



## PARTICIPANT’S GUIDE

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## GENERAL CHARACTERISTICS OF THE COURSE

### 1. COURSE DESCRIPTION

Welcome to the **Natural Disaster and Climate Change Risk Assessment in Infrastructure Projects** course, offered by the Inter-American Development Bank (IDB) on the edX platform.

This course was designed and organized by the Inter-American Institute for Economic and Social Development (INDES) of the Inter-American Development Bank within the framework of its Operations Learning Program (OLP). Its objective is to strengthen project teams' capacity to preemptively manage events that may affect a project, so as to improve its chance of success.

### 2. PARTICIPANT PROFILE AND PREREQUISITES

The **Natural Disaster and Climate Change Risk Assessment in Infrastructure Projects** course is aimed at:

- Specialists who structure and supervise the execution of infrastructure projects;
- Specialists who carry out specific activities related to natural disaster risk management and/or climate change adaptation;
- Professionals with a technical profile and intermediate experience, from national, subnational, and municipal entities and from public service providers, who make technical contributions to the development and operation of infrastructure projects or projects that include specific climate change adaptation and/or disaster risk management activities;
- Professionals who carry out specific activities related to natural disaster risk management and/or climate change adaptation or who manage the corresponding national public investment systems;
- Professionals interested in natural disaster risk management activities.

### 3. COURSE'S REGISTER MODES

This course is free, and consists of 5 content modules, plus an introduction and closure modules.

Remember that you can take the course under one of the following modalities:

- **Audit track:** Having limited and free access to the course material. With this option you will **not get a verified certification** at the end of the course and you will **not have access to the graded assessment questionnaires**. You will be able to access the free course content (readings, videos, practical case studies, amongst others) for 10 weeks starting from the day you sign up. Once those 10 weeks have gone by, you will no longer have access to the course content.
- **Verified Certificate:** Having full access to all course materials, including graded assessment questionnaires, until the course ends. Once the course ends, you will still have access to the course materials, but you will no longer be able to submit assignments that add to your final grade. If you pass the course, you will get obtain an official certificate issued by the IDB and edX, as well as a [digital badge](#) that you can share on your CV and on LinkedIn.

Throughout the course, you will be informed when your access expires. Take the opportunity to review or download the materials of your interest before that day. Remember to check the customized schedule in this [link](#).

To obtain the verified certificate of the course, you must meet three conditions:

1. Pass the course, obtaining at least 65% of the total points.
2. Pay \$ 25 dollars, which is the minimum cost of issuing certificates that edX establishes.
3. Complete identity verification in edX undergo [identity verification in edX](#).

If you wish to obtain the certificate of the course, you must opt for the verified certificate mode.

Also, if you registered yourself as an audit track without a certificate and decide to obtain it, you can change the modality by making the respective payment. Review the dates and complete the graded assignments required to earn the certificate. EdX has [financial assistance](#) for students who need it. If you opt for this alternative, you can download the [tutorial with the steps to obtain the verified certificate](#).

## 4. DURATION AND COURSE DEDICATION

This course is "self-paced", we estimate that you should dedicate around 2-3 hours per week to complete all the course's activities, including the graded evaluation activities (considering a total of 10 weeks).

Remember that if you opted to take the course in the audit track mode, you will have free access to the course material, including videos, lectures, forums, additional resources, and non-scored practical exercises. However, you will not have access to the scored evaluation questionnaires.

- If you opt for the Audit track, you can complete the course during 10 weeks, starting from the day you subscribed.
- If you opt for the Verified track, you can access the course until the closing date, (Dec 2<sup>nd</sup>, 2021) and will have unlimited access to the course content.

### 4.1 IMPORTANT DATES

The most important dates you should keep in mind are the following

- September 2<sup>nd</sup>, 2021: course becomes available.
- November 18<sup>th</sup>, 2021: deadline to apply for the verified certificate.
- December 2<sup>nd</sup>: end of the available period and the course becomes achieved.

Remember to check the personalized schedule in the first page of the course or in ["dates"](#) tab.

#### Upcoming Dates

📅 Dec 9, 2020

##### Upgrade to Verified Certificate

Don't miss the opportunity to highlight your new knowledge and skills by earning a verified certificate.

[Upgrade to Verified Certificate](#)

📅 Dec 11, 2020

[Actividad de evaluación entre pares: docent](#)

Open Response Assessment due dates are fixed and can't be shifted.

📅 Dec 19, 2020

##### Course End

After this date, course content will be archived.

[View all course dates](#)

In the dates tab you will find a suggested schedule according to the modality you have chosen and the date on which you have registered.



The screenshot shows a navigation menu for the course "IDBx: IDB10x Datos para la efectividad de las políticas públicas". The menu items are: Curso, Progreso, Fechas (highlighted with a red box), Guía del participante, Discusión, FAQs Generales, FAQs Técnicas, Lecturas del curso, Apoyo al participante, and Recursos abiertos. Below the menu, the course title "Datos para la efectividad de las políticas públicas" is displayed.

You can change the due dates by clicking on the button "Shift due dates" to update the calendar.

This process will not affect the progress you have made in the course so far.

#### Important Dates

It looks like you missed some important deadlines based on our suggested schedule. To keep yourself on track, you can update this schedule and shift the past due assignments into the future. Don't worry—you won't lose any of the progress you've made when you shift your due dates.

[Shift due dates](#)

Keep in mind that this button will not be activated when the suggested date has not expired, also it will not be possible to change the expiration date of any open response evaluation and the end of course date is not modifiable.

## 5. IMPORTANT CONSIDERATIONS

To complete the course, you will need:

- A computer with Internet access. We also recommend having updated versions of one of the following browsers: Chrome, Firefox, Safari or Internet Explorer (version 9 onwards).
- You can also access the course through your mobile device or tablet, downloading the edX application from Google Play or Apple Store.

If this is your first edX course, we recommend that you start by viewing the [demo course](#) before you start, to learn how to navigate the platform. If you are already familiar with edX, you can review the first section of the course, "Start here", where you will find all the information you need to successfully complete this MOOC.

This MOOC does not have tutors, but the forums will be moderated by experts from IADB. Also, we will be monitoring and intervening to highlight contributions and take action if the participation criteria in the forums is not complied with.

## 6. LEARNING OBJECTIVES

Strengthen the technical skills of professionals involved in the project cycle for making decisions related to incorporating climate change resilience and disaster risk assessment into the design of infrastructure projects.

To reach this objective, by the end of this course participants will be able to:

- A. Identify the main elements of natural disaster risk.
- B. Recognize the importance of incorporating natural disaster risk assessment (including climate change effects) into the infrastructure project cycle.
- C. Carry out qualitative disaster-risk assessments to guide decision making in infrastructure projects.
- D. Interpret quantitative disaster-risk assessments to guide decision making in infrastructure projects.
- E. Identify when applying qualitative assessments is enough and when quantitative assessments should also be carried out to perform risk assessment in infrastructure projects.
- F. Identify technical and economic feasibility of infrastructure projects through a qualitative or quantitative analysis.
- G. Make risk-informed recommendations for the design, construction, and operation of infrastructures and develop disaster-risk-governance strategies.

To achieve this overall objective, you will have to attain specific objectives in each module, which will help you reach this goal.

## 7. SPECIFIC LEARNING OBJECTIVES AND COURSE STRUCTURE

Course content is structured into five modules with specific objectives that are aligned with the overall objective that you have just read about. Below you will find each module's objectives, their learning resources, the approximate time that you should dedicate to them, and the weight of the activities that carry a score.

### MODULE 0: START HERE

Learning Objectives:

- Become familiar with the edX platform and identify how to access learning resources.
- Identify participation rules and guidance and help resources included in the course.
- Identify each module's assessments and distinguishing the types of questions you will find in the course's questionnaires.
- Identify the overall objective of the course and the tasks you must perform to pass the course.

The purpose of module 0 is to guide you throughout the course.

### MODULE 1: CONCEPTUAL FRAMEWORK OF DISASTER RISK MANAGEMENT

Learning Objectives:

- A. Acknowledge the concept of disaster risk governance and climate change adaptation.
- B. Recognize the importance of incorporating climate change and disaster risk assessment into infrastructure projects.
- C. Define disaster risk.
- D. Classify disaster risks.
- E. Distinguish the main components of risk (hazard, exposure, and vulnerability).
- F. Acknowledge the main methodologies for risk assessment.
- G. Recognize the main phases of disaster risk management.
- H. Distinguish the feasibility, efficiency, and equity concepts of disaster risk assessment.

The following table shows a breakdown of Module 1's learning resources, the approximate time that you should dedicate to them, and the weight of the activities that carry a score.

Subsection	Learning Resource	Time (minutes)	Weight
Challenges for Disaster Risk Reduction in the Region	Module Description and Objectives	10	
	Infographic: The Impact of Natural Disasters in Latin America and the Caribbean	5	
	Video: Challenges for Disaster Risk Reduction	5	

The Value of Risk Assessment in Disaster Risk Management	Reading: The Conceptual Framework of Disaster Risk Management and the Need for Risk Assessment	5	
	Video: Disaster Risk Assessment in Infrastructure Projects	5	
	Reading: A Conceptual Framework of Risk Assessment	20	
	Video: The Methodological Framework of Disaster Risk Assessment	5	
	Drag and Drop: Hazard, Vulnerability, and Exposure Components	10	
How to Operationalize Risk Assessment in Public-Investment Infrastructure Projects	Reading: How to Operationalize Risk Assessment in the Infrastructure Project Life Cycle - The Case of the IDB	30	
	Drag and Drop: Link DRM Steps to Project Cycle Phases	10	
	Assessment Questionnaire	30	16%
Conclusions for Module 1	Main Lessons, Module 1	15	
	Optional: Probability Concepts - Calculation Concepts	0	

## MODULE 2: QUALITATIVE RISK ANALYSIS

### Learning Objectives:

- A. Identify the different elements of a failure mode's structure.
- B. Identify the key aspects of a qualitative disaster risk analysis for infrastructure projects in the preinvestment and design phases (current status and impact of alternatives).
- C. Identify the key aspects of qualitative disaster risk analysis in an infrastructure project in the operation phase.
- D. Identify the main stakeholders involved in the qualitative analysis process.
- E. Assess when applying qualitative analyses is enough and when quantitative analyses should also be carried out to perform risk assessment in infrastructure projects.

The following table shows a breakdown of Module 2's learning resources, the approximate time that you should dedicate to them, and the weight of the activities that carry a score.

Subsection	Learning Resource	Time (minutes)	Weight
Introduction to Qualitative Risk Analysis	Module Description and Objectives	10	
	Reading: Qualitative Risk Analysis	30	
	Video: Qualitative Risk Analysis: Key Concepts	5	
Qualitative Risk Analysis Tools	Reading: Qualitative Risk Analysis Methodologies	30	
	Reading: The Failure Mode Identification Process	30	
	Video: Qualitative Disaster Risk Analysis, Key Concepts	5	
Stakeholders Involved in the Qualitative Risk Analysis	Video: Stakeholders Involved in the Qualitative Risk Analysis	5	
	Drag and Drop: Stakeholders Who Must Be Involved in the Qualitative Risk Analysis	10	
Qualitative and Quantitative Analysis: Applications	Video: Qualitative Analysis: Failure Mode Classification	5	
	Video: Choosing the Type of Analysis to Perform	5	
	Assessment Questionnaire	30	16%
Case Studies	Video: Caribbean Case Study: Coastal Flood Control Infrastructures in the Design Phase	5	



	Reading: Introduction to Caribbean Case Study: Coastal Flood Control Infrastructures in the Design Phase	30	
	Practical Exercise: Qualitative Risk Analysis – Caribbean Case Study or Case study A,B,C.	60	20%
	OPTIONAL Video: Case Study A:	0	
	OPTIONAL: Reading: Introduction Case Study A	0	
	OPTIONAL: Video: Case Study B: Transportation Infrastructure (Roads) in the Design Phase	0	
	OPTIONAL: Reading: Introduction to Case Study B	0	
	OPTIONAL: Video: Case Study C	0	
	OPTIONAL: Qualitative Risk Analysis - Case Study C: Infrastructure for Hydropower Dam in the Operation Phase	0	
Conclusions for Module 2	Main Lessons, Module 2	20	
	OPTIONAL: Caribbean Case Study Solution	0	
	OPTIONAL: Case Study A Solution	0	
	OPTIONAL: Case Study B Solution	0	
	OPTIONAL: Case Study C Solution	0	

## MODULE 3: QUANTITATIVE RISK ANALYSIS

### Learning Objectives:

- A. Define quantitative risk analysis by identifying the main elements of a risk model's structure.
- B. Define the architecture of a risk model.
- C. Recognize the main quantitative inputs—hazards, vulnerability, and consequences—of a risk model.
- D. Identify how to incorporate the impact of climate change into the disaster risk assessment of future scenarios.
- E. Interpret the meaning of F-N and F-D curves at the starting point and in the future.
- F. Identify the main stakeholders involved in the quantitative analysis process.
- G. Distinguish the different existing tolerability recommendations.

The following table shows a breakdown of Module 3's learning resources, the approximate time that you should dedicate to them, and the weight of the activities that carry a score.

Subsection	Learning Resource	Time (minutes)	Weight
Introduction to Quantitative Risk Analysis in Infrastructure Projects	Module Description and Objectives	10	
	Reading: Quantitative Risk Analysis	30	
Risk Models in Infrastructure Projects	Reading: Methodologies for Calculating Risk	30	
	Drag and Drop: Choose Methodologies for Calculating Risk Based on Their Main Characteristics	10	
	Video: Calculating Risk, Part 1	5	
	Video: Calculating Risk, Part 2	5	
	Video: Architecture of a Generic Risk Model	5	
	Drag and Drop: Connect the Event Tree and Other Basic Risk Models	10	
	Video: Data Required for Calculating Risk	5	
	Reading: Risk Model Input Data Requirements	30	
	Drag and Drop: Risk Model Input Data Concepts and Levels of Detail Required Depending on the Scope of the Analysis	10	

Risk Representation and Assessment in Infrastructure Projects	Video: Risk Representation	5	
	Video: Risk Assessment	30	
	Drag and Drop: Choose Representation Tools	10	
	Assessment Questionnaire	30	16%
Comprehensive Risk Management	Reading: Introduction to Risk Assessment for Different Scenarios	30	
	Video: Future Scenario Assessment	5	
	Drag and Drop: Choose Factors Linked to Future Scenario Assessment	10	
	Reading: Uncertainty Analysis	30	
Conclusions for Module 3	Main Lessons, Module 3	20	
	Reading: Caribbean Case Study: Coastal Flood Control Infrastructures in the Design Phase	10	
	OPTIONAL: Reading: Case Study A: Flood Control Infrastructure in the Design Phase	0	
	OPTIONAL: Quantitative Risk Analysis – Case Study B	0	
	OPTIONAL: Quantitative Risk Analysis – Case Study C	0	
Solutions to Case Studies Caribbean, A, B, and C	OPTIONAL: Quantitative Risk Analysis – Caribbean Case Study Solution	10	
	OPTIONAL: Quantitative Risk Analysis - Case Study A Solution	0	
	OPTIONAL: Quantitative Risk Analysis - Case Study B Solution	0	
	OPTIONAL: Quantitative Risk Analysis - Case Study C Solution	0	

## MODULE 4: MAKING DECISIONS INCORPORATING DISASTER-RISK AND ECONOMIC-FEASIBILITY ANALYSES IN INFRASTRUCTURE PROJECTS

### Learning Objectives:

- A. Identify technical and economic feasibility concepts of infrastructure projects, together and separately.
- B. Distinguish the different existing quantitative indicators to prioritize investments and their calculations.
- C. Define sequences of investments based on risk analysis results using quantitative indicators.
- D. Make risk-informed recommendations, combined with other management constraints.

The following table shows a breakdown of Module 4's learning resources, the approximate time that you should dedicate to them, and the weight of the activities that carry a score.

Subsection	Learning Resource	Time (minutes)	Weight
Introduction to the Analysis of Investment Alternatives	Module Description and Objectives	10	
	Reading: Introduction to the Analysis of Investment Alternatives	30	
	Video: Technical and Economic Feasibility Concepts	5	
	Drag and Drop: Identify the Aspects to Consider When Analyzing the Feasibility of Infrastructure Projects	10	
Prioritization of Investments in Risk Reduction	Reading: Principles and Conditioning Factors to Consider when Defining Investment Sequences	30	
	Video: Efficiency and Equity Principles	5	
	Video: Cost-Benefit Analysis with Risk Reduction Criteria	5	
	Reading: Quantitative Indicators for Investment Prioritization	30	
	Drag and Drop: Identify the Type of Indicator Based on Examples	10	
Sequences of Investments for Risk Reduction	Video: Sequences of Investments in Infrastructure Projects	5	
Risk-Informed Decision Making	Video: Risk-Informed Decision Making in Infrastructure Projects	5	
	Discussion Forum - Identify Factors that Influence Decision Making	60	
	Assessment Questionnaire	30	16%

Conclusions for Module 4	Main Lessons, Module 4	15	
	OPTIONAL: Reading: Caribbean Case Study: Coastal Flood Control Infrastructures in the Design Phase	5	
	OPTIONAL: Reading Case Study A		
	OPTIONAL: Reading Case Study C in Full	0	
Solutions to Case Studies	OPTIONAL: Solution Caribbean Case Study	5	
	OPTIONAL: Full Solution to Case Study A	5	
	OPTIONAL: Full Solution to Case Study C	30	

## MODULE 5: DISASTER RISK GOVERNANCE, INCLUDING CLIMATE CHANGE ADAPTATION

### Learning Objectives:

- A. Identify the main components of risk governance.
- B. Recognize the necessary steps toward a risk-informed public investment system.
- C. Incorporate risk assessment into investments in infrastructure projects: The case of the IDB's investment projects.
- D. Identify key aspects and principles for preparing terms of reference to perform quantitative disaster risk analyses for infrastructure projects, based on the examples developed in previous modules, including their alignment with the IDB's policies and capacities, in particular.

The following table shows a breakdown of Module 5's learning resources, the approximate time that you should dedicate to them, and the weight of the activities that carry a score.

Subsection	Learning Resource	Time (minutes)	Weight
Introduction	Module Description and Objectives	10	
	Video: The Conceptual Framework of Disaster Risk Governance	5	
Disaster Risk Governance for Risk-Informed Public Investment Systems	Reading: Disaster Risk Governance Criteria and Parameters in Public Investment	10	
	Drag and Drop: Key Risk Governance Elements	5	
	Reading: National Public Investment System	30	
	Video: Risk Assessment Methodologies: The Case of the IDB	5	
Terms of Reference to Incorporate Disaster Risk Assessment into Infrastructure Projects	Reading: Key Aspects and Principles for Preparing Terms of Reference for Infrastructure Projects	30	
	Word Cloud: Identify the Key Aspects of the IDB's Policy	5	
	Reading: Examples of Terms of Reference	30	
	Assessment Questionnaire	30	16%
End of the Course	Main Lessons, Module 5	15	
	Discussion Forum - Course Closing	60	
	Final Survey	10	



## 8. COURSE METHODOLOGY

As you saw under the Course Structure section above, the first learning resource in each module is a page that contains the module's description and its learning objectives, activities, and assessments. We recommend that you read that page carefully to find out about the activities you will have to perform to successfully complete the course.

In the design of this course, we have combined passive learning resources, such as videos and readings, and active learning resources, such as practical activities, in which your participation and commitment are the cornerstones of learning.

It is important to keep in mind that learning results from making a conscious effort to research, analyze, reflect on, and share topics of interest. We therefore urge you to get the most out of the course by actively participating in it.

### 8.1 LEARNING RESOURCES

Each module (or section) is divided into subsections, within which you will find several types of components or learning resources.

- **Presenter Videos:** The course's main learning resource. Videos are short and feature the participation of global experts in each subject.
- **Readings:** Texts that contain the conceptual content of the course and are organized by topic.
- **Practical Activities:** Three practical exercises, which are tasks that must be performed throughout the course and whose objective is to implement disaster risk assessment. All practical activities will be assessed by the tutor, and they will count toward your final score for the course. For more information, please go to the [Assessment Criteria](#) section.
- **Knowledge Assessment Questionnaires:** Tests that are used to measure how much you have learned in each module. For more information, please go to the [Assessment Criteria](#) section.
- **Drag and Drop Activities:** Summative assessment activities, i.e., they do not influence your final grade for the course but help you better understand course content.

### 8.2 ASSESSMENT CRITERIA

Throughout the MOOC you will find 3 types of activities:

- **Graded quizzes:** Five quizzes, one for each module that include multiple-choice questions, drag-and-drop, or true/false. The aim is to anchor the knowledge and determine whether the learning objectives are being met. Each one is worth 15%, and together they make up 90% of the course's final grade. You will have two chances to take each quiz, and they will only be accessible to participants who opt for the verified certificate modality.
- **Case studies:** 4 Case studies whose objective is to test your knowledge.
- **Nongraded exercises:** All participants, regardless of the modality selected, will have access to ungraded exercises, (multiple-choice questions and drag-and-drop exercises) to confirm your



understanding of the most important concepts in each module. These exercises do not count toward passing the course.

To pass the course, you will have to answer all the qualified evaluation questionnaires and obtain an average equal to or greater than 65% among all the qualified activities.

To verify your course progress (percentage of course approval), go to the [“Progress”](#) that you will find in the top menu of the platform.

## 9. COURSE INSTRUCTORS

If you wish learn more about the course instructors, visit the tab [“Meet your instructors and the course team”](#).

## 10. PARTICIPANT SUPPORT SERVICES

The following services will be available for the duration of the course.

### 10.1 EDX HELP CENTER

At the [edX Help Center](#) you will find answers to frequently asked questions about getting started with your course, basic edX information, certificate information, and other related topics.

### 10.2 PARTICIPANT SUPPORT

On the platform you will find two tabs with frequently asked questions.

- Frequently Asked General Questions ([General FAQ](#)). Here you will find answers to general topics in the course, such as deadlines or questions about the format of assessment questionnaires. If you do not find an answer to your question, you can send your tutor an email. Response time is up to 24 hours from Monday to Friday and up to 48 hours during the weekend.
- Frequently Asked Technical Questions ([Technical FAQ](#)). If you do not find an answer to your question, at the end of the page there is a form through which you can request personalized technical attention.

## 11. COURSE POLICIES

### 11.1 IDBX ACCESSIBILITY POLICY

Since we use the edX platform for course delivery, we adopt edX's [accessibility policy](#).

### 11.2 ACADEMIC INTEGRITY POLICY

Since we use the edX platform for course delivery, we address academic integrity issues through [edX's honor code](#).

### 11.3 PRIVACY POLICY

Since we use the edX platform for course delivery, we address privacy issues through [edX's privacy policy](#).