Large Dams (ANCOLD). 2003. "Guidelines on Risk Assessment." Australian National Committee on Large Dams, Hobart, Australia. <https://catalogue.nla.gov.au/Record/3672233>

———. 2003. "Guidelines on Dam Safety Management." Australian National Committee on Large Dams, Hobart, Australia. <https://trove.nla.gov.au/work/16379159>

Canadian Dam Association (CAD). 2013. "Dam Safety Guidelines 2007 (2013 Edition)." Canadian Dam Association, Toronto. https://www.cda.ca/EN/Publications/Dam_Safety/EN/Publications_Pages/Dam_Safety_Publications.aspx?hkey=7726b6d1-7ca6-4c8b-a096-c5f93d0ebc40.

International Commission on Large Dams (ICOLD). 2005. "Bulletin 130 - Risk Assessment in Dam Safety Management." International Commission on Large Dams, Paris. <https://www.icold-cigb.org/GB/publications/bulletins.asp>

———. 2017. "Bulletin 154 – Dam Safety Management – Operational Phase of the Dam Life Cycle." International Commission on Large Dams, Paris. <https://www.icold-cigb.org/GB/publications/bulletins.asp>

International Hydropower Association (IHA) -Hydropower Sustainability Assessment Protocol (November 2010). http://www.hydropower.org/sustainable_hydropower/hsaf_Hydropower_Sustainability_Assessment_Protocol.html

New Zealand Society on Large Dams. 2013. "Dam Safety Guidelines." New Zealand Society on Large Dams, Wellington, New Zealand. https://nzsold.org.nz/wp-content/uploads/2017/08/nzsold_dam_safety_guidelines-may-2015.pdf

United Nations Economic Commission for Europe. 2014. "Safety guidelines and good practices for tailings management facilities." United Nations Economic Commission for Europe, Geneva. https://www.unece.org/fileadmin/DAM/env/documents/2014/TEIA/Publications/1326665_ECE_TMF_Publication.pdf

U.S. Army Corps of Engineers – Dam Safety Policy and Procedures: Engineering Regulation (ER) 1110-2-1156. <http://www.usace.army.mil/Missions/CivilWorks/DamSafetyProgram/KeyDocuments.aspx>

U.S. Bureau of Reclamation. 2011. "Interim Rationale Used to Develop Reclamation's Dam Safety Public Protection Guidelines." U.S. Bureau of Reclamation, Washington, DC, August. <http://www.usbr.gov/ssle/damsafety/documents/PPGRationale201108.pdf>

U.S. Federal Emergency Management Agency. 2013. "Federal Guidelines for Dam Safety – Emergency Action Plans for Dams." U.S. Federal Emergency Management Agency, Washington, DC, July. <http://www.fema.gov/media-library/assets/documents/3357>

———. 2015. "Federal Guidelines for Dam Safety Risk Management." U.S. Federal Emergency Management Agency, Washington, DC, February. <https://www.fema.gov/media-library/assets/documents/101958>

U.S. Federal Energy Regulatory Commission. 2016. "Risk-Informed Decision Making – Risk Guidelines for Dam Safety (Interim)." U.S. Federal Energy Regulatory Commission, Washington, DC, March. <http://www.ferc.gov/industries/hydropower/safety/guidelines.asp>