RESERVES
MANAGEMENT
CENTER

State Tourism Agency
of the Republic of Azerbaijan

Şəki üçün
Fövqəladə halların idarə olunması planı

Sheki city
Emergency Management Plan

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Dövlət Turizm Agentliyinin Qoruqları İdarəetmə Mərkəzinin sifarişi ilə hazırlanıb.

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Sheki city
Emergency Management Plan

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Introduction

Sheki is in the southern foothills of the Greater Caucasus Mountains. The city has a population of 63,000. The city is very famous for its historic buildings and these buildings are examples of historical heritage and have been declared a UNESCO's World Heritage Site as the "Historical Center of Sheki together with the Khan's Palace". Sheki Khan's Palace, caravanserais, mosques and minarets, ancient bridges, handicraft workshops and residential houses have a special historical significance. The protection of these historical monuments from natural and man-made disasters is a very important issue and requires a lot of disaster reduction and preparedness activities.

The available data confirms that a broad range of hazards of both natural and human origin occur in the city. Recent vulnerability assessment confirmed that the city of Sheki and its historical buildings are very vulnerable to these hazards. Key hazards observed in the territory of Sheki are flash floods, debris flows, heavy rains, hails, earthquakes, landslides, and forest fires. Due to ongoing climate changes, frequency and magnitude of these hazards will likely rise. Over the last decades, the scale of damage resulting from these hazards has significantly expanded which in its turn demonstrates a low level of preparedness of the city.

This document is a framework document that the city will mobilize its resources against all possible threats and take the necessary steps to reduce disaster risks and make the whole city and its historical part prepared and protected.

The presented risk assessment methodology allows the city's level of preparedness / vulnerability to natural and man-made hazards to be assessed on a regular basis and to determine what action can be taken in the required areas to reduce disaster risks.

In addition, the Emergency Plan confirms a coordinated response to the emergencies, the mobilization of existing staff and resources in the city, and the involvement of additional resources if needed. At the same time, other events that could damage the historical part are also in the spotlight.

The Emergency Plan is applied as an instrument to support emergency and local services and officials in their emergency response activities to provide an efficient and effective response to an emergency.

The plan outlines what local government offices, city offices, residents, schools, and other service providers in Sheki will do during emergencies, what they should do, and how to mobilize resources to reduce losses. At the same time, the plan shows how to reduce disaster risk during non-emergency periods and mitigate all possible hazards.

In short, the objectives of the emergency plan are as follows:

- To mobilize state and community resources regularly to reduce disaster risks in the city and its historical part
- To improve preparedness for human and natural hazards in non-emergency situations
- To determine the roles and responsibilities of state and community organizations
- To provide participation of local communities during the emergency and non-emergency periods
- To reduce human and material losses caused by disasters in the city
- To strengthen coordination between stakeholders to improve emergency preparedness
- To organize effective resource management during emergencies
- To mobilize resources to eliminate complications after emergencies
- To mainstream DRR (Disaster Risk Reduction) activities into the future development plans of Sheki city

Legislation concerning the structural and non-structural safety in Azerbaijan

Legal ground is one of the most important features for disaster risk reduction, management, and mainstreaming.
Azerbaijani legal ground on emergencies and disaster risk reduction includes:

- Law on State of Emergency
- Town Planning and Building Code
- Law on Fire Safety
- Law on Civil Defense
- Law on Education

Law on State of Emergency

Town planning and Building Code of the Republic of Azerbaijan were adopted in 2004. In accordance with the Constitution of the Republic of Azerbaijan, a temporary state of emergency may be imposed in the Republic of Azerbaijan or in some parts of it for the protection of the

country and the security of its citizens. The state of emergency determines additional responsibilities and a special regime of operations for state authorities and administration bodies, enterprises, departments and organizations, community and civil society organizations and citizens. The purpose of the state of emergency is to normalize the situation as soon as possible, to restore the rights and freedoms of citizens, to eliminate the consequences of natural disasters, environmental and other disasters. According to Article 2 of this law, a state of emergency is declared during natural disasters, epidemics, epizootics, major environmental and other accidents.

Town Planning and Building Code

Town planning and Building Code of the Republic of Azerbaijan were adopted in 2012. It is the main legal document on the safety and regulations of construction throughout Azerbaijan, including the city of Sheki. This document is the legal ground that stipulates principles of all town planning and building activities in Azerbaijani Republic. This is the only document that provides legal ground for the structural safety of buildings, including school buildings. The document also provides a legal ground for the roles of government, municipalities, and companies concerning land use and building activities.

Article 4 and 5 shows the main directions of the government policy and authority in the field of urban planning and building. Article 6 deals with the authority of municipalities. Article 9 stipulates principles of fire and environmental safety of constructions and buildings. According to Article 60, all the material used in buildings must be fire-resistant and reliable to prevent fires from spreading out. Walls, doors, ceilings (Article 61) and floors should be constructed from fire-resistant materials and provide easy fire compartmentalization. In addition, the article suggests that fire compartments should be built and is easily accessible during the fires. According to Article 62, stairs should be easily accessible and usable during emergency evacuations. Article 54 requires that materials used in constructions must be certified according to relevant requirements. All the construction materials that are used during the construction have to be approved by State Fire Control Service since it is the main executive body that controls fire resiliency of materials and buildings.

Law on Fire Safety

Law on Fire Safety provides legal ground for non-structural and structural fire safety of all types of buildings, including historical buildings, private houses, schools etc. The current law on fire

safety was adopted in 1997. The law determines legal ground and principles of state fire protection and control. The law is enforced for the provision of fire protection on the territory of the Azerbaijan Republic of human life and health, national treasures, all types of property.
Article 9 of the law on Fire Safety specifies that State Fire Service is a main governmental body that guarantees fire safety of all types of buildings. Article 5 stipulates functions of relevant authorities with respect to fire safety. According to this article, related executive bodies have the following functions:

- ✓ Provide the implementation of fire safety measures at buildings, schools, enterprises and managed areas
- ✓ Establish and support fire service teams in workplaces and schools
- ✓ Organize the implementation of fire safety propaganda and educate population in fire safety
- ✓ Provide strict compliance with norms, standards and rules of fire safety by the management of government authorities, enterprises and organizations as well as citizens
- ✓ Organize the development and provide the execution of the fire safety measures
- ✓ Organize training of the population in fire safety measures and increase public awareness.

Article 16 is about implementation of firefighting propaganda and training of population in fire safety measures. The article suggests that mandatory training on fire safety for children in pre-school age facilities and public schools is provided in accordance with specialized educational programs by relevant state executive body.

The Law on Civil Defense

The law on civil defense was adopted in 1997. The Law of Azerbaijan Republic on Civil Defense stipulates the legal grounds and principles of civil defense in Azerbaijan Republic and regulates public relations in the field of civil defense. According to Article 5, the aim of civil defense is the development of preventive measures to prevent emergencies, minimizing the possible damage and losses due to emergencies and mitigation of emergencies and their consequences.
Article 6 defines the responsibilities of the state, companies, communities and individuals in the field of civil defense. According to this this article, all interested parties in the field of civil defense in emergencies are responsible for minimizing the effects of the state of emergency.

Article 11 stipulates that the Ministry of Emergency Situations of Azerbaijan Republic carries out awareness-raising in the field of protection of the population.

Current ES related institutional framework, roles, and responsibilities

The institutional situation in Sheki district is characterized by independently operating ministries and entities that form a group of DRR related stakeholders with coordination. Government, private sector, government, local communities, civil society are the main stakeholders Sheki that are related to DRR activities.
Currently, the following organizations are involved in Disaster Risk Reduction and Emergency Management in Sheki.

State Tourism Agency

The State Tourism Agency is the central executive body implementing state policy and regulation in the field of tourism and protection of historical and cultural monuments. The Agency shall formulate and implement a unified state policy in the field of tourism to organize the decisive use and preservation of historical heritage sites.
In Sheki, the agency is engaged in the protection and use of historical heritage. The Agency carries out the following activities to protect historical heritage sites from dangerous natural and man-made events:

- Increasing the resilience of heritage buildings against fires, earthquakes, floods, mudslides, fires, and other hazards in Sheki
- Ensuring structural and non-structural safety of historic buildings
- Improving the preparedness of staff for hazards in historic buildings
- Directing the behavior of staff and tourists in the building during hazards
- Restoration of historical heritage after disasters

North-West Regional Center of the Ministry of Emergency Situations

Ministry of Emergency Situation is the main legal agency in Azerbaijan that support DRR and disaster risk management. North-West Regional Center of the Ministry of Emergency Situations is located in the Gabala district and operates in Sheki district as well. The Centre has a fire service in Sheki city and perform permanent activities in DRR and other emergency fields.

The Ministry of Emergency Situations is responsible for the following areas:

- Civil defense
- Protection of population during natural and human-made disasters
- Prevention of emergencies and elimination of their consequences
- Fire security
- Safety of people in water basins

- Security of smaller vessels' operations
- Technical safety in industry and mountain-mine works
- Safety in construction
- Protection of strategic facilities, objects and installations in cases of imminence/occurrence of an emergency situation

The Ministry fo Emergency Situations has following emergency services that operate for Sheki city:

- State Fire Protection Service (Fire risk reduction and management)
- Fire Control Service (Assistance and Control over Fire safety)
- Civil Defense Troops (Rescue and evacuation in emergency situations)
- State Agency for Control over Construction Safety (Control over structural safety of public buildings during constructions, control over building standards)

Sheki District Fire Protection Department

The State Fire Protection Service is an executive body that extinguishes fires in the country and carries out urgent rescue operations (people, property, etc.), determines the requirements for firefighting equipment and facilities, as well as the establishment of voluntary and out-of-department fire protection units.
Firefighting services operating in Sheki and surrounding areas organize firefighting operations by various means. The activities of the service include firefighting in case of fire, regular assessment of fire risks, implementation of risk reduction measures in areas with high fire risk, regular education of residents, school staff and various departments. The local fire service can be easily reached by calling 101 and 112. The local fire department also assesses the risk of fire in heritage buildings, schools, catering services and other public buildings and inspects evacuation plans and the work of emergency teams organized at these facilities.

Sheki Emergency and Urgent Medical Aid Service and Sheki Central Hospital

Sheki has very comprehensive Emergency and Urgent Medical Aid Service. Together Sheki Central Hospital it is responsible to implement health policy and govern most medical services in Sheki city. The emergency medical service is responsible to carry out emergency health service during all types of disasters.

This service arrives in Sheki by phone 103 or any other call line in case of emergency of any origin and provides first aid to those in need, as well as delivers them to Sheki Central Hospital or first aid station.

The Crisis Management Center

The Crisis Management Center is a governing body under the Ministry of Emergency Situations established for the operational management of forces and means to prevent and eliminate the consequences of emergencies. The Center also collects, summarizes, analyzes information from various sources, and makes relevant decisions.

The Crisis Management Center operates in crisis situations. As a rule, the center receives a call about any emergency via 112 and takes action accordingly.

In other cases, the information may be received from the relevant government agencies. In this case, rescue teams arrive at the scene with their equipment and begin to reduce the negative side of the emergency.

Sheki Executive Power and Sheki District Comission on Emergency Situations

Sheki Executive Power is a local government body that governs territory of the districts. Every district executive power has designated local authority, which oversees representing districts during emergency situations. This local authority is a deputy head of the district executive power.

State Commission on Emergency Situations is a derivative body of the Council of Ministries of Azerbaijani republic. This institution was established in 1992 before establishment of the Ministry of Emergency Situations. The local commission in Sheki is a part of the district executive power. The deputy Prime Minister is a chairman of the commission. The aim of the commission is to coordinate activities of ministries and local government bodies during emergency situations.
Sheki District Emergency Situations Commission is a permanent commission operating within the Sheki District Executive Power. As a rule, this commission was established to organize effective coordination between the relevant agencies to eliminate the consequences of emergencies. The Commission has the following responsibilities:

- ✓ Reduction of damage caused by emergencies
- ✓ Ensuring resilience to emergencies
- ✓ Prevention of emergencies
- ✓ Regular disaster risk assessment

- ✓ Disaster risk reduction as a result of appropriate measures
- ✓ Increasing the resilience of the population to disaster risk reduction

The members of the Emergency Situations Commission are as follows but not limited to:

- ✓ Sheki District Executive Power (First Deputy Chief Executive Officer is the chairman of the commission)
- ✓ Sheki District State Fire Protection Department
- ✓ Sheki District Hygiene and Epidemiology Center
- ✓ Sheki District Education Department
- ✓ Sheki Central Hospital
- ✓ Architecture and construction department of Sheki Executive Power
- ✓ Sheki Regional Culture Department
- ✓ Sheki Forest Protection and Restoration Enterprise

Sheki Municipality and Local Communities

Sheki Municipality is responsible to carry out land use management and development practices in all municipality lands. The Municipality is also in charge of initiating public control over the use of natural resources. Sheki Municipality is an organization operating on a elected basis in the area. The Municipality is in very close contact with the local population and ensures the participation of the local population in solving a broad range of problems.

Currently, the number of municipal members is 17 and there are 5 permanent commissions in the Municipality:

- Standing Committee on Budget
- Standing Committee on Economic Development
- Standing Committee on Legal Affairs
- Standing Committee on Local Social Affairs
- Standing Committee on Environmental Affairs

The Municipality is a very convenient organization in terms of involving residents and schools to various kinds of activities during the emergencies. The Municipality has a big potential in establishing community groups.

The role of local communities in the fight against floods and fires in Sheki is very important. Data collected from the local population confirms that historically, the local population living in the upper quarters of Sheki had extensive experience in managing floods and fires. As a rule, as soon as a fire breaks out in the area, the local population is mobilized in small groups and quickly distributes responsibilities. The same thing happens during floods. People selected from the

community go to the mountains when there is no flood and identify the valleys where the flood comes most. Then, in each ravine, the trees are cut down and laid horizontally. The gaps between the trees are filled with twigs and small dams have been installed. These dams were built in such a way that the direction of the incoming water gradually changed and went to the forest, not to the valley. Thus, during heavy rains, the formation of water currents is prevented, and strong floods do not occur in the lower streams. This practice is still widely used in flood prevention.

Non-Governmental Organizations and Civil Society Groups

There are nearly 10 active Non-Governmental Organizations and Civil Society Groups in Sheki district. They are the independent organizations that represent a public voice in disaster risk management activities. These organizations, in partnership with governments and major groups in society, have key roles to play in promoting the objective of sustaining resilient communities to avert or reduce the impact of these disasters. DRR related awareness-raising, training, public control over the work of institutions are the main activities that is carried out by non-governmental organizations

Private business

Many national companies have a local business in Sheki. Touristic and many small farming enterprises mainly represent the private business. They are represented as shopping areas, hotels, restaurants, and small producing units. There is a broad palette of activities performed in the city that include tourism, husbandry, dairy, food, and juice production. They create very important employment opportunities to residents and reduces the vulnerability of these people.

Ministry of Education and Sheki Department of Education

Ministry of Education is a central government body that implements national policy in education. The Ministry is responsible to include DRR and ES related teaching materials and lesson plans into school curricula via national curriculum.

School preparedness activities are important parts of emergency plans. Every school has its evacuation plans confirmed by the Ministry of Emergency Situations. Regular school drills keep the level of preparedness high.

Current school curricula well reflect government policy in terms of Disaster Risk Management. The Ministry of Education is also responsible for drafting future educational policies of the government.

Work on school emergency management and DRR activities is carried out with the participation of the Local Education Department. The local education department, together with local agencies of the Ministry of Emergency Situations, inspects the level of preparedness for emergencies in schools, regulates fire safety and regularly inspects the work of school fire management teams. The assessment of emergency preparedness in schools, the satisfactory work of school rescue teams, the effectiveness of firefighting is the direct responsibility of the Sheki Education Department. Representatives of the Ministry of Emergency Situations regularly inspect schools and assess the readiness of schools for emergencies.

There are several schools in the historical part of the city. The preparation of these schools and ensuring their resilience is important both in terms of student safety and in terms of preserving the historic part of the city.

Regional Department of Ecology and Natural Resources #7

The Ministry is the main government body for protection of environment in Azerbaijan. The Sheki city is surrounded by forests from three sides. These forests serve as a buffer for natural hazards and considerably reduce risks. The Ministry controls an overgrazing and logging in mountain regions of Azerbaijan that are the main causes of landslides and flash floods. In other words, the Ministry contributes to DRR through control over the land use and environmental protection.

The Regional Department is in charge of protection of nature and forested areas in surrounding areas of the Sheki city.

The organization of fire protection works in the forests located in the territory of Sheki is carried out under the direct control of this ministry together with the Ministry of Emergency Situations.

Disaster Risk Management in Sheki City

Disaster Mitigation and Preparedness

The preparation phase is a phase that requires the implementation of multilateral proactive activities. All proactive activities are aimed at disaster risk reduction and include mitigation measures. These activities are long-term and are designed to prepare for potential threats at all levels.

Regular disaster risk assessment and mitigation activities in Sheki cover all aspects of the economy and daily life. The development process takes into consideration disaster risks, reducing the level in a particular area. Political desire, correct management and strong Disaster risk reduction institutions are essential to provide mainstreaming. Any development process and land use planning should be closely integrated with disaster risk management.

The disaster risks are reduced through key activities in these directions given in Table 1 below.

Table 1. Sectorial directions of Disaster Risk Management for Sheki City

Sector	Activities	Responsible organizations
Infrastructure	Developing disaster resistant Land Use Plans Enforcing zoning and building regulations Considering emergencies during construction of buildings Mainstreaming disaster risk into development plans Regular flood protection works in inclined areas Cleaning and deepening of riverbeds Construction and improvement of flood protection dams on the riverbanks Improvement of flood protection dams around buildings near the river Strengthening the attics of buildings Checking and increasing the earthquake resistance of buildings Regular structural and non-structural safety inspections of buildings Checking the strength and reliability of power and telephone lines Presence of fire shields and firefighting equipment in buildings Compulsory evacuation plans in buildings Regular inspection of gas leaks in buildings	Sheki District State Fire Protection Department North-West Regional Center of the Ministry of Emergency Situations Sheki District Fire Protection Department
Education	Mandatory evacuation plans in schools Compulsory civil defense groups in schools Mandatory existence of fire prevention tools in schools School Disaster Management Plans Regular inspection of structural and non-structural safety of school buildings Preparation of school building, classrooms against earthquake, fire and flood risks Simulation and drills and first aid training for students Construction of new disaster-resistant schools Basic sanitation (water, toilets, etc.) School projects concerning Environmental Protection, DRR etc. Reflection of DRR topics in the curriculum	Ministry of Education and Sheki Department of Education Sheki District State Fire Protection Department North-West Regional Center of the Ministry of Emergency Situations Sheki

Health	Regular inspection of ambulances Increasing staff preparedness for emergencies Adequate tools in hospitals Availability of medicines and first aid preparations Organization of joint work with rescue brigades Regular simulations in health facilities Establishing mandatory disaster insurance for the population (ongoing) Hospital Disaster Management Plans	Sheki Emergency and Urgent Medical Aid Service Regional point of emergency medical care Sheki Central Hospital Sheki Executive Power
Environment	Comprehensive forest management in mountains around the city Operation of Early Warning Systems (to be implemented) Regular work with residents Planting of drought resistance tree species in mountains around the city	Regional Department of Ecology and Natural Resources #7 Sheki Forest Department Sheki Department of
Tourism	Mainstreaming of disaster risks into future tourism development Increasing the earthquake resistance of historic buildings Presence of firefighting equipment in historic buildings Structural and non-structural safety inspection of historic buildings Measures to protect historic buildings on the banks of the river from floods Regular inspection of gas leaks Increasing the emergency preparedness of residents and staff of historic buildings Raising awareness for tourists Averted behavior in forests and touristic areas	State Tourism Agency Sheki Cultural Department Sheki District Fire Protection Department
Local residents, working staff in Historical buildings, schoolchildren etc.	Community DRR Civil Defence groups Simulation and drills and first aid training for students Averted behavior Community Fire Prevention works Participatory approach to DRR activities Fire prevention behaviors in houses, apartments, official buildings, and workplaces Proper knowledge on working with firefighting equipment	

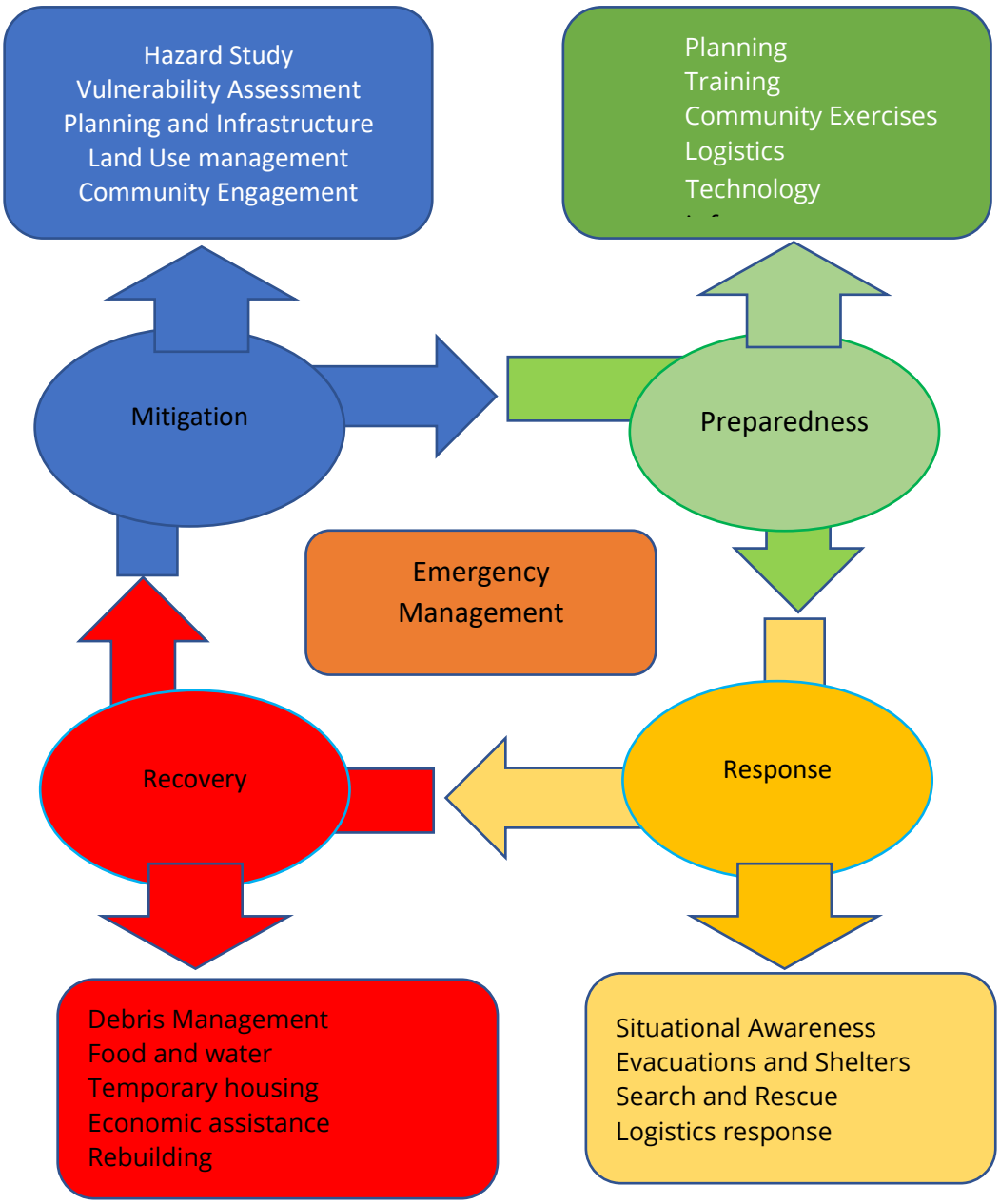
Disaster risk reduction measures are taken regularly. Control over these activities is different and is carried out by different organizations. Control is in the form of audits and is carried out regularly every year. Monitoring is carried out first by assessing the vulnerability and then by calculating the risk. The State Tourism Agency conducts regular vulnerability assessments for historic buildings and nearby buildings.

Mainstreaming is essential to disaster risk reduction. Mainstreaming, in the context of disaster risks is the practice of supporting local authorities and communities through risk conscious land planning and development. This means that regular development process takes into consideration disaster risks, reducing the level in a particular area. Political desire, correct management and strong Disaster risk reduction institutions are essential to provide mainstreaming.

Current approaches in Sheki consider mainstreaming in the city's development planning. The process of mainstreaming is regular and irreversible. The key directions, where disaster risk reduction mainstreaming is penetrated are poverty reduction, industry, tourism, agriculture, infrastructure, education, environment, housing, and health. Environmental management, water management, land use planning, gender issues, health issues, climate change adaptation are also the main directions for mainstreaming in the Sheki city.

Emergency management in Sheki and its historical part is shown in Figure 1. This management takes place through the joint activities of all the above-mentioned organizations. However, given the large number of stakeholders, the main coordination in the historical part and the adjacent areas is carried out by the State Tourism Agency and the Executive Power.

Figure 1. Emergency Management in the area



Non-emergency accidents

In the case of small-scale accidents daily, the relevant services are mobilized to carry out their duties. Information on these services is transmitted through emergency service telephones. The mentioned services and corresponding telephone numbers are as follows:

- Daily emergencies. The Emergency Service in charge of the area arrives at the scene. The phone number is 112.
- Fire cases. The fire service in charge of the area arrives at the scene and starts operating. The phone number is 101.
- When an ambulance is needed, the appropriate ambulance service is coming. The phone number is 103.

State of Emergency

According to the Law on State of Emergency, emergencies are temporary conditions caused by large-scale accidents and natural disasters. As a result, human losses, damage to human health and the environment cause great material damage, and people's normal living conditions can be disrupted. According to the legal framework, the state of emergency in the Republic of Azerbaijan shall be applied by a normative legal act adopted by the relevant executive authority.

The city of Sheki is a place where various dangerous natural and man-made events can be observed. The following dangerous events may occur in Sheki (see Appendix for more information):

- Earthquake
- Flash floods
- Debris flows
- Hails
- Fire in forests and buildings
- Heavy rains

If a disaster occurs during these dangers, then different organizations start working for different purposes, depending on the origin of the catastrophe. Table 2 shows the responsibilities of organizations during the disaster.

As soon as a state of emergency is declared, all relevant agencies act within their responsibilities. As a rule, the state of emergency is managed by the Sheki District Commission of Emergency Situations, which coordinates all organizations. During an emergency, employees' working hours, schedules, work schedule, etc. determined and regulated by that commission.

Table 2. Roles and responsibilities of organization and nessesary activities during the diaster and after it

Timeline	Organizations	İnitial Actions	Additional Actions
Before Hazard	National Hydrometeorology Department State Tourism Agency Sheki Executive Power Sheki Municipality Local Communities	Warning and Preparation	Evacuation of the sick, the elderly and children (if necessary)
During disaster	Crisis Management Center and Special emergency rescue service of MoES North-West Regional Centre of the MoES Sheki District Fire Protection Department Sheki Police Rapid Police Regiment Interior Forces (if required) Sheki Emergency and Urgent Medical Aid Service Rescue and Medical Aid Services of the neighboring districts/cities (if required)	Extinguish fire (in case of fire) Emergency rescue operations First aid activities Evacuation of wounded people Emergency search activities Emergency water, food and food supplies	Community participation Emergency and medical care from various sources
After the Disaster	Sheki District Emergency Situations Commission (All member organizations) State Tourism Agency Rapid Police Regiment (if required) Interior Forces (if required)	Rescue operations are underway The injured are being treated The evacuees are being helped Missing people are being identified The victims of the avalanche areas being searched	Fundraising for victims of disaster State support
Long-term recovery activities	Sheki Executive Power State Tourism Agency Ministry of Finance Ministry of Health	Damages caused by the disaster to historical buildings are calculated Historical buildings restored People whose houses were destroyed are housed Financial assistance is provided to suffered people	Long-term disaster relief activities

Multi-hazard assessment methodology for the Sheki city

The Hazard identification process for the Sheki city required a long and detailed analysis of existing local conditions. Identification of hazards required analysis of historical data and collection of information from the local population.

Flash floods, mudflows, landslides, hail, rain, earthquakes, and forest fires are the main hazards in the area. These hazards increase vulnerability of local communities and are of the highest significance concerning both likelihood and severity of impact on the population. However, these circumstances may vary in time and space. For example, houses close to the river are prone to floods, while areas located far from the river are prone to forest fires and landslides. Therefore, while making hazards assessment it is necessary to assess a combined effect of existing hazards, which is called multi-hazard assessment (Table 3).

Table 3. Stages of DRA and DRR procedures

#	Key stages	Actions
1	Studying the existing situation	Determining all potential hazards. Analyzing the causes, frequency and other indicators of these phenomena.
2	Assessing the existing circumstances	Determining the preparedness for impacts. (Buildings, non-structural safety, fire, equipment, DRR teams, etc.)
3	Vulnerability analysis	Determining the population's vulnerability level. Determining the most vulnerable "points" in the region.
4	Risk assessment	Determining potential loses
5	Risk reduction	Determining the risk reduction capacity

Generally, we grade safety benchmarking levels of hazard as HIGH (3), MEDIUM (2), and LOW (1). High, medium, and low risks can be identified considering the following characteristics for each hazard:

- ✓ Magnitude
- ✓ Duration
- ✓ Likelihood of occurrence
- ✓ Size of the affected area

In this methodology, we have adopted that matrix into the scoring level of hazards and that can be given as (Table 4).

Thus, hazards with various frequencies and magnitude may be scored between 1 and 5. Hazard with high frequency and magnitude is ranked as 5, while hazard with low frequency and low magnitude is ranked as 1. Details of the frequency assessments are given below. Accordingly, hazards with several frequencies and magnitude may be scored as:

5 - High frequency and magnitude

4 - Medium frequency and high magnitude, or high frequency and medium magnitude

3 - Low frequency and high magnitude or high frequency and low magnitude

2 - Low frequency and medium magnitude or low magnitude and medium frequency

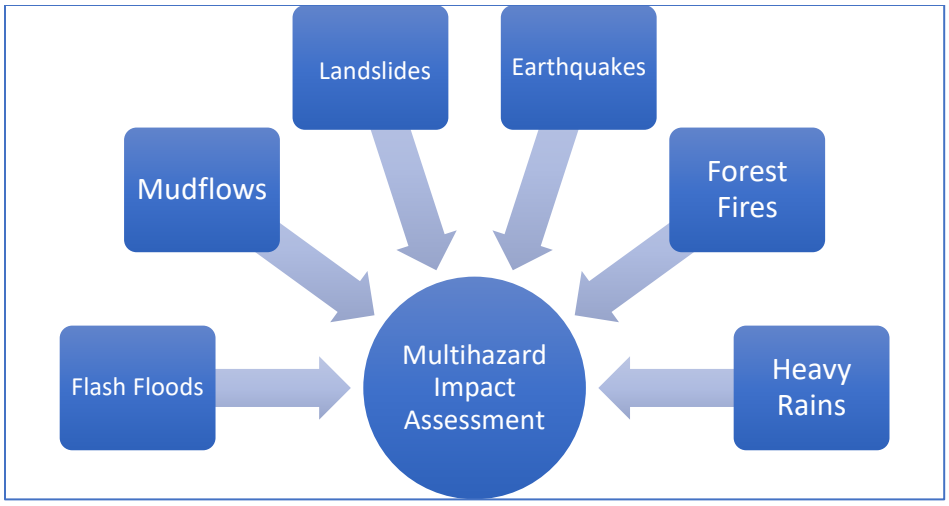
1 - Low frequency and magnitude

Table 4. Developed hazard matrix for scoring hazards

Frequency	High	5	4	3
	Medium	4	3	2
	Low	3	2	1
		High	Medium	Low
	Magnitude			

Then following scheme was used to make Multi-hazard assessment. This scheme is taken from the previous studies carried out in many countries (Figure 2). The idea of making a multi-hazard assessment is based on bringing all the hazard impacts together and make combined map of hazards. Multi-hazard assessment well demonstrates total impact of hazards that would turn into disasters. In most cases, multi-hazard maps reflect not all hazards but are based on the hazards that happen frequently and have potential to turn into the disaster.

Figure 2. The scheme for making a multi-hazard assessment



Vulnerability Assessment

After an analysis of all reviews and the existing conditions, vulnerability assessment should be performed. Regular assessment of the vulnerability contributes to rapid detection and solution of any existing problems in the buildings and city. The vulnerability assessment consists of two parts. The first part is to assess vulnerability in the city. This assessment mainly examines the condition of roads and infrastructure, the possibility of evacuation in the event of a disaster, as well as opportunities to help the population after the disaster. The vulnerability assessment also examines the condition of evacuation routes and the level of energy, water, and gas supply.

In the second part, the condition of individual buildings is studied. The building means historical buildings, school buildings, catering facilities, hotels, government offices, etc. understood. Assessment acts as a foundation for drafting of comprehensive preparedness plans. In the current stage of assessment, the priority is given to the heritage buildings and building located very close to them. It is understood that fires, collapse, or something related to those non-heritage buildings may damage heritage buildings as well. For example, fire happening in a school building that is located very close to the historical building is potential damage.

The vulnerability assessment has been drafted exclusively for the Sheki and must be adjusted for the local conditions when it is applied in other areas. In this assessment, the natural conditions, the structural and non-structural safeties and the preparedness level of the building residents and workers were considered.

According to this methodology, vulnerability assessment should be conducted by a check-list. Each indicator consists of answers of Yes and No (Table 5). Each 'Yes' answer is scaled by '0', while each 'No' is scaled by '1'. Some answers are scaled between 1 and 5. In the end, the

obtained figures are added, and the resulting total figure becomes the indicator of the vulnerability, which in its turn enables to determine the level of disaster risks. In this case, the school with the lowest degree of preparedness for disaster risks gets 60 scores, while the building with the highest degree of preparedness gets 0 scores (Table 5).

According to vulnerability scoring, vulnerabilities are classified at 5 levels:

- 5 - Very High Vulnerability (Scoring is between 51-60)
- 4 - High Vulnerability (Scoring is between 41-50)
- 3 - Medium Vulnerability (Scoring is between 31-40)
- 2 - Low vulnerability (Scoring is between 21-30)
- 1 - No vulnerability (1-19)

Table 5. Vulnerability assessment for historical buildings and Sheki city

Location of the building		
Purpose of the building (historic building, hotel, restaurant, office, residential house, hospital shop, school, etc.)		
Weakness indicators	Vulnerability Scores	Response
The general condition of the building	0-Very good, 1-good, 2-medium, 3-bad, 4-very bad, 5-damaged	
Is the attic of the building new?	Yes-0, No-1	
Are the walls in good condition?	Yes-0, no-1	
Is the building close to the landslide zone?	No-0, Yes-1	
If it is close, what is the distance between the landslide zone and the building?	more than 100m-0, 50-100m-1, 30-50 m-2, 20-30 m-3, 10-20 m-4, less than10m-5	
Is the building close to the river?	No-0, Yes-1	
If so, what is the distance between the river and the building?	100 more than 100m -0, 50-100m-1, 30-50 m-2, 20-30 m-3, 10-20 m-4, than10m-5	
Is the building located in a sloping area?	No-0, Yes-1	
If there is a lot of inclination, how much?	Less than 20^0 -0, 20^0-30^0-1, 30^0-40^0 -2, 40^0-45^0 -3, 45^0-50^0 -4, more than 50^0	
Is the building close to the main road?	No-1, Yes-0	
Is access to the main road easy?	No-1, Yes-0	
The distance between the main road and the building	More than 100m-5, 50-100m-4, 30-50m-3, 20-30 m-2, 10-20m-1, less than 10m-0	
Is the main road close to a flooded river?	No-0, Yes-1	
Is there a firefighting desk in the building?	Var-0; No-1	

Is there a fire extinguisher in the building?	Var-0; No-1	
Is there a fire hydrant in the building?	Var-0; No-1	
Are the entrance and exit doors wide?	No-1, Yes-0	
Is it easy to drive out of the yard?	No-1, Yes-0	
Does the building have a courtyard?	Var-0; No-1	
Is there water in the yard?	Yes-0; No-1	
Are there many items hanging inside the building?	Yes-1, no-0	
Is the furniture fixed to the wall?	Yes-0, no-1	
Condition of gas pipeline	Bad-1, good-0	
Condition of power lines	Bad-1, good-0	
Does the building have an evacuation plan?	No-1, Yes-0	
A survey among building residents and employees	No-1, Yes-0	
Do you have a steady and steady income?	No-1, Yes-0	
Is your income enough to live on?	No-1, Yes-0	
Which class would you belong to?	Rich-0, Medium-1, Poor-2, Very poor- 3	
Your level of education	Medium-1, High-0	
Do you know about natural hazards in the area? (for example, earthquake, hail, flood, landslide, etc.)	No-1, Yes-0	
Are you constantly interested in the readiness of your building for any danger?	No-1, Yes-0	
Is there an early warning system in the area?	No-1, Yes-0	
Are there community groups at risk in the area?	No-1, Yes-0	
Can you give examples of what you would do during an earthquake?	No-1, Yes-0	
Can you give examples of what to do during floods and heavy rains?	No-1, Yes-0	
Can you give examples of what to do in case of fire?	No-1, Yes-0	
Is there any training on dangerous events in the area so far?	No-1, Yes-0	
Is there any community group in the area against natural hazards?	No-1, Yes-0	
Do you sort solid waste in your home?	No-1, Yes-0	
Is solid waste transported regularly?	No-1, Yes-1	
Do you have a car?	Yes-0, no-1	
Do you or your neighbors have a bulldozer?	Yes-0, no-1	
		60

Risk Assessment

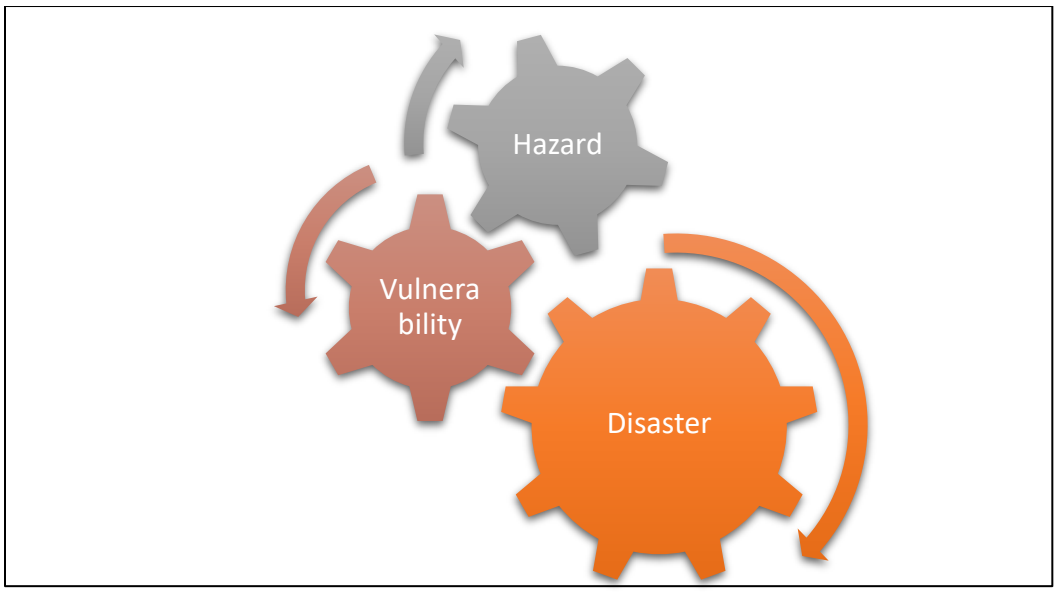
Risk Assessment requires determining preparedness and vulnerability levels in communities, assessing the existing situation, and determining any potential losses. The risk evaluation does not only determine which losses may arise from disaster, but also shows the causes of the losses and suggests the ways of reducing them.

In the classical DRR literature, the following formula describes the disaster risks that include hazard, vulnerability, and capacity components:

Disaster Risk = (Hazard x Vulnerability)/Capacity

As seen from the formula, although the high level of the hazard and vulnerability increases the risk of disaster, while the high level of capacity reduces the disaster risk. It means that a systematic increase in the capacity may prevent most of the disasters. The following diagram shows what can be caused is to put hazard and vulnerability together (Figure 3).

Figure 3. Hazard and Vulnerability together cause disaster



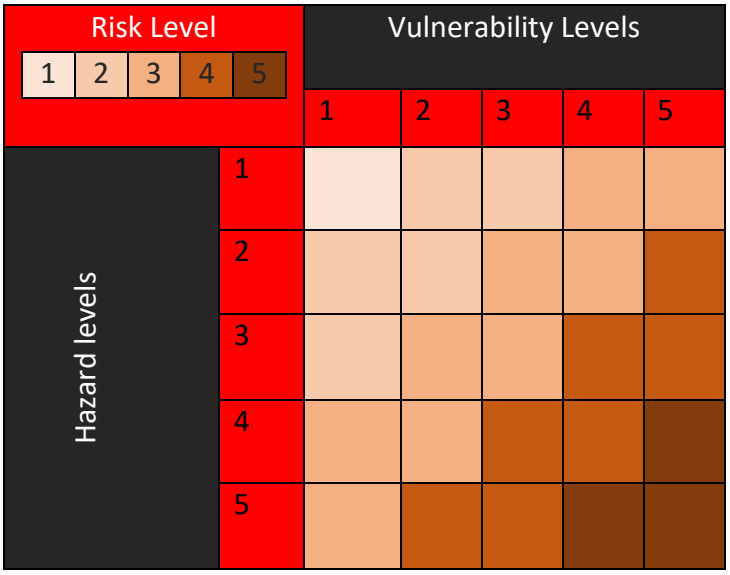
To assess disaster risks, the following scheme has been applied:

1) According to the developed hazard matrix, hazards are scored between 1-5
2) According to the Vulnerability scoping, Vulnerabilities are scored between 1-5
3) Risk is assessed as a sum of Hazard risk at five levels

a. Very High Disaster Risk (9-10)
b. High Disaster Risk (7-8)
c. Medium Disaster Risk (5-6)
d. Low Disaster Risk (3-4)
e. Very low disaster Risk (1-2)

The following diagram shows disaster risk levels assessed from various vulnerability and hazard levels. According to the diagram, if the sum of the vulnerability and hazard levels is higher than 8, then there is a very high risk for the disaster (Figure 4).

Figure 4. Risk matrix for buildings (including historical buildings)



Natural and manmade hazards in the Sheki City

Flash Floods and Debris Flows

A flash flood is a rapid flooding of low-lying areas: washes, streams and depressions. If there is a town or other settlement in the depression, then serious damage occurs. Flash floods may be caused by heavy rain associated with a severe thunderstorm, hurricane, tropical storm, or meltwater from ice or snow flowing over ice sheets or snowfields. The city of Sheki is located in a depression, where flash floods occur intensively.

All rivers in the Sheki region are highly flooded. More than 70% of the mudflow is a dangerous flow of water to rocks, mud and other solid materials. Kish and Shin rivers located in the Sheki region are rivers with high flood intensity. Also, the intensity of floods in the Gurjana River is increasing. In recent years, floods have been observed in the Gurjana River during heavy rains in the mountainous areas around the city. These floods are mainly mudslides, in which the water fills the basements of historic buildings, destroys roads and poses a threat to historic buildings.

Debris flows are geological phenomena in which water-laden masses of soil and fragmented rock rush down mountainsides, funnel into stream channels, entrain objects in their paths, and form thick, muddy deposits on valley floors. During debris flows, more than 70-80% of the river flow is made of solid materials. Due to their nature, debris flows can be rocky, rocky-muddy and muddy. Floods are the transport of solid materials, mud and stones that have been eroded in the basin for a long time, along with water.

Floods usually start suddenly. As a result of heavy rains and sometimes rapid melting of snow, water flowing from the mountain slopes brings with it clay, sand, gravel, stones and even pieces of rock. The flood destroys everything in front of it, destroys crops, destroys water facilities, communication and power lines, bridges, and poses a very serious threat to the population.

Physical and geographical factors influencing the formation of floods in the Sheki city are divided into three groups:

1. Steep slopes (Exists in mountain areas that surrounds the city)

2. Presence of eroded brittle, fine, easily washed and easily balanced rocks on the slopes of the basin and basin (the Gurjana basin has eroded rocks)

3. Availability of sufficient water that can cause solid materials to move up the slope (sudden rains with high intensity are always observed in the Gurjana basin)

Significant fragmentation of the terrain on steep slopes and even heavy rains in the area causes severe floods. Urbanization in the area increases the frequency of floods. Deforestation and deforestation in the area, destruction of vegetation for various reasons, overgrazing significantly increase the risk of floods. As a result of these measures, the process of erosion and denudation in river basins intensifies, and new floodplains appear.

The main measures to combat floods are the construction of dams, prevention of overgrazing of the basin, protection of vegetation and forests. Increasing people's preparedness for floods is also an important way to fight.

Landslides

Landslides are observed on mountain slopes and steep banks of mountain rivers. Landslides are a process that usually develops in soft and poorly cemented rock layers. In addition to the presence of soft and weakly cemented sediments, the steepness of the slopes and the presence of groundwater are the main conditions for the landslide to occur.

Landslides on the steep banks of rivers usually start from the steep or very sloping zone of the coast and develop upwards on the slope.

Most landslides occur in the following order. The water circulating through the aqueous layer moistens the surface of the waterproof layer and makes it slippery. When the volume of the rock layers lying on the surface of the wetted waterproof layer is too large, the force of gravity repels the adhesion force and the top layer loses its balance and moves down the slope depending on the general geomorphological conditions. This movement is either fast or weak and lasts for a long time.

When a landslide begins, a semicircular crack is formed between the sliding mass and the main slope. The part of this crack that remains under the sliding mass is called the sliding surface. As the landslide develops, the crack between the sliding mass and the main slope widens over time. A crack is called a rupture or separation surface. After the sliding mass moves to the lower part of the slope, the integral surface rises above the sliding surface like a vertical wall. Depending on the height of the slope and the thickness of the sliding mass, the height of the steep separation slope can range from a few meters to tens of meters. In the place of the sliding mass, a circus-like depression is often formed, which is called a landslide or a landslide depression.

In mountainous areas with steep slopes, deforestation and overgrazing weaken the adhesion of the topsoil, resulting in soil erosion. When erosion intensifies, landslides can occur.

Landslides cause great damage to the economy, destroy roads and buildings, destroy crops and pastures, and accelerate the process of siltation of reservoirs. Landslides can cause homes to collapse and people to die.

The city of Sheki is in an area where historically landslides have occurred intensively. Landslides are one of the main dangerous events in Sheki. In many parts of the historical part, the slope reaches 60-70 degrees. Landslides are inevitable in these areas.

Studies have confirmed the existence of several ancient landslide sites. One of these areas is in the upper part of the heating spring. It is unknown when this historic landslide occurred. When this landslide occurred, a large mass of soil broke off the mountain slope and came down 150-200 meters.

The most known landslides of recent years is the landslide in the southern part of the city. The area includes parts of the Mother Monument and the War Museum. Strong landslides were observed here in 2011-2013. In 2015, numerous landslides were recorded not only in the historical part but also in nearby areas. Another landslide was observed in 2020 in the upper part of the city in the direction of the Markhal-Khan plateau.

Heavy rainfall hazards

Heavy rain is the short-term fall of high-intensity rain on the earth's surface. This type of rain always causes strong floods and mudslides but also causes various damage to buildings.

Many showers of rain can be dangerous to various sectors of the economy and human society due to their frequency, duration, intensity, area of distribution and quantity. Such rains are called hazardous rains. Particularly hazardous precipitations include rains with a layer of more than 30 mm and a duration of fewer than 12 hours, and showers with a layer of more than 30 mm and a duration of less than 1 hour. According to the amount of precipitation per day, heavy rains are divided into particularly heavy (70 mm/day) and catastrophic (100 mm/day and more).

The Sheki-Zagatala region is one of the main regions in Azerbaijan with heavy rains. Heavy rains are observed in Sheki and surrounding areas in almost all seasons. This creates conditions for intensive floods in some parts of the mountains with steep slopes.

Long-term observations show that heavy rains in Sheki are observed in all seasons. As a rule, the intensity of daily precipitation can be 50-70 mm, which is very high. Rainfall with the intensity of 6.4 mm/sec was observed in Sheki for 5-6 minutes.

Table 6. Hazardous rains observed in Sheki

Date	Precipitation, mm	Consequences	Date	Precipitation, mm	Consequences
17.05 2017	32		12.05.2019	23	
01.06 2017	59	Roads and sidewalks were destroyed.	21.05.2019	56	Roads and sidewalks were destroyed. The Gurjana river overflooded.
08.04 2018	71	About 10 house buildings were seriously damaged	07.09.2019	20	
07.09 2018	65	Roads and sidewalks were destroyed	08.09.2019	72	Roads and sidewalks were destroyed. Dirty sewage mixed with rain overflowed and filled the yards of houses. The Gurjana river overflooded.
19.07 2018	73	The water brought rubble and stone sand along the asphalt road. Heavy rains flooded homes in the city's 98th quarter. Yards and basements of houses are flooded.	22.07.2020	69	Nearly 10 houses were damaged. The Gurjana river overflooded.
			02.08.2020	79	In some parts of the city, about two meters of asphalt and more than 20 houses were severely damaged.

Thunderstorm Hails

The hail is a round or irregularly shaped piece of ice, 5-50 mm in diameter, sometimes larger. It is also possible to come across hailstones ranging in size from 130 mm to 1 kg. Hail grains consist of transparent ice layers not less than 1 mm thick. Hail usually falls from densely packed clouds during the warmer months of the year. The falling hail layer sometimes reaches several centimeters. The hail lasts from a few minutes to half an hour. In general, the duration of looting can reach 5-10 minutes, and in some cases up to 1 hour. Hail grains are formed as a result of the formation of individual droplets that accidentally freeze in an over-cooled cloud. Later, these droplets begin to take on larger dimensions due to other frozen grains that collide with them.

Hail has caused extensive damage to farmland, buildings and vehicles. The hail is seriously damaging agriculture in particular. The consequences of the damage done to developing agricultural products are great. The scale of this damage depends on the size, density and duration of hailstones. Hail is observed everywhere and in every season, especially in spring and summer. The later the hail spring, the greater the damage. Destruction of hail crops can lead to the death of large and small horned animals, as well as the deterioration of vegetables and fruits.

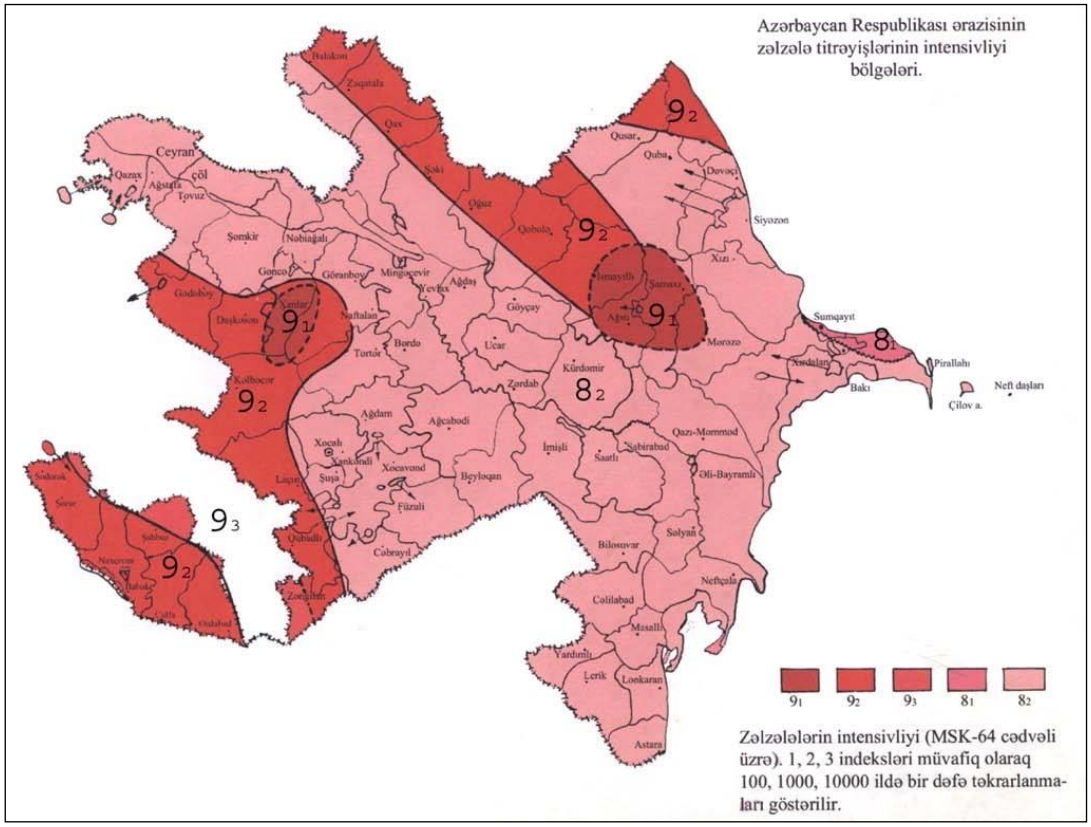
The city of Sheki is a place of frequent hailstorms. Hail is observed here several times a year. The average annual number of hail days in Sheki is 2.4, i.e. it rains an average of two or three times a year. Mountainous terrain, high heat and high evaporation in the summer months are the main factors of hail in Sheki. On March 6, 2016, the diameter of the hail observed in Sheki was greater than 1 cm. As a result, the attics of houses, electric poles, livestock and gardens were severely damaged. On June 5, 2016, hail fell on the city, damaging houses, telephone lines and gardens. On March 13, 2018, the diameter of the hail falling on the city was 1 and 2 cm, respectively, and the houses were severely damaged.

Earthquakes

Earthquakes are the most destructive natural threat. The whole territory of Azerbaijan is considered an earthquake danger zone. Based on information about earthquakes since ancient times, experts have compiled seismic zoning maps of Azerbaijan. According to MSK-64 intensity scale, the total territory of Azerbaijan is included to the area with the earthquake hazards of 7 (very strong), 8 (damaging) and 9 (destructive) scores. The territory of Gabala district coincides with the 9 and 8 score zones. The intensity of an earthquake indicates the degree of vibration on the earth's surface and is measured in points. Magnitude scales, like the moment magnitude, measure the size of the earthquake at its source. Magnitude is expressed in whole numbers and decimal fractions. For example, a magnitude 5.3 is a moderate earthquake, and a 6.3 is a strong earthquake.

The map effectively shows that all the territory of the Sheki city can be included in the region, where earthquake hazard is high (Figure 5).

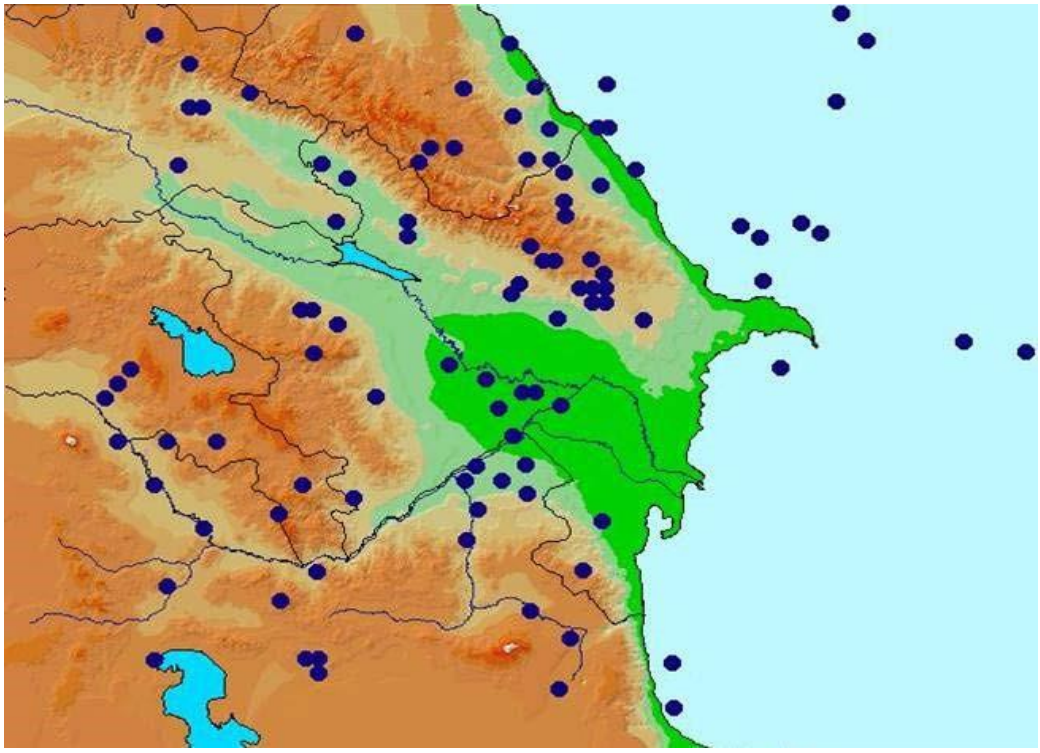
Figure 5. Seismic Activity in Azerbaijan



It is very important to note that in most cases local population have not enough memory regarding past earthquakes that can be explained by slow frequencies of quakes. This is a usual phenomenon for all quake hazards. Unlike floods and landslides, the recurrence interval of catastrophic quakes reaches 100-120 years.

The map below shows (Figure 6) the epicenters of earthquakes in Azerbaijan in 427-1930. As can be seen from this map, the epicenter of two of the strongest earthquakes of the last two millennia was in the city of Sheki. In addition, the Zagatala earthquake in 2012 was felt in Sheki. On September 4, 2015, a 7-magnitude earthquake was registered in Sheki. The quake caused cracks in some houses in Sheki. According to Sheki residents, cracks appeared in the walls of some houses after the earthquake. The last earthquake was registered in Sheki on September 4, 2020, and the magnitude of the earthquake was 4.

Figure 6. Epicenters map of earthquakes (M≥5,0) happened in Azerbaijan territory in 427-1930.



Forest Fires

Forest fires are mass burning of forests. Forest fires occur as a result of prolonged dry and rainless weather. Small pastures and bushes in the forest dry up and conditions are created for their burning. Forests can also burn due to negligence. This is often due to tourists and people in the forest building fires, smoking and not following the rules. The territory of Sheki is one of the most vulnerable areas to forest fires. Experts from the Ministry of Emergency Situations (MES) say that the main cause of forest fires in this area is directly related to peoples' behavior. According to official statistics, 9 out of 10 fires in Azerbaijani forests today are caused by careless handling of fires or violation of fire safety rules by people during work and rest in the forest.

Most of picnics and recreation areas in the suburban green of Sheki city zone are not "authorized" picnic areas. These are the places chosen by tourists accidentally who come to the forest for picnic. Garbage piles and plastic waste are found in such places frequently. Tourists visiting the area do not follow fire safety rules and other environmental regulations. Therefore, a lot of work

needs to be done to better manage picnic areas and hiking trails, and more specifically, these activities are described in the recommendations section.

The previous practice shows that the forests in the area are very sensitive to fire, and there have been several large-scale fires in the area over the past 10 years. Since 2014, 6 fires have been registered in the area. However, according to locals, there are many unregistered fires, which are usually extinguished with the active participation of local communities. The last fire occurred in late February 2020 and was extinguished because of the initiative and activity of the local population.

Building Fires

Fire is an uncontrollable, life-threatening burning process that destroys material goods. The main physical and chemical events that occur in a fire are the chemical reaction between combustible substances and atmospheric oxygen, the release of large amounts of heat and the intensive exchange of gases formed as a result of combustion.

Fires are often the result of careless handling, improper fire safety measures, spontaneous combustion of materials, static electricity discharges, and lightning strikes, etc. Many combustion products released into the air by smoke during a fire (especially when burning polymeric substances) are toxic to the body. In some cases, incomplete combustion products (e.g. carbon dioxide) form an explosive mixture with oxygen.

Fires are more dangerous in facilities where flammable substances are produced and stored. There are about 30 such places in Sheki. These include not only buildings but also gas stations, oil and gas storage facilities, etc. Like many residential areas in Azerbaijan, Sheki is a rather vulnerable place to fires. The results of the initial monitoring of the historical part confirm that fire safety measures are still not taken in most houses and buildings. The fire sensitivity of these buildings is very high, as wooden materials are widely used in most of the old buildings. The high risk of fire in schools, kindergartens and historic buildings is also due to the lack of knowledge among the population. Thus, the local population often does not know what to do in case of fire.

Structural Safety

Structural safety is mainly determined by the condition of the buildings. List of buildings in the historical part includes historic buildings, offices, museums, schools, hotels, restaurants and all ancillary buildings. Old, unusable buildings that do not meet safety requirements significantly increase the risk of disaster. For example, the earthquake on September 4, 2015, in Sheki caused

cracks in some houses and very old buildings became unusable. At the same time, the buildings in good condition were not damaged. Therefore, the condition of buildings must be considered when assessing disaster risks in buildings.

In addition to the above, the location of the building is a very important factor with respect to disaster risks. The building cannot be built in places where frequency and duration of natural hazards are high. For example, a building should not be constructed in an area prone to landslides or in areas where there may be flooding. At the same time, military facilities, factories, fuel depots and potential sources of pollution should be kept away from buildings. In addition, it is better not to have emergency exits in buildings on the streets with heavy traffic.

Buildings located near a river or other water source should be outside the flood zone. If the building is in a floodplain or similar area, it must be high enough so that the normal rise in water level does not turn into a disaster. Where there is frequent rainfall or unpredictable rainfall, buildings should be equipped with drainage and sewerage systems to cope with the maximum level of expected rainfall. This factor should be considered when designing corridors, windows and other architectural elements.

Non-Structural Safety

Non-structural security is the reduction of the danger posed by things inside buildings that are not related to structural work. Non-structural elements include suspended ceilings, windows, doors, furniture, computers, electrical appliances, heating, ventilation and air conditioning equipment, piping and electrical systems, emergency generators and similar equipment, and so on.

Particular attention should be paid to the design and construction of roofs, water tanks, information boards and antennas in areas exposed to hurricanes or strong winds. Some elements of the building and nearby structures must be able to withstand such hazards, or they must be constructed in such a way that they can be easily removed if necessary. The use of galvanized iron sheets or ceiling tiles, which can fall to the ground and become a source of death, should be avoided.

In any case, non-structural mitigation activities should be identified taking into account the results of hazard, risk and sensitivity assessments, both in the building and near the building.

It should be noted that in addition to the above conditions, the impact of other local factors should be considered during the assessments. For example, inspections of many buildings have shown that groundwater poses a serious threat to the foundation and sidewalls of the building and reduces the durability of the building.

Furniture, equipment and materials used for people of different ages should meet the general requirements. For example, furniture and items should not have sharp corners or other elements that could injure or otherwise injure people. Furthermore, it is necessary to use non-toxic and fire-resistant colors and materials.

In buildings located in an earthquake zone, tables and furniture must be prepared to protect during an earthquake. At least one person must be able to defend himself under each table. Tables, on the other hand, must be designed specifically to sustain a certain effect.

Furniture, equipment, and building materials must be used and placed in such a way that they do not fall on people during an earthquake and prevent evacuation routes.

Bookshelves and other large pieces of furniture should be fixed to the wall. Heavy objects should not be stored on the top shelves of furniture, glass, dishes, chemicals and other materials that can cause damage should be stored in a safe place.

Furniture should always be kept in working condition. The design, manufacture and selection of furniture must be in accordance with its purpose. Without proper maintenance and care, the safety features of furniture deteriorate over time. Therefore, it is necessary to repair the furniture regularly. In addition, a number of elements, including the location of furniture, their secure fastening to the walls, and the protective devices and mechanisms that ensure their safe use, need to be inspected frequently.

Buildings must be equipped with fire extinguishers, fire hoses, shovels, first aid kits and emergency rescue equipment. The building must have an emergency lighting system to be used in the event of a power outage. Buildings must have appropriate signs indicating evacuation routes, safe places in case of emergencies or natural disasters, collection point, location of emergency rescue equipment. The evacuation plan of the building should be posted on the wall where the emergency service telephone numbers are visible.

Hazards and Disasters

Hazards are the main circumstances that are continually observed and may cause material and moral losses. Any natural or manmade phenomena that can turn into the disaster can be considered as a hazard. The hazards may turn into disasters where no preparedness actions are taken against them. Specifically, even the circumstances that are regarded ordinary in nature may become a disaster for the society if no readiness and response actions are taken by the society. For example, if a flood is observed as a hazard, simultaneously it may destroy the historical buildings and turn into a disaster. Another example is forest fire. If there is a forest fire in an area and there are not enough material and human resources to extinguish it, if there is no

proper preparedness level for fire prevention, if there are not enough fire extinguishers, then the fire can turn into a major disaster. In other words, disasters are circumstances that could be harmful to a person's life, normal operation or property and upset social and economic balances. An example of turning of flood hazards into the disasters is given in Table 1.

Key hazards observed in the territory of Sheki are flash floods, debris flows, heavy rains, hails, earthquakes, landslides and forest fires. Due to ongoing climate changes, frequency and magnitude of these hazards will likely rise. Over the last decades, the scale of damage resulting from these natural circumstances has significantly expanded which in its turn demonstrates a low level of preparedness of the society.

The total impact of the factors that question the preparedness level of any community or society for any potential hazard is vulnerability. For example, lack of early warning systems in case of floods, potential fall of historical buildings due to oldness of the construction, low preparedness level of the working staff, lack of an evacuation plan in the school, and poor condition of roads are considered factors of vulnerability.

A risk is an assumption for any potential result due to natural disasters. For example, the assumption of the destruction of a historical building as a result of an earthquake is a risk. Surely, if the building is resistant for a high magnitude earthquake, then, the risk of its destruction will be significantly lower.

Several studies confirm that there are close relationships between poverty and disasters. Poor societies, communities and families have less capacity to meet hazards. Poverty worsens the adverse effects of disasters on societies, increasing the number of people suffering from it. For example, in 2016 floods in Kishchay, poor families in Kish village suffered notably more than the wealthy families.

Capacity means mobilization of the power, attributes and reserves by a community, school staff or organization to achieve any of their goals. For example, availability of an early warning system during floods, strength of school buildings, high preparedness level and wealthy conditions of schoolchildren and low poverty level may be regarded as capacity.

In assessment of a risk, potential natural disasters in the territory are determined and their possible results are evaluated. The risk assessment requires determining preparedness and vulnerability levels in communities, assessing the existing situation and determining any potential losses. The risk evaluation does not only determine which losses may arise from a disaster but also shows the causes of the losses and suggests the ways of reducing them.

In the classical DRR literature, the following formula describes the disaster risks that include hazard, vulnerability, and capacity components:

Disaster Risk = (Hazard x Vulnerability)/Capacity

As seen from the formula, although a high level of the hazard and vulnerability increases the risk of disaster, while a high level of the capacity reduces the disaster risk. It means that a systematic increase in the capacity may prevent most of the disasters. The following is the schedule of determining disaster risks while flood accidents.

DRA includes several stages that are mostly separated into the hazard identification, vulnerability analysis, and risk assessment. In this study, five stages of DRA and DRR is identified (Table 2).

There is a need for a detailed survey to assess the Disaster Risks in areas, which also necessitates the following studies:

- ✓ Determining hazards occurring in the area
- ✓ Collecting historical information on all hazards, by using scientific and observation data
- ✓ Determining the impact of climate changes on the frequency and duration of hazards
- ✓ Determining human-based risks (e.g., fire)
- ✓ Analysis of human-based actions that may increase the disaster risks
- ✓ Assessing the emergency services (firefighting and the first aid)
- ✓ Assessing resistance of the buildings to hazards
- ✓ Availability and of regular updating of Emergency Plans
- ✓ Mainstreaming DRR into the development
- ✓ Regular assessment of Disaster Risks
- ✓ Assessing the knowledge and skills of people
- ✓ Availability of an early warning systems
- ✓ Reviewing the work level of the Disaster Risk Management Team

Table 7. Turn of flood into a disaster under certain circumstances

Hazard	Vulnerability	Risk	Risk reduction
Gurjana river flood	The dams along the river banks are not adequate; Historical building is very old;	The houses close to the dams may collapse. Children, aged people and disabled persons may lose their lives; The historical building may collapse	Reinforcing the dams along the river banks
	There are no vehicles to rescue people from flash floods.	People may lose their lives.	Availability of cars, rubber boats and life belts
	Many buildings are located at floodplains	Buildings may get flooded. Food shortage may occur.	Planting of buildings at the places where the risk of flooding is lesser; reinforcing the dams
	The working staff in historical building and local population do not know when floods may occur	People may lose their lives.	Protecting buildings with dams, establishing an early warning system
	The working staff and residents does not know what to do in case of flood	People may lose their lives; The school building and equipment may break up	Establishing the early warning system, Preparedness of the working staff and local populaiton.