About ThinkHazard!

ThinkHazard! is a new online tool that allows those who are not specialists on taking into account the impacts from disasters in new development projects. ThinkHazard! Users can quickly and reliably evaluate the level of danger of a river flood, earthquake, draught, cyclone, coastal flooding, tsunami, eruption and landslide in the area of the project.

ThinkHazard! is an easy-to-use warning that highlights existent products in the area of the project. Users only have to introduce the location of their project (country name, province o district), and see if it needs a high, medium or low level of attention for different dangers during the planning stage of their project.

ThinkHazard!also provides recommendations and orientation on ways to reduce the risk from different dangers in the area of the project, and offers links to additional resources, such as risk assessments of a country, better practices and others websites. ThinkHazard! also, emphasizes in the possible future evolution of the different dangers as a consequence of climate change.

ThinkHazard! the methodology is documented here.

Developed by:

GFDRR
Global Facility for Disaster Reduction and Recovery

In association with:

Geoscience for a sustainable Earth
brgm

camp
tocamp
INNOVATIVE SOLUTIONS
BY OPEN SOURCE EXPERTS

Deltares
Enabling Delta Life

WORLD BANK GROUP

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The following organizations have contributed data or information from experts for the development of this tool:

Universiteit Utrecht

Australian Government
Geoscience Australia

The tool has an open code to motivate other users to adapt it to their own needs. The code is available at Github.

The current request version is

Administrative limits source: set of Global Administrative Unit Layers (GAUL) applied by the FAO in the CountrySTAT system and in the Information System projects on the Agricultural Markets (ISAM).

The data was last published on Tue Jun 30 15:57:03 2020.

Disclaimer

The levels of danger and orientation provided in ThinkHazard! Do not replace the need to carry out a detailed analysis of the risk of natural dangers or to request specialized assessment. As much as ThinkHazard! does everything possible to scientifically determine the levels of danger, there still are imprecisions in the data and analysis. In order to get additional information, users of the tool should contact corresponding national authorities, review the recommended resources and access detailed data on dangers.

This analysis tool provides information only aimed to be informative and does not constitute a means or a legal or scientific counseling service. The World Bank does not formulate statements, expressively or implicitly, or does it give any type of warranty regarding the accuracy or integrity of this tool or the data contained in it. Users of this tool shall recur to qualified experts in order to get specific diagnostics and analysis of a project in particular. All use of the tool will be of exclusive discretion and responsibility of the users. The conclusion or inferences extracted from the tool or related to some aspect of the maps shown in it shall not be attributable to the World Bank, its Executive Board, its management or its member countries.

The ThinkHazard! Management team periodically adds, changes, improves or updates the materials in this site without prior notice. This site also contains links to third party websites. The sites connected are not under control of the World Bank, and it is not responsible of the content of such websites or of any link included in those webpages. Those links are provided solely as a complementary resource, and the inclusion of a link does not imply that the World Bank approves of the website in question.

The borders, colors, denominations and other information included in any of the maps of the tool do not imply judgement or support at all on behalf of the World Bank nor any data provider about the dangers regarding the outlining or legal situation of any territory or borders. Under no circumstance will the World Bank be responsible for any damage derived from the application or incorrect application of the tool, the maps or the related materials.

The administrative limits have been obtained from the set of Global Administrative Unit Layers (GAUL) data, applied by the FAO in the CountrySTAT system and in the projects of the Information System on Agricultural Markets (ISMA), with some modifications in the names of the administrative units.

Ecuador

Forest Fire

Hazard level: **High**

In the area that has been chosen (Ecuador), the danger of a forest fire is classified as **high** according to the information available in this tool. This mean that there is more than 50% probability that there are favorable meteorological conditions for an important forest fire to occur that could cause loss of lives and properties in a given year. Based on this information, the impact of forest fire **shall be taken into account** in all stages of the project, in particular during the designing and construction stages. **The decisions related to planning of the project, designing of the project, building methods y emergency response planning shall consider the level of danger of forest fire**. Take into account that damage may happen not only due to direct exposure to flames and radiation, but also to the ember and the low-level surface fire. In extreme meteorological phenomena, such as fires, strong winds and remains transported by the air may put the infrastructure in danger. It would be prudent to take into account the effect in the design and construction phases of the project. More information detailed regarding the location and the planned project would have be obtained in order to appropriately understand the level of danger.

Impacts from climate change: the modelled projections of future climate identify a probable increase in the frequency of favorable meteorological conditions to fires of this region, such as the rise in temperature and a greater variability of rains. In the areas already affected by the danger of forest fires, it is probable that the length of forest fires season increases, and that this last one includes a greater number of days with favorable atmospheric conditions for the spread of fires due to longer periods without rain during forest fire seasons. The climatic projections indicate that there may also be an increase in the severity of the fires. It would be prudent to design projects in the area that are resistant to the increases of the severity and frequency of the danger of forest fires. The areas with a very low or low-level danger of forest fires may undergo an increase in danger, given that the climatic projection indicate an expansion of the area where forest fires may happen. Evaluate the execution of local assessment on climate change impacts on forest fire tendencies before deciding if projects that are resistant to fires of greater intensity to the ones that happened previously in this region should be designed.

Additional resources

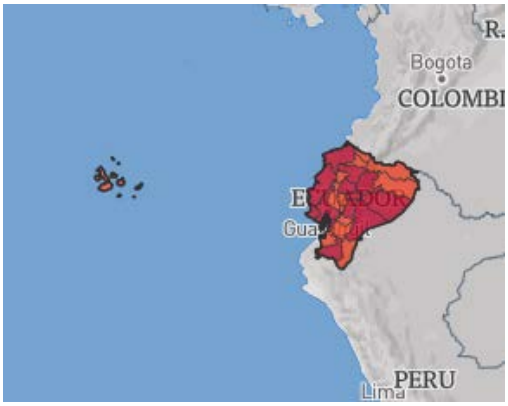
- ☐Climate risk management in Ecuador
- ☐Country Adaptation Profile: Ecuador
- ☐Building Urban Resilience - Principles, Tools, and Practice
- ☐Shock Waves : Managing the Impacts of Climate Change on Poverty
- ☐Turn Down the Heat : Why a 4 Degree Centrigrade Warmer World Must be Avoided

Ecuador

Earthquake

Hazard level: **High**

In the area that has been chosen (Ecuador), the danger of an earthquake is classified as **high** according to the information currently available. This means that there is more than a 20% probability that in the next 50 years there will be a potentially harmful earthquake in the area of your project. Based on this information, the impact from an earthquake **shall be taken into account** in all phases of the project, particularly during the design and construction. **The decisions relative to the planning of the project, the design of the project and the construction methods shall consider the level of seismic danger**. More detailed information to appropriately evaluate the level of danger would have to ben obtained.



Additional resources

- ☐Ecuador Instituto Geofísico - Earthquakes
- ☐Ecuador Risk Spatial Data Portal - Secretaría de Gestión de Riesgos
- ☐Global Earthquake Model - SARA project
- ☐E-learning course: Understanding Risk (World Bank)
- ☐Hospital Safety Index Guide
- ☐Building Urban Resilience - Principles, Tools, and Practice
- ☐Defining disaster resilience: a DFID approach paper
- ☐EMDAT: Country Profile on Historical Disaster Events
- ☐Global Assessment Report on Disaster Risk Reduction: Country Profiles
- ☐Global Earthquake Model - GEM Foundation
- ☐Global Risk Patterns and Trends in Global Assessment Report
- ☐Guidance on Safe School Construction
- ☐INFORM: Index for Risk Management
- ☐Reducing Earthquake Risk in Hospitals
- ☐Temblor
- ☐Towards Safer School Construction
- ☐Understanding Risk in an Evolving World - Emerging Best Practices in Natural Disaster Risk Assessment
- ☐Comprehensive Safe Hospital Framework

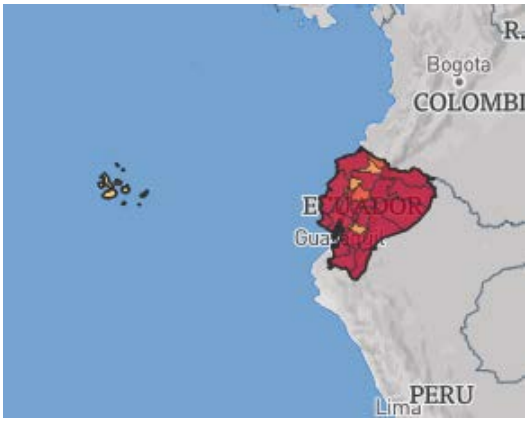
Ecuador

Urban flood

Hazard level: **High**

In the area that has been chosen (Ecuador), the danger of an urban flooding is classified as high according to the information available in this tool. This means that it is expected that in the next 10 years potentially harmful and mortal urban floods will occur at least once. **The decisions relative to the planning of the project, the design of the project and the construction methods shall consider the level of danger of urban flooding**. Next, a list of recommendations that can be followed in the different phases of the project in order to help lower the risk of your project. Keep in mind that these recommendations are general and not specific for your project.

Climate change impacts: there is a medium level that daily precipitations and the number of days with intense precipitations increase. The current level of danger could remain similar in the long-term when only climate change is considered. However, the changes in the environment and the use of land also influence the evolution of the danger of a localized river flooding and alter the level of future danger.



Additional resources

- ☐Climate risk management in Ecuador
- ☐Climate risk management in Ecuador
- ☐Country Adaptation Profile: Ecuador
- ☐Ecuador Risk Spatial Data Portal - Secretaría de Gestión de Riesgos
- ☐Turn Down the Heat : Confronting the New Climate Normal
- ☐FLOPROS: A global database of Flood Protection Standards
- ☐Shock Waves : Managing the Impacts of Climate Change on Poverty
- ☐Turn Down the Heat : Why a 4 Degree Centrigrade Warmer World Must be Avoided
- ☐Building Urban Resilience - Principles, Tools, and Practice

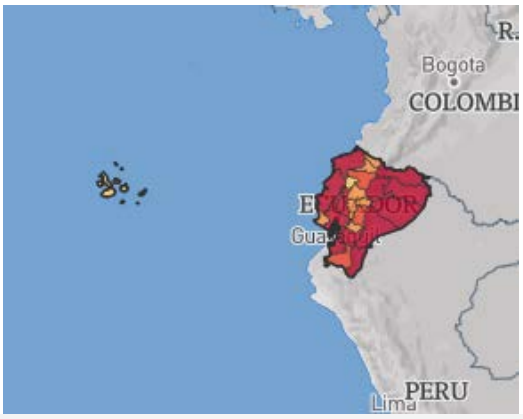
Ecuador

River floods

Hazard level: **High**

In the area that has been chosen (Ecuador), the danger of a river flooding is classified as **high** according to the information of modelled floods available in this tool. This means that it is expected to have potentially damaging and mortal river floods at least once. **The decisions relative to the planning of the project, the design of the project and the construction methods shall consider the level of danger of river floods**. In this classification of the danger of surface flooding in urban and rural areas is not included, which could also be possible in this place. Look at "urban flooding" to consider the urban Surface and river flooding. Next, a list of recommendations that can be followed in the different phases of the project in order to help to lower the risk of your project. Keep in mind that these recommendations are general and not specific for a particular project.

Climate change impacts: there is a medium level that daily precipitations and the number of days with intense precipitations increase. The level of current danger could remain similar in the long-term when only climate change is considered. However, the changes in the environment and the use of land also influence the evolution of the danger of a localized river flooding and alter the level of future danger.



Additional resources

- ☐Climate risk management in Ecuador
- ☐Climate risk management in Ecuador
- ☐Country Adaptation Profile: Ecuador
- ☐Ecuador Risk Spatial Data Portal - Secretaría de Gestión de Riesgos
- ☐Turn Down the Heat : Confronting the New Climate Normal
- ☐Building Urban Resilience - Principles, Tools, and Practice
- ☐Cities and Flooding: A Guide to Integrated Urban Flood Risk Management for the 21st Century
- ☐Climate Change Knowledge Portal
- ☐Defining disaster resilience: a DFID approach paper
- ☐EMDAT: Country Profile on Historical Disaster Events
- ☐FLOPROS: A global database of Flood Protection Standards
- ☐Global Assessment Report on Disaster Risk Reduction: Country Profiles
- ☐Global Risk Patterns and Trends in Global Assessment Report
- ☐Guidance on Safe School Construction
- ☐INFORM: Index for Risk Management
- ☐Shock Waves : Managing the Impacts of Climate Change on Poverty
- ☐Towards Safer School Construction
- ☐Turn Down the Heat : Why a 4 Degree Centrigrade Warmer World Must be Avoided

- ☐Understanding Risk in an Evolving World - Emerging Best Practices in Natural Disaster Risk Assessment
- ☐Understanding the Economics of Flood Risk Reduction
- ☐Weather and Climate Resilience: E11ective Preparedness through National Meteorological and Hydrological Services
- ☐Weather and Climate Resilience: E11ective Preparedness through National Meteorological and Hydrological Services
- ☐Cities and Flooding: A Guide to Integrated Urban Flood Risk Management for the 21st Century

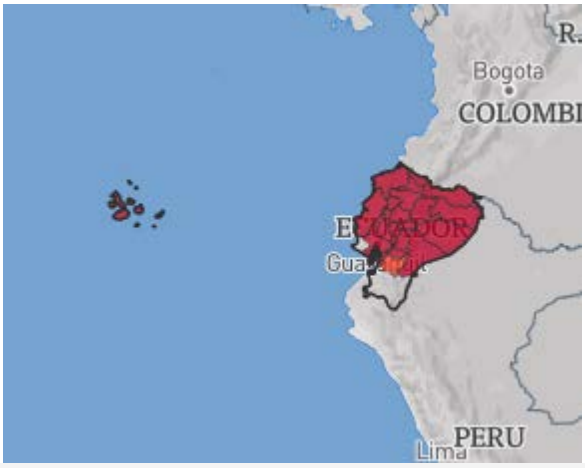
Ecuador

Vulcanic eruption

Hazard level: **High**

In the area that has been chosen (Ecuador), the danger of a volcanic eruption s classified as **low** according the information currently available. This means that the area chosen is at least 50kms away from a volcano which has been registered to have had a potentially damaging eruption in the last 2000 years and it is possible there will be damaging eruptions in the future. Based on this information, **the impact from a volcanic eruption shall be taken into consideration in all phases of the project, particularly during the design, implementation and maintenance phases of the project**. More detailed information is needed in order to properly evaluate the risk level that volcanoes represent.

Climate change impact: the future loss of the mass of the ice caps over the volcanoes currently located under glaciers could result in eruptions (IPCC, 2013).



Additional resources

- ☐Ecuador Instituto Geofísico - Volcanoes
- ☐Ecuador Risk Spatial Data Portal - Secretaría de Gestión de Riesgos
- ☐Infrastructure impacts, management and adaptations to eruptions at Volcán Tungurahua, Ecuador, 1999-2010
- ☐Propuesta metodologica para el estudio de vulnerabilitdades ante amenazas sismicas, volcanicas y climaticas para municipakidades medianas y pequenas del Ecuador
- ☐Propuesta metodologica para el estudio de vulnerabilitdades ante amenazas sismicas, volcanicas y climaticas para municipakidades medianas y pequenas del Ecuador
- ☐Database of Volcanoes - Global Volansim Program
- ☐Defining disaster resilience: a DFID approach paper
- ☐EMDAT: Country Profile on Historical Disaster Events
- ☐Earthquake-report.com - Independent Earthquake Reporting Site
- ☐Global Assessment Report on Disaster Risk Reduction: Country Profiles
- ☐Guidance on Safe School Construction
- ☐Guidelines on preparedness before, during and a12er an ashfall
- ☐Living with volcanoes - The sustainable livelihoods approach for volcano-related opportunities
- ☐The health hazards of volcanic ash - A guide for the public
- ☐Towards Safer School Construction
- ☐Understanding Risk in an Evolving World - Emerging Best Practices in Natural Disaster Risk Assessment
- ☐Volcanic Ash impacts on critical infrastructure
- ☐Volcanic Ash: What it can do and how to prevent damage
- ☐Volcanic ash fall hazard and risk
- ☐Volcanic gases and aerosols guidelines
- ☐Volcanic hazards and their mitigation - Progress and problems
- ☐Volcano Observatory database - World Organization of Volcano Observatories (WOVO)

Ecuador

Tsunami

Hazard level: **High**

In the area that has been selected (Ecuador), the danger of a tsunami is classified as **high** according to the information currently available. This means that there is more than a 20% probability that a potentially harmful tsunami occurs in the next 50 years. Based on this information, the impact from a tsunami shall be taken into account in the different phases of the project for all its activities located near the coast. **The decisions relative to the planning of the project, the design of the project and the construction methods shall consider the level of danger of a tsunami**. More detailed information is needed in order to properly evaluate the risk level.

Climate change impact: the areas at risk of a tsunami will increase as the average global sea level rises. According to the IPCC (2013), the rise of the average global sea level depends on different factors, and the estimations for 2100 vary between around 20cms and 1 m. However, the regional changes in sea level are difficult to predict. Projects in low coastal areas, such as deltas, or in island States should be designed in such a way that they are resistant to the predicted global sea levels.

Additional resources

- ☐Defining disaster resilience: a DFID approach paper
- ☐EMDAT: Country Profile on Historical Disaster Events
- ☐Global Assessment Report on Disaster Risk Reduction: Country Profiles
- ☐Guidance on Safe School Construction
- ☐INFORM: Index for Risk Management
- ☐Learning from Megadisasters: Lessons from the Great Japan Earthquake
- ☐Learning from Megadisasters: Lessons from the Great Japan Earthquake
- ☐Preparing your community for tsunamis
- ☐Towards Safer School Construction
- ☐Tsunami Runup Database
- ☐Understanding Risk in an Evolving World - Emerging Best Practices in Natural Disaster Risk Assessment

Ecuador

Coastal flood

Hazard level: **High**

In the area that has been selected (Ecuador), the danger of a coastal flood is classified as **high** according to the information currently available. This means that it is expected that in the next 10 years there will be potentially harmful waves that will flood the coast at least once. Based on this information, the impact of a coastal flood **should** be taken into consideration in the different phases of the project for all activities located near the coast. **The decisions relative to the planning of the project, the design of the project and the construction methods shall consider the level of danger of a coastal flood.** More detailed information is needed in order to properly evaluate the level of danger.

Additional resources

- ☐Climate risk management in Ecuador
- ☐Climate risk management in Ecuador
- ☐Country Adaptation Profile: Ecuador
- ☐Ecuador Risk Spatial Data Portal - Secretaría de Gestión de Riesgos
- ☐Turn Down the Heat : Confronting the New Climate Normal
- ☐Climate Change Knowledge Portal
- ☐EMDAT: Country Profile on Historical Disaster Events
- ☐FLOPROS: A global database of Flood Protection Standards
- ☐Global Assessment Report on Disaster Risk Reduction: Country Profiles
- ☐INFORM: Index for Risk Management
- ☐Shock Waves : Managing the Impacts of Climate Change on Poverty
- ☐Turn Down the Heat : Why a 4 Degree Centrigrade Warmer World Must be Avoided
- ☐Understanding Risk in an Evolving World - Emerging Best Practices in Natural Disaster Risk Assessment
- ☐Building Urban Resilience - Principles, Tools, and Practice

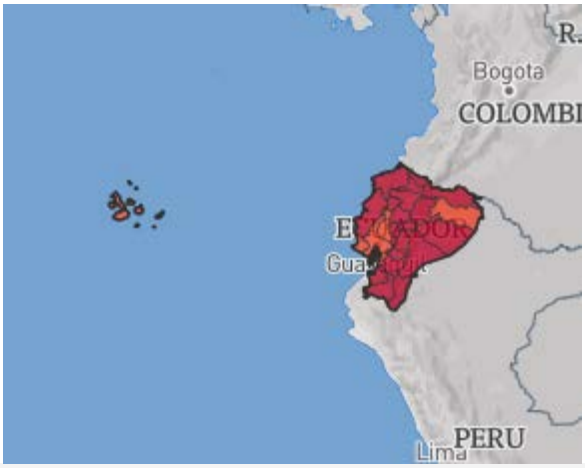
Ecuador

Landslides

Hazard level: **High**

In the area that has been selected (Ecuador), the predisposition of landslides is classified as high according to the information currently available. This means that this area shows rain patterns, land inclination, geology, soil, soil cover, and (possibly) earthquakes that cause localized landslides to become frequent. Based on this information, the decisions relative to the planning, such as the location of the project, the design of the project and the construction methods, shall take into consideration the possibility of landslides. More detailed information is needed in order to better understand the degree of vulnerability of landslides in the area of the project.

Climate change impact: it is probable that climate change will alter the stability of slopes and bedrocks given the changes in precipitations or temperature. It is difficult to determine when and where great rock avalanches will happen since these depend on the local geological conditions and other non-climate related factors.



Additional resources

- Climate risk management in Ecuador
- Climate risk management in Ecuador
- Country Adaptation Profile: Ecuador

- Ecuador Risk Spatial Data Portal - Secretaría de Gestión de Riesgos
- Turn Down the Heat : Confronting the New Climate Normal
- Climate Change Knowledge Portal
- Community Based Landslide Risk Reduction
- Defining disaster resilience: a DFID approach paper
- EMDAT: Country Profile on Historical Disaster Events
- Global Assessment Report on Disaster Risk Reduction: Country Profiles
- Global Risk Patterns and Trends in Global Assessment Report
- Guidance on Safe School Construction
- Towards Safer School Construction
- Turn Down the Heat : Why a 4 Degree Centrigrade Warmer World Must be Avoided
- Understanding Risk in an Evolving World - Emerging Best Practices in Natural Disaster Risk Assessment
- Building Urban Resilience - Principles, Tools, and Practice

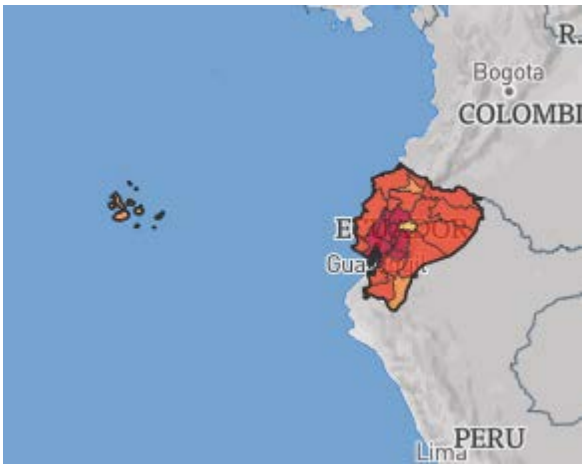
Ecuador

Extreme heat

Hazard level: **High**

In the area that has been selected (Ecuador), the danger of extreme danger is classified as **high** according to the information available in this tool. This means that it is expected to at least have a prolonged exposure to extreme heat once in the next five years, causing a result of thermal stress. **The decisions relative to the planning of the project, the design of the project and the construction methods shall consider the level of extreme danger.** Next, a list of recommendations that can be followed in the different phases of the project in order to help to lower the risk of your project. Keep in mind that these recommendations are general and not specific for a particular project.

According to the latest assessment report from the Intergovernmental Panel on Climate Change (IPCC, 2013), the continuous emissions of greenhouse gases cause additional warming, and surely extreme warm temperature level will be registered more frequently in most areas in the planet in the next 50 years. Global warming will not be even in the regions. In the area that you have chosen, the rise in temperature will slightly be below global average, but it will still be considerable in the next 50 years. It would be prudent to design projects in this area that are resistant to global warming in the long term.



Additional resources

- ☐Climate risk management in Ecuador
- ☐Climate risk management in Ecuador
- ☐Country Adaptation Profile: Ecuador
- ☐Turn Down the Heat : Confronting the New Climate Normal
- ☐Excessive Heat Events Guidebook
- ☐Heatwaves and Health: Guidance on Warning-System Development
- ☐Shock Waves : Managing the Impacts of Climate Change on Poverty
- ☐Turn Down the Heat : Why a 4 Degree Centrigrade Warmer World Must be Avoided
- ☐Building Urban Resilience - Principles, Tools, and Practice

Ecuador

Water scarcity

Hazard level: **Very low**

In the area that has been selected (Ecuador), water scarcity is classified as **very low or inexistent** according to the information available in this tool. However, other data could show a certain level of danger. If other sources of information, whether they be local or from a different nature, indicate there is a danger of draught, follow the recommendations and look for advice from experts to find out recommended complementary measures. In the area that has been selected, there will be a draught episode at least once every 1000 years. Based on this information, **it is not necessary to explicitly take into account the danger of a draught for your project.** Even though the danger of a draught is considered as very low or inexistent in the place of the project, other data could show a certain level of danger. If local information sources or other types indicate that there is a danger of a draught, do the following recommendations and look for advice from experts to find out complementary recommended measures.

Climate change impact: the projections of the models are consistent in their estimations of the change in the danger of a draught, which influences water scarcity. The current level of danger could increase in the future due to the effects of climate change. It would be prudent to design projects in this area that are resistant to a major danger of draught and water scarcity in the long term.

Additional resources

- Climate risk management in Ecuador
- Climate risk management in Ecuador
- Country Adaptation Profile: Ecuador
- Turn Down the Heat : Confronting the New Climate Normal
- Climate Change Knowledge Portal
- Defining disaster resilience: a DFID approach paper
- Drought Risk Reduction: Framework and Practices
- EMDAT: Country Profile on Historical Disaster Events
- Global Assessment Report on Disaster Risk Reduction: Country Profiles
- Guidance on Safe School Construction
- INFORM: Index for Risk Management
- National Drought Management Policy Guidelines: A Template for Action
- Shock Waves : Managing the Impacts of Climate Change on Poverty
- Towards Safer School Construction
- Turn Down the Heat : Why a 4 Degree Centrigrade Warmer World Must be Avoided
- Understanding Risk in an Evolving World - Emerging Best Practices in Natural Disaster Risk Assessment
- Building Urban Resilience - Principles, Tools, and Practice

Ecuador

Cyclone

Hazard level: **Very low**

In the area that has been selected (Ecuador), the cyclone danger (also known as hurricane or typhoon) is classified as **very low** according to the information currently available. This means that there is less than a 1% probability that in the next 10 years potentially harmful wind speeds will be registered in the area of your project. Based on this information, it is **not necessary** to take into account the impact from cyclones in different phases of the project, particularly during the design and construction stages. Even though the danger is considered very low or inexistent in the place of the project according to the information available in ThinkHazard!, other data could show a certain level of danger of a cyclone. If local information sources or other types of sources indicate that there is danger of a cyclone, do the following recommendations and look for advice from experts to find out complementary recommended measures.

Additional resources

- Climate risk management in Ecuador
- Climate risk management in Ecuador
- Country Adaptation Profile: Ecuador
- Turn Down the Heat : Confronting the New Climate Normal
- Climate Change Knowledge Portal
- Defining disaster resilience: a DFID approach paper
- EMDAT: Country Profile on Historical Disaster Events
- Global Assessment Report on Disaster Risk Reduction: Country Profiles
- Guidance on Safe School Construction
- INFORM: Index for Risk Management
- Past Tropical Cyclones
- Shock Waves : Managing the Impacts of Climate Change on Poverty
- Towards Safer School Construction
- Turn Down the Heat : Why a 4 Degree Centrigrade Warmer World Must be Avoided
- Understanding Risk in an Evolving World - Emerging Best Practices in Natural Disaster Risk Assessment
- Building Urban Resilience - Principles, Tools, and Practice