## **Contextual analysis of geophysical susceptibility to hazards**

## Risk-Informed Development Guide: Tool 3

Use this tool to check if the communities concerned are living in contexts or conditions that are susceptible to various hazards. This template is particularly useful for stage three of risk-informed development planning.

**Overview**

Certain conditions and contexts can cause specific hazards. Look for these conditions to determine if the community concerned is prone to the hazards corresponding to these conditions.

Two table are provided:

* Table 1 shows hazards that are either natural or triggered by climate change
* Table 2 shows hazards that are human triggered

The list of hazards is illustrative and not exhaustive. The geographic determinants of susceptibility to hazards could be mapped or located with reference the settlement. Local indicators of susceptibility to hazards may be related to people, place, physical factors, and systems.

# Table 1: Hazards that are either natural or triggered by climate change

| **Hazard** | **Geographic determinants of susceptibility to hazards** | **Local indicators of susceptibility to hazards** |
| --- | --- | --- |
| Earthquakes and tremors | Presence of fault lines in the locality and in the region around the community, village or town  Are there dams, mining explosion activities in areas with a history of earthquakes and seismic activities?  Presence of volcanic craters | Soil instability (frequent erosions, lands that are barren)  Buildings and constructions that are not seismic appropriate or resistant  No or poor early warning systems |
| Landslides | Mountainous landscapes and valley regions | Barren lands, fallow agricultural landscapes, soils with high water holding capacity and shallow soils |
| Flooding (river flooding) | Communities living in proximity to large river and river systems, especially in five year, 10-year floodplains  Communities living in proximity to rivers with increasing trends of rainfall (rainfall duration and intensity) in its basin | Valley regions and drainage areas of the river |
| Flooding (urban flooding) | Older historic areas within the city (as these typically become low lying areas as the city expands around it and also because these areas have older and degraded drainage systems)  Areas which have organically developed (i.e. unplanned) within the city  Peri-urban areas (areas that are lying towards the edges of the city administrative areas) | Areas in close proximity to canals and storm water drains or rivers and rivulets  Areas with older drainage and sewerage systems and areas which don’t have drainage systems in place  Areas in proximity to polluted landscapes and drains that are clogged with solid waste |
| Volcanic eruptions | Landscapes with previous history of volcanic eruptions and volcanic activities (refer to historic data from data library) | Areas lying in proximity to active and dormant fissures.  Valley areas in volcanic landscapes |
| Cyclones and tsunamis | Coastal regions and island regions | Coastal belts that do not have mangroves or coral reefs  Coastal belts that have narrow deltas  No or poor early warning systems or forecast models |
| Wildfires | Regions with deciduous forests | Deciduous landscapes with high lightning activities and thunderstorms |
| Heat Waves | Increased frequency of extreme daily maximum temperatures | Areas with urban heat island effects  Areas with sparse tree canopy or tree cover |
| Drought | Deserts, regions with low rainfall and high evapotranspiration | Barren landscapes.  Areas with seasonal water bodies. |
| Cloudburst | Mountainous landscapes and valley regions below | Areas lying in close proximity to rivers |
| Glacier outburst | Mountainous landscapes and valley regions below | Observed trend of higher daily temperatures in high altitudes  Blasting and mining activities in close proximity to glaciers |
| Insects swarming farmlands | Global and especially linked to climatic changes in regions | Large swarms of insects migrating across regions (farmlands and agricultural lands are most at risk and susceptible) |

# Table 2: Hazards that are human triggered

| **Hazard** | **Local indicators of susceptibility to hazards** |
| --- | --- |
| Health crisis related to an infectious disease | * Poor health and starving population * Absence of robust primary health centres and network of higher-order medical facilities |
| Fire and explosions | * Unregulated and unsafe chemical industries, fire-cracker making industries * Unregulated, unsafe or poorly maintained gas pipelines or electricity grids |
| Industrial hazards (air poisoning/pollution) | * Proximity of hazardous industries or nuclear power plants to human settlements |
| Industrial hazards (water poisoning/pollution) | * Proximity of hazardous industries or unscientific landfill sites to water bodies or regions with high water table |
| Industrial hazards (soil/land pollution) | * Agricultural belts with heavy fertiliser or pesticide usage * Unscientific landfill sites and waste dumping grounds |
| Dam break | * Blasting and mining activities near dams * Dams located near fault lines and in earthquake prone regions * High erosion rates in the catchment region of the dam |