

## INVESTIGATION OF FLOODING EVENT IMPACT ON TERRITORIAL PLANNING IN THE SHAKI DISTRICT

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**Abstract.** *In the article, the impact of natural disasters on regional planning in the Sheki region has been studied. It was determined that flood events have the greatest influence in the research region. The villages and localities where natural disasters occurred were studied, the degree of its impact, the number of the affected population and the number of families were studied. The flooding effect on agriculture, farmland and livestock were analyzed, scale and areas of villages and places were calculated. During the research, the information of the Ministry of Emergency Situations and the State Statistics Committee was used and a corresponding map was prepared. At the end relevant suggestions were given.*

**Keywords :** *natural hazards, territorial planning, Shaki district, Greater Caucasus, flooding*

### Introduction

Settlement of the population, development of agricultural areas and the application of modern technology in territorial planning reduce natural disasters, but at the same time they also affect their increase (Chaudhary, M.T.; Piracha, 2021). As a result, the areas affected by natural disasters are expanding, the number, scale, type, power and intensity of recurrence of risky areas are increasing as well. (Linnerooth-Bayer, Amendola, 2000) Sheki-Zagatala economic region is one of the most affected territories by natural disasters in our Republic. (Nazarov E, 2011) In this region where all types of natural disasters, including flood, inundation, landslide and earthquake events are frequently observed. Currently, 171 settlements with a population of 400,000 people, including 55,000 or 55.8% of the 98,000 families in the region, are at risk of flooding. (Pashayev.N. , p 58) The Shaki region is the most affected by natural disasters and the highest level of damage is recorded. At the same time, Sheki is the political and economic center of the region that increases the urgency of this problem. The largest rivers of the Greater Caucasus flow into the region lead to an increase in damage. 29 villages in Sheki district (including Sheki city) are flooded, which accounts for 41.2% of rural areas. Flooding events in the area have extensively damaged the economy and social infrastructure of the region during the various periods. The most serious and dangerous incidents were recorded in the city itself. In the city during a flood event, overflow of sewage systems and leaks into the streets, flooding of residential areas and catering facilities; in riverside settlements in areas where floods occur in rural areas damage agriculture, farmland and livestock.

### Material and Methods

Name	Total area (ha)	Flooded area (ha)	%
Crop land	69596	18848.5	27.1
Summer pastures	55731	9153.5	16.4
Forest field	40160	11749.3	29.3

Figure 1.

*Flooding influence on agriculture and forest areas*

The greatest and most severe damage was caused to forest and cultivated areas. (Figure 1.) This constitutes 56.4% of the total area. Together with summer pastures, 72.8% of the area is exposed to flooding. Considering that the bulk of the Sheki region's economy and most of the population's income comes from agriculture, this is a huge figure for the district. There are different forms of damage, flooding of arable land, planting and other products fall into disrepair.

Name	Height above sea level	Total area	Flooded area	indicator percent (%)	Distance from the river	Population	Existing families	Flood-affected families	%
Bash Kungut	850	103.071	55.725	54.1	200	1498	380	130	34.2
Bash Layısky	1030	155.3	80.4	51.8	650	2184	337	310	92
Shin	1010	78.1	39.3	50.3	270	1543	325	325	100
Bash Goynuk	850	322.2	150.6	46.7	440	7597	1548	825	53.3
Kish	1175	224.9	103.4	46	130	6687	1348	1348	100
Okhud	900	227.3	101	44.4	400	4825	1100	794	72.2
Baltali	325	260.2	109.6	42.1	900	2051	460	400	86.9
Varazat	850	63.9	26.8	41.9	35	1790	349	125	35.8
Gudula	240	116.5	47.5	40.8	60	621	184	172	93.5
Baggal	420	28.9	11.7	40.5	160	528	122	73	59.8
Ashaghi Shabalid	525	66.9	26.4	39.5	940	672	140	137	97.8
Bash Zayzid	800	220.9	74.3	33.6	0	4788	1007	795	78.9
Gorkhmug	325	212.5	63.9	30.1	460	4853	1000	820	82
Ashaghi Kungut	420	235.7	64.4	27.3	160	1358	465	265	57
Junud	650	67.1	18.3	27.3	30	1010	190	136	71.6
Kondalan	655	45	12.1	26.9	170	844	169	132	78.1
Bidayiz	650	134.7	35.4	26.3	200	1278	280	138	49.3
İnja	500	59.4	15.4	25.9	0	1355	308	274	89
Zunud	600	90.1	23	25.5	130	1339	272	147	54
Bash Kaldag	900	61.6	15.7	25.5	210	1053	259	47	18.1
Bash Shabalıd	800	53.9	12.8	23.7	0	871	183	175	95.6
Shaki city	500	15851	374.1	23.6	300	62965	13327	13136	98.6
İkinji Biləjik	300	150	33.6	22.3	200	1198	263	154	58.5
Gumukh	500	59.3	12.8	21.6	230	4853	25	25	100
Ashaghi Kaldag	445	20.7	4.4	21.3	270	96	24	19	79.2
Oraban	850	69	12.1	17.5	700	1069	233	68	29.2
Orta Zayzid	500	219	37.9	17.3	130	3035	825	417	50.5
Birinci Biləjik	315	120	18.6	15.5	240	1500	331	125	37.8
Babaratma	225	70.1	7.2	10.3	350	319	62	46	74.2
Total		5120.671	1534.325			123780	24691	21558	

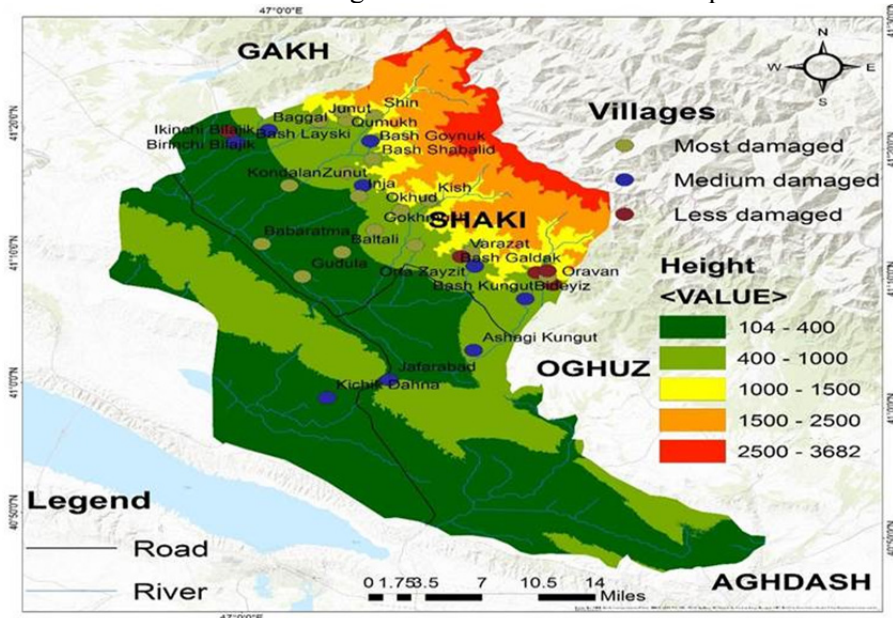
*Villages affected by flooding process between 2000-2017 years.*

*Ministry of Emergency Situations and the State Statistics Committee ASSC 2009.*

The table above shows flood events that have hit the area for 17 years. Villages and settlements affected by floods and inundations, depending on their distance to the rivers, the number of affected populations, as well as the number of families, were generally identified as flooded areas. The highest incidence was recorded in rivers and nearby villages, where floods with high cone levels were observed. Sometimes these floods account for 40-50% of the total flood area. Similarly, this leads to an increase in the number of affected people as well. After the outbreak of floods in the area surveyed, the number of people affected and the damage has been determined.

## Methodology

In this paper, we have used the following research methods. Based on these research methods we have determined major flooding areas where people suffered recorded with high damage. A survey of literature of natural hazards on territorial planning and its economic influence have been reviewed. Thus, the report analyses and estimates the hazard, vulnerability and risk based on the historical events that have impacted the region over the last 17 years (2000 to 2017). In this study, the intent is to quantify the risk directly based on recorded historical losses. This approach is much simpler than the standard probabilistic methods but provides reliable estimates so long as records cover a sufficient period



*Flooding impact and their grades in Sheki district (Prepared based on Ministry of Emergency Situations and the State Statistics Committee ASSC 2009).*

## Conclusion

In Seki, floodings cause serious damage to the region, amounting to 4-5% (about 30 million manats) of GDP (gross domestic product) of the district. It is a very high ranking. Although there has been a significant reduction in flooding process with the implementation of the measures by the authorities, it is insufficient for territory. However, the damage may be reduced or minimized. The following suggestions may be considered for this purpose.

- Conducting of dams in rivers with high discharge cones.
- Deepening of the bed of the river (this should be done regularly).
- Awareness-raising activities among the population.
- Forecasting of floods and inundation that can be made by modern programs.

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