



Landslide



Landslide-
displacement of rock masses
along
the slope under the influence of their
ownweight and additional load due
to the erosion of the slope,
waterlogging of rocks, seismic shocks
and other processes.

Causes of landslides



Natural:

- the steepness of the slope that exceeds the angle of the natural slope;
- waterlogging of slopes, washing away;
- weathering of hard rocks;
- crossing of rocks by cracks;
- alternation of clay and sand-gravel rocks;
- the presence of clays, sands, and ice in the soil thickness;
- earthquakes



Anthropogenic (human):

- deforestation of forests, shrubs on the slopes;
- cutting of roads, construction of trenches and canals;
- construction of various objects on the slopes;
- blasting operations;
- plowing of slopes;
- excessive watering of gardens on the slopes;
- filling up of underground water outlet sites;
- waterlogging of the slopes due to malfunctions in the water and sewer network.

Signs of a landslide:

- doors and windows in the house stop closing or are clamped;
- cracks appear in the house on the plaster walls and the foundation;
- cracks appear and expand on the ground surface, sidewalks, roads;
- under the base of the slopes, the earth swells, new outlets of underground water appear, fences and trees begin to shift;
- a rumble is heard and increases.



If the object
(residential building, country house)
is located in a mountainous area,
you must:

- know the signs of landslide danger;
- get expert recommendations for the construction or expansion of the site;
- regularly conduct a visual inspection of the territories for the detection of cracks, shifts, waterlogging of the soil, technical malfunction of pipeline lines, sewerage, water wedging.

REMEMBER!

If the slope is steeper than 15 degrees,
the construction of buildings without special measures to
protect them from mudflows, landslides and landslides i
s not allowed. (SNIP RK 2.03. - 30-2006)



When detecting signs of a landslide

inform the relevant authorities and departments of the Ministry of Emergency Situations about the situation. Take all precautions, including evacuation from the danger zone. In case of untimely adoption of preventive measures, landslides can lead to loss of life.

Tasks and actions of those living in the territories at risk:

- turn off electricity, water supply, gas supply;
- remove highly flammable and toxic substances from the house. Escape from a dangerous place to a safe place;
- restrict people's access to the risk zone.

Flood



Flood - an intense, relatively short-term rise in the water level. It is formed by heavy rains, sometimes by melting snow during winter thaws.

High water is a periodic rise in the water level in rivers, usually caused by spring snowmelt or heavy rains on lowland rivers, as well as spring-summer melting of snow and glaciers on rivers originating in mountainous areas.

Floods are dangerous hydrological phenomena. Floods to a greater or lesser extent are periodically observed on most of the rivers of Kazakhstan and occupy one of the first places in a number of natural disasters in terms of the area of distribution and the material damage caused.

In terms of the number of human casualties and material damage, **floods rank second after earthquakes.**



Safety measure:



1. Constantly follow the media reports about the situation in the mountains.
2. Leave the mountains if there is heavy heavy rain in the upper reaches of the river basin.
Do not stop for rest and do not set up a tent camp near riverbeds, on lake bridges and under them.
3. Do not stop near steep cliffs and steep slopes, as the shaking during the passage of the flood can cause a landslide or rockfall.
4. If there are signs of flooding, immediately move as far away from the riverbed as possible up the mountain slopes.

If the public is notified of an approaching flood, as well as at the first signs of its manifestation, it is necessary to leave the premises as soon as possible, warn others about the danger and go to a safe place. In order not to cause a short circuit, leaving the house, you need to extinguish the stoves, turn off the gas taps, turn off the lights and turn off electrical appliances.

The population living and working in the vicinity of the riverbeds of flood-prone rivers should do not ignore messages sent by **112**. In case of a threat, on the received signal (notification), immediately evacuate along pre-planned routes to the places of shelter, taking with you the necessary documents and valuables.

Everyone needs to develop their own specific activities,) in which you should reflect:

- information about the phone numbers and addresses of emergency medical services, fire and emergency services, the cooperative of apartment owners(KSK), the emergency department on duty, the district emergency department;
- names, addresses, phone numbers of the closest friends of relatives who can help both inside and outside the disaster zone plan for coordination and interaction in the family and with neighbors, including, each family member (especially children) is obliged to know where he should go if he can not return home.

WARNING!



In the event of a devastating flood, making sure that there will not be a second flood, start search operations, extraction of victims, first aid, and road clearing. Meet all the requirements of the emergency services.





WATCH OUT FOR THE FRAZIL ICE DRIFT!

On the rivers of mountain ranges Ile, Zhetysu, Kungei Alatau, Almaty region in winter, almost every year there are frazil ice drift, causing significant damage. Such flows are possible from one to 3-5 times per winter.

FRAZIL- ice that floats to the surface or is carried deep into the stream. The frazil can be in a state of movement on the surface and inside the water flow - ice flood (frazil ice drift), or in a stationary state - subglacial sludge. Significant accumulations of frazil in rivers under the ice can form gaps, which leads to a rise in the water level, sometimes the formation of congestion.

FRAZIL ICE DRIFT- the movement of a water flow floating to the surface and carried by the current of intra-water ice (frazil), which is a loose mass consisting of plate-shaped crystals. Frazil ice drift is formed before the ice age, as well as in winter on non-freezing, rapid sections of rivers. The flow of the frazil involves ice jams, fences, bottom ice, sand, and individual stones. Flow rates can reach up to 200 m³/s and in some cases even more.





The characteristics of the ice-water flood (frazil ice drift) are determined by the weather conditions, the hydraulic properties of the flow and the morphological features of the channel. They are formed mainly with the onset of thaws after severe frosts and liquid precipitation.

Anthropogenic factors play an important role in the formation and passage of s frazil ice drift. Even hydraulic structures for various purposes can aggravate the processes of formation of frazil flows. The presence of stabilization structures designed to reduce the risk of mudslides in the summer, in winter, often become an activating condition for their occurrence. To reduce the risk of occurrence or characteristics during the passage of ice-water floods (frazil ice drift), preventive measures are carried out, mainly consisting in clearing the channel from ice formations. Timely and competent implementation of them can completely prevent the passage of ice-water floods (frazil ice drift). Insufficient well-thought-out organization of clearing works can aggravate the situation.

The most typical is the passage of the passage of frazil ice drift in the second half of the day, namely in the evening and even at night.

Safety measure:



1. Constantly monitor the state of the riverbed, ice phenomena.
2. Do not allow children to play or be near riverbeds.
3. Do not organize a crowd of people.
4. Be careful when crossing the riverbed in a dangerous period, pay attention to the riverbed upstream. Cross the river quickly.
5. Do not stop near the riverbed.
6. If there are signs of flooding (rising water levels, increasing turbidity, increasing the number of floating pieces of ice) , immediately move as far away from the riverbed as possible.
7. The population living and working in the vicinity of the riverbeds of flood-prone rivers should do not ignore SMS messages sent by **112** service.

WARNING!

Observe all safety precautions while in the immediate vicinity of the riverbed.

Avalanche



An avalanche is a rapid, sudden movement of snow and ice down steep mountain slopes, posing a threat to human life and health, causing damage to economic facilities and the natural environment.

Avalanches very often threaten settlements, sports and health resort complexes, railways and highways, power lines, and other objects and structures located in the risk zone.





Avalanche-forming factors include:

- snow cover height;
- snow density;
- snowfall intensity;
- snow cover subsidence;
- changes in the temperature regime of the air and snow cover;
- blizzard redistribution of snow cover.

In the absence of precipitation, avalanches can be the result of intense snow melting under the influence of heat, solar radiation, and recrystallization processes that lead to the destruction of the snow column and the weakening of the strength and load-bearing capacity of individual layers.

The formation of avalanches occurs in an avalanche hearth, which is a section of the slope and its foot, within which the avalanche moves.



The avalanche-prone period in the republic usually lasts from December to April.

However, in some years, the first avalanches descend in November, and the last in May. In the glacial zone, avalanche danger persists all year round.

Avalanches are most often caused by intense snowfall, as well as deep thaws and spring snowmelt, human or animal exposure

As protective measures in these areas, the forecast of avalanche danger is used.

To protect against avalanches, restrictions on the access of the population and vehicles during the avalanche-prone period are applied.

In case of avalanche danger, it is not recommended to stay in the risk zone, and in some cases, access restrictions or a complete ban are imposed by setting up roadblocks.

If necessary, preventive descents of snow avalanches are carried out with the help of explosions.

To ensure avalanche safety, it is planned to build protective engineering structures (avalanche nets, shields, galleries, walls, etc.)

WARNING!



1. Do not ignore messages sent by **112** service information about warnings from the competent authorities.
2. Constantly follow the media reports about the situation in the mountains.
3. Do not stop to rest on avalanche-prone areas.
4. Use maximum caution when driving on avalanche-prone areas.



IT IS STRICTLY PROHIBITED

When performing explosive work on the collapse of snow avalanches, finding people at the base of an avalanche-prone slope or entering the boundaries of the separation zones.

MUDFLOW



A MUDFLOW IS A FORMIDABLE NATURAL PHENOMENON WITH A HUGE DESTRUCTIVE FORCE, WHICH IS WIDESPREAD IN MOUNTAINOUS AREAS.

Signs of mudflow hazard:

- the occurrence of prolonged or intense heavy rains;
- a sharp and prolonged increase in air temperature in the upper reaches of mudflow-prone rivers, causing the overflow of moraine lakes and creating the danger of their breakthrough;
- a sharp drop or increase in the water level in the river, an increase in the turbidity of the water.



Safety measures:



1. Constantly follow the media reports about the situation in the mountains.
2. Leave the mudflow channel if there is heavy heavy rain in the upper reaches of the mudflow basin. Do not stop for rest and do not set up a tent camp near mudslide-prone riverbeds, on lake bridges and under them.
3. Do not approach the moving mudflow closer than 50-70 meters.
4. Do not stop near steep cliffs and steep slopes, as a landslide or rockfall may occur due to shaking during the passage of the mudslide.
5. Move along mudslides at intervals of at least 20-30 meters between people.
6. If there are signs of a mudflow, immediately move as far away from the riverbed as possible up the mountain slopes.
7. Do not go down into the mudflow channel after passing the midflow shaf.

If the public is notified of an approaching mudflow, as well as at the first signs of its manifestation, it is necessary to leave the room as soon as possible, warn others about the danger and go to a safe place. To avoid a fire, leaving the house, you need to extinguish the stoves, turn off the gas taps, turn off the lights and turn off electrical appliances.

The population living and working in the vicinity of mudflow-prone riverbeds should do not ignore SMS messages sent by **112** service. If there is a threat of mudslides, immediately evacuate on the received signal (notification) along pre-planned routes to the places of shelter, taking with you the necessary documents and valuables. The route of movement and collection points should be specified in the district emergency departments and their KSK at the place of residence.

Rules of behavior in case of a threat or occurrence of a mudflow



If the house is located in a dangerous area, make a list of documents, property and medicines to be taken out during the evacuation in advance. Put in a special backpack (suitcase) valuables, necessary warm clothes, a supply of food, water and medicines. In case of a threat or a sudden village, taking warm clothes with you, you can climb to the highest points of the terrain. In case of early evacuation, turn off the electricity, gas and water supply before leaving the house. Close the doors, windows, and air vents tightly. After a mudslide, you should beware of repeated mudslides, sliding slopes, torn and sagging electrical wires, damaged gas mains.

Everyone needs to develop their own specific activities,) in which you should reflect:

- information about the phone numbers and addresses of emergency medical services, fire and emergency services, the cooperative of apartment owners (KSK), the district emergency department;
- names, addresses, phone numbers of the closest friends of relatives who can help both inside and outside the disaster zone plan for coordination and interaction in the family and with neighbors, including, each family member (especially children) is obliged to know where he should go if he can not return home.



IN EMERGENCY SITUATIONS
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Department of Emergency Situations Almaty region
Taldykorgan 8(7282) 22-15-91, 22-38-52