

Report number:

2025-03-22

# SAT Analysis report for Bibalan Rural District (Gilan Province) Flood

Farvardin 1404



Tehran Reinsurance  
Company

Report title	report for Bibalan Rural District(Gilan Province) Flood
Date of preparation	Farvardin 1404
Edit	1



## **Introducing the Satellite Image Analysis System (Tehran-SAT)**

Tehran Reinsurance company, with an innovative approach, offers a comprehensive solution based on satellite image analysis to the insurance industry. This approach is designed in response to the growing challenges posed by natural and meteorological hazards in Iran, and its goal is to empower insurance companies to manage potential risks and provide faster and more accurate services to policyholders. Considering the climatic diversity and the occurrence of numerous natural disasters in the country, the need for an efficient tool to predict and assess damages is increasingly felt.

Tehran Reinsurance's satellite(Tehran-SAT) analysis-based solution enables continuous and accurate monitoring of changes in the Geographical condition of Iran. This valuable information helps insurance companies identify early signs of natural hazards such as floods, land subsidence, and droughts and take the necessary preventive measures in a timely manner.

The benefits of this solution are not limited to prediction and prevention, but also create a fundamental transformation in the claims assessment process. Using satellite images, it is possible to measure the validity of natural disasters caused by precipitation, floods, subsidence, storms, droughts, cold and heat waves.

Finally, Tehran Reinsurance, by offering this innovative solution, has taken an important step towards improving the level of services in the Iranian insurance industry and helps insurance companies to manage their risks more confidently.

## Incident description

- Incident: Flood
- Cause: Rainfall and flooding
- Location: District Rural Bibalan - Gilan Province
- Incident Coordinate : 37.09°N, 50.3775°E
- Elevation: -24 meters
- Date of incident: 2nd and 3rd Farvardin 1404 (March 22–23, 2025).
- Damage: During the incident, two bridges were destroyed and access to approximately 200 villages in the Ashkourat and Rahimabad regions was blocked. Additionally, two local residents were reported missing.



Image 1: Flood incident site

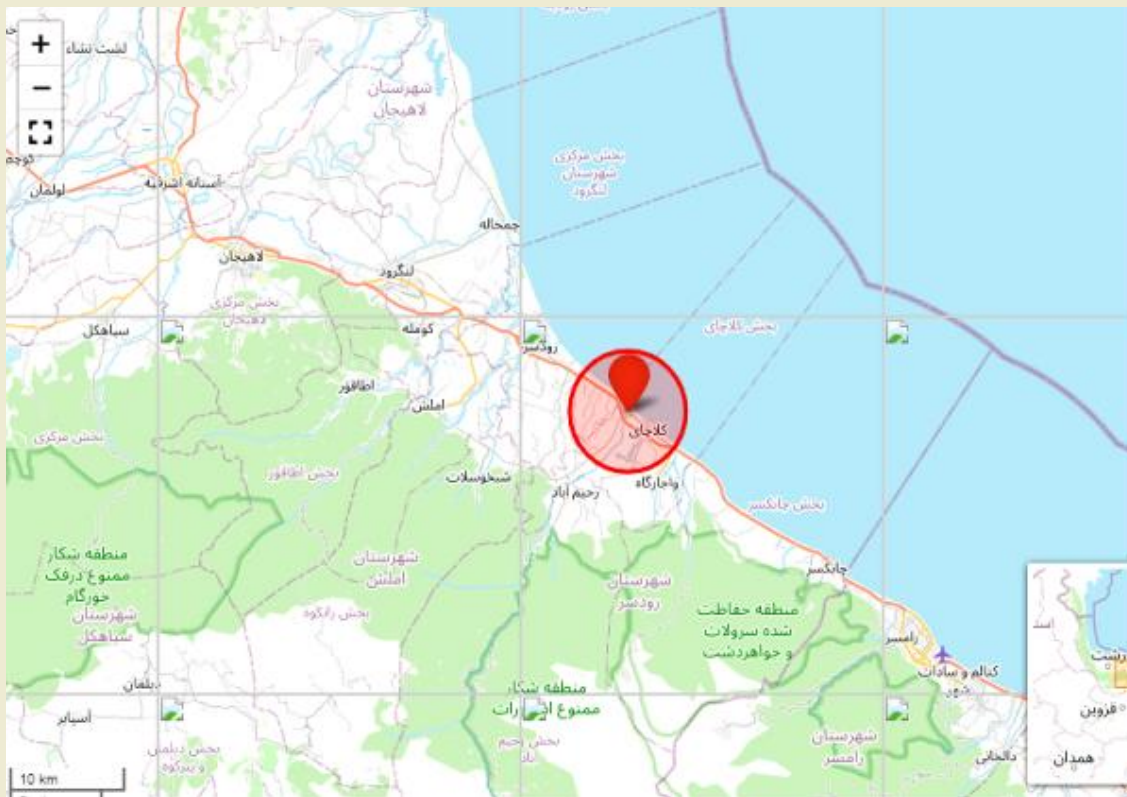


Image 2: Exact location of the flood



Image3 : Location of the *Incident*

**Analysis of Rainfall, Temperature, and River Discharge in Bibalan Rural District 1404 / March–April 2025):**

This report analyzes data related to rainfall, temperature, and river discharge during the period from March 15 to April 4, 2025 (25 Esfand 1403 to 16 Farvardin 1404). During this time, the Bibalan Rural District in Gilan Province experienced significant rainfall, which ultimately led to flooding on the 2nd and 3rd of Farvardin 1404 (March 22–23, 2025).

According to Table 1, the total recorded precipitation was 84.2 mm, which is considered substantial for such a short period. The maximum daily rainfall was reported as 17.4 mm, indicating intense and concentrated precipitation on certain days. In total, nine rainy days were recorded during this period, leading to soil saturation and reduced infiltration capacity.

A more detailed analysis of the data shows that the most severe rainfall occurred on the 1st and 3rd of Farvardin (March 21 and 23). These heavy rainfalls led to soil saturation, the overflow of water channels, and an increase in river levels. Given this pattern, the occurrence of flooding in the days that followed was highly predictable. With the use of early warning systems or real-time meteorological data analysis, it would have been possible to reduce damages through timely and preventive actions.

It is also noteworthy that on Bahman 28 (February 18), the temperature reached 20°C, indicating a gradual warming trend prior to the flood event. This increase in temperature likely led to early snowmelt in the highlands, which increased surface runoff and intensified flood conditions.

Furthermore, river discharge data from Farvardin 4 (March 24) shows that the discharge peaked at 119.2 cubic meters per second, the highest value recorded during the entire period. These figures reflect the flow status of the nearest river adjacent to the area, which was directly affected by heavy rainfall and snowmelt. This sudden increase in river discharge played a major role in the overflow and resulting flooding in the region.

These findings clearly indicate that the floods were foreseeable, and that with proper preparedness and accurate forecasting, the severity of the resulting damage could have been significantly reduced.



Daily Precipitation statistics

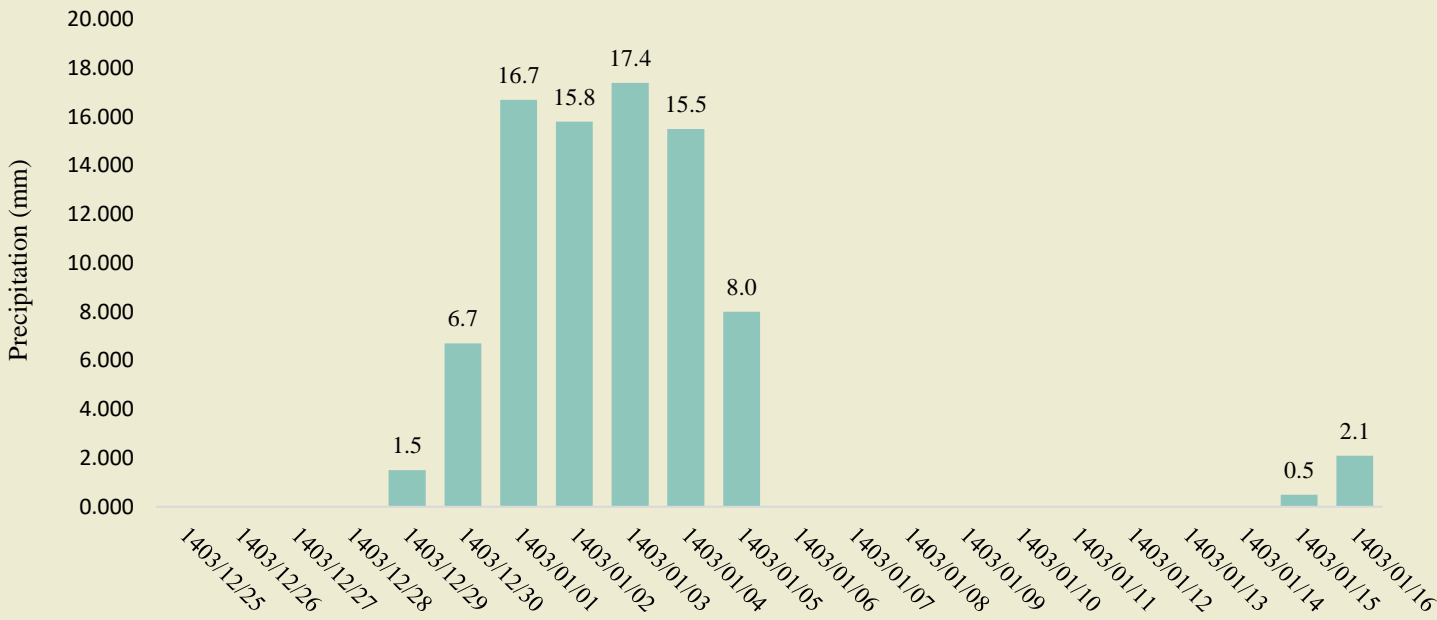


Chart 1: Precipitation Statistics

Metric	Value
Total Precipitation	84.2 mm
Maximum Daily Precipitation	17.4 mm
Days with Rain	9 days

Table1: Precipitation Statistics

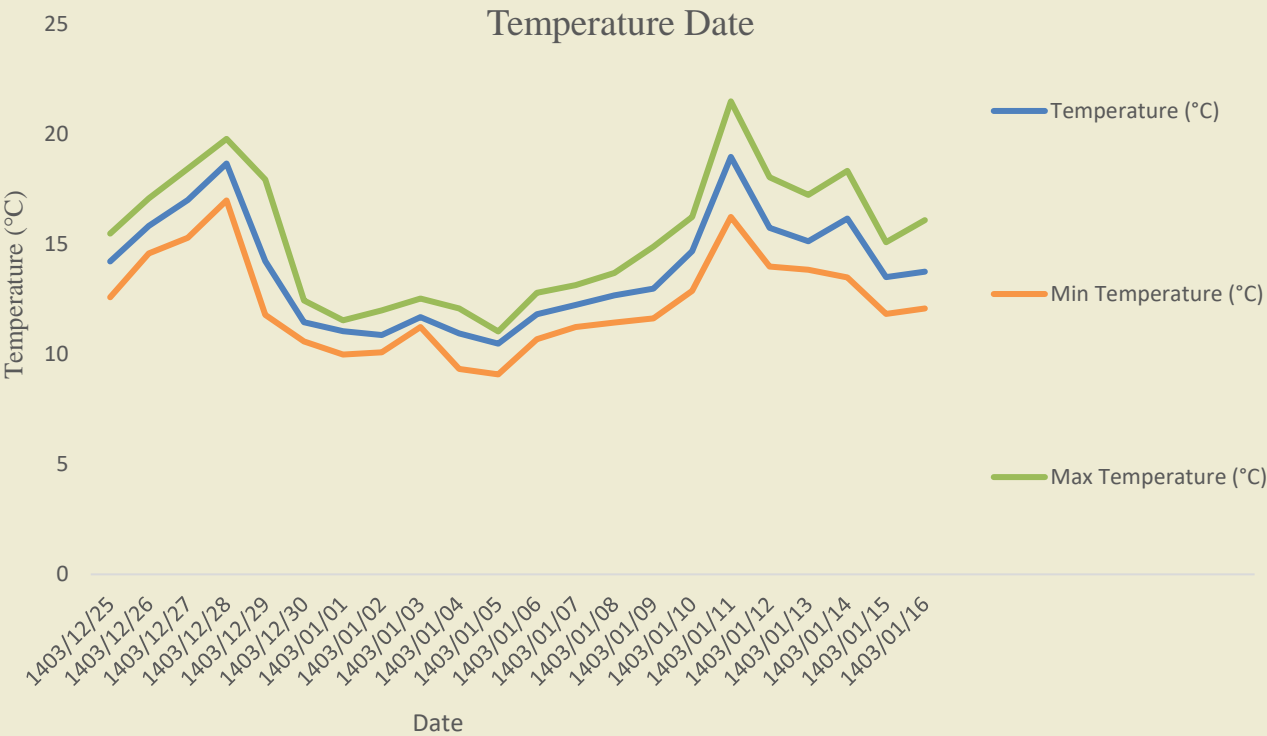


Chart 2: Temperature Statistics

Metric	Value
Average Temperature	13.8°C
Minimum Temperature	9.1°C
Maximum Temperature	21.5°C

Table2: Temperature Statistics



River Discharge Date

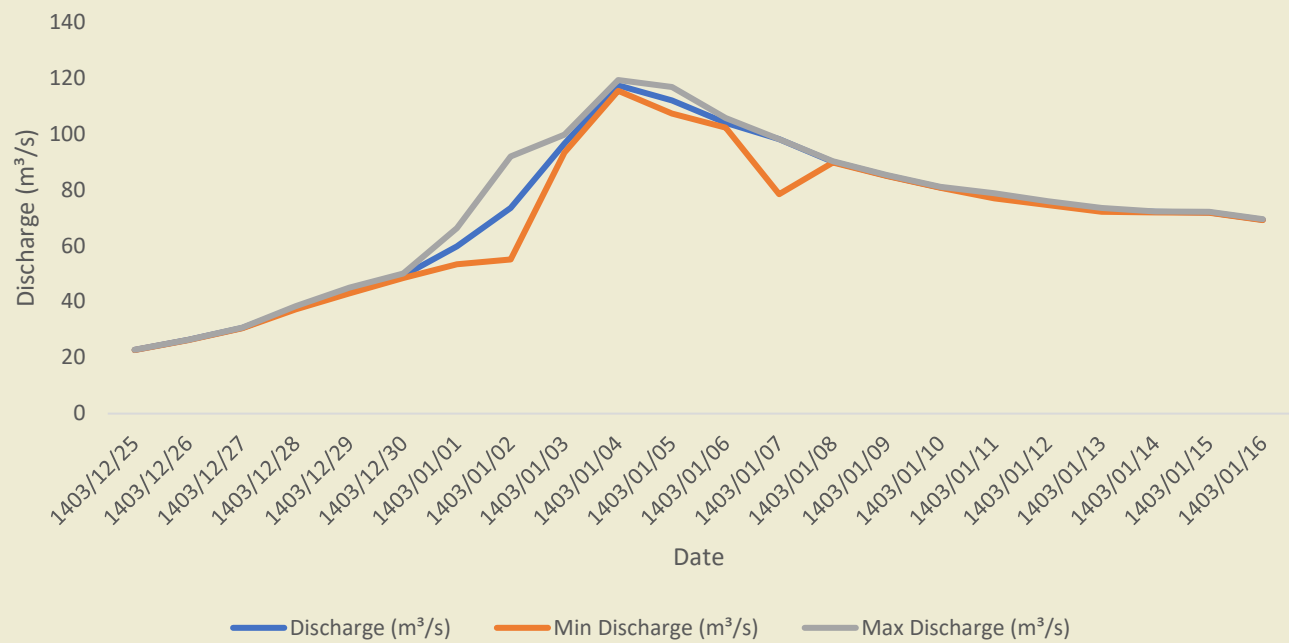


Chart 3: Discharge Statistics

Metric	Value
Average Discharge	71.2 m³/s
Minimum Discharge	22.8 m³/s
Maximum Discharge	119.2 m³/s

Table3: Discharge Statistics