



State Comptroller of Israel | Local Government Audit | 2021

Local Government Audit Division

**Local Authorities
Preparedness for Floods
and Flooding and their
Function during the
Winter of 2020**



Local Authorities Preparedness for Floods and Flooding and their Function during the Winter of 2020

Background

In recent years, the number of floods and flooding in Israel has increased because of raise in the frequency and intensity of exceptional rainfall events, along with a considerable expansion of the built-up and impermeable areas that impair the water's ability to seep into the ground. In the winter of 2020, there were several exceptional rainfall events across Israel that led to severe floods and flooding, mainly in the coastal cities. During these events, seven people lost their lives, property and infrastructures damages amounting to tens of millions of new shekels.

The local authority plays a vital role in the preparation of the civilian home front for exceptional weather events, especially to the care and assistance of the residents. Thus, it is very important that it will be prepared to deal with floods and flooding when they occur.



Key figures

7

People lost their lives in the events of winter 2020.

590

Cases of floods and flooding occurred in 2020 in which the National Fire and Rescue Authority of Israel was called to rescue residents.

250 mm. rainfall

Which are approximately 40% of the annual amount of precipitation, of rain falling in the Nahariya area from the 3rd to the 9th of January 2020.

10

Years have passed since the preparation of the flood defense plan for the city of Nahariya, but it has not yet been completed.

174

Inquiries were received at the Ashkelon Municipality's 106 hotline on December 8th and 9th, 2019, due to the flooding events in the city.

NIS 172 million

Total investments in the drainage infrastructure of the local authorities examined in the years 2016–2020.

NIS 55 million

Total canalization levies collected by the local authorities examined in the years 2016–2020.

NIS 69 million







Insurance estimated amount claim of the Nahariya Municipality for the flood damage in the winter of 2020.

Audit actions

- From March to October 2020, the State Comptroller Office examined aspects of preparedness for preventing floods and flooding and the drainage infrastructures in the municipalities of Ashkelon, Kfar Saba, Nahariya, and the Jisr a-Zarqa Local Council. Aspects of the functioning of the Ashkelon and Nahariya municipalities at the events of winter 2020 were also examined. Completion examinations were conducted at government ministries and other regulatory bodies. The audit was based, among other things, on the results of examinations conducted by an external expert consultant.





Key findings


-  **Regulating the Handling of Local Authorities' Preparedness for Floods** – The existing normative infrastructure does not have an entity authorized to enforce local authorities to issue guidelines regarding civilian emergency events. The preparedness of each local authority for these events depends on its desire and ability to comply with the instructions given to it. In addition, the division of responsibilities between the drainage authorities and the local authorities regarding the drainage infrastructure located in the municipal area has not been defined.
-  **Conservation and Maintenance of Drainage Systems** – Three of the four local authorities examined – Ashkelon, Nahariya and Jisr a-Zarqa - did not regularly maintain the drainage systems in their area and have not prepared a work plan for regular and systematic examination that will maintain the integrity of the system.
-  **Infrastructure Mapping and Formulating Drainage Master Plans** – The Nahariya Municipality and the Jisr a-Zarqa Local Council did not map their drainage systems and did not prepare drainage master plans; the municipalities of Ashkelon and Kfar Saba prepared a drainage master plan but only partially implemented it. These municipalities have mapped their drainage systems, but do not have information on the age of the systems.
-  **Preparedness of Drainage Infrastructures** – The drainage infrastructure of the local authorities examined, do not address the updated reference scenarios of expected rainfall amounts and flow rates. The planning of the defense plan for the city of Nahariya has not yet been completed.
-  **Canalization Levies** – In determining the canalization levy calculations, the Ministry of Interior did not directly take into account the degree of flood risk in the local authority; the Jisr a-Zarqa Local Council did not collect the canalization levies in accordance with the by-law it enacted; in 2016, the Nahariya Municipality used part of the canalization levy money for projects unrelated to the city's canalization. In the years 2016 to 2020, the investments of the four local authorities, examined, in the drainage infrastructure within their area amounted to approximately NIS 172 million, and in those years, they collected approximately NIS 55 million canalization levies.
-  **Ensuring Adequate Drainage Solutions in New Construction** – The municipalities of Ashkelon and Nahariya carried out construction that did not comply with the provisions of the NOP (National Outline Plan - a zoning and development statutory plan in a specific field on a national level in Israel) and the opinions of the relevant drainage authorities, therefore did not provide adequate drainage solutions. For example, in Ashkelon - in the



planning of the Ir Haya'in (Wine City) neighborhood, which is planned for 40,000 residents; and in Nahariya - the municipality did not remove barriers for pedestrians over the Ga'aton River despite requests from the Drainage Authority to do so.

 **Establishment of Internal Procedures and Drilling** – The municipalities of Ashkelon and Nahariya and the Jisr a-Zarqa Local Council have not established comprehensive procedures for preparedness and function in flood events; and they did not exercise their emergency arrays in preparation for such events.

 **Functioning of the Local Authorities in the Winter 2020 Events** – The municipalities of Ashkelon and Nahariya did not keep an event log to document the winter 2020 events; the Ashkelon Municipality did not document the activities of its operating center; the Nahariya Municipality's operating center was not prepared to deal with the flood event in January 2020, and the municipality's representatives who were there during the event moved their operation to the Nahariya Police Building; the Nahariya municipal hotline did not operate for several hours, and referrals to it were not documented in real time and were not handled.


 **Flood Forecasting** – The Center for Flood Forecast, established by the Israel Meteorological Service and the Israel Hydrological Service in October 2019, distributes forecasts of floods in streams, but does not make forecasts for floods and flooding in urban areas.



Municipal Runoff Management – The Kfar Saba Municipality has implemented innovative solutions for runoff management: it has established a bio-filter system for the treatment of municipal runoff; reservoirs for collecting rainwater and using it to water public gardens; and special drainage facilities for storing and discharging runoff water.

Lessons Learned – The Nahariya Municipality has conducted orderly processes of lessons learned from the events of winter 2020, established new internal procedures for preparing and dealing with floods and flooding, and has begun to implement them.

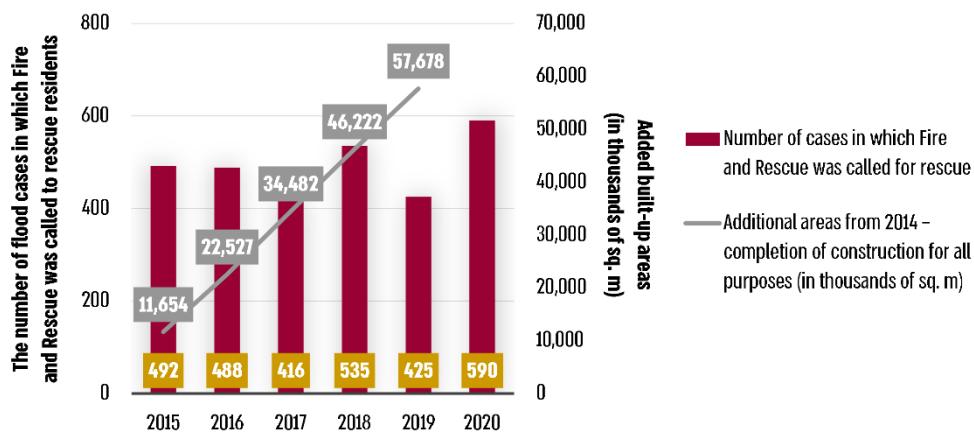
Key recommendations

 The issue of local authorities' preparedness for civilian emergency events, including floods and flooding caused by extreme rainfall events, must be urgently regulated. It is recommended that the Ministry of Interior act to regulate the issue and determine a state body that will integrate all the requirements and guidelines that local authorities must fulfill, regarding the said events, and will oversee their implementation.



- 💡 Local authorities should prepare updated master plans for drainage, in consultation with the drainage authorities; map the drainage infrastructure within their area including the age, length and diameter of the drainage lines, and update the GIS systems accordingly; inspect the drainage infrastructure, upgrade and maintain it properly; and cooperate with the drainage authorities, to adapt them to the reference scenarios adapted to the growth of the population and the built-up areas.
- 💡 Local authorities must include adequate drainage solutions in new building projects. It is recommended that the local authorities act in accordance with the opinion of the drainage authorities and the drainage appendices of the plans applicable to the area.
- 💡 Local authorities should establish internal procedures for preparing and dealing with exceptional weather events and include all necessary aspects in them. This, given their unique characteristics and their degree of risk of floods.
- 💡 It is recommended that local authorities exercise their emergency systems in preparation for flood and flooding events, combined with other emergency bodies, and draw lessons from exceptional weather events that have already occurred.

The Increase in Built-Up Areas and the Number of Rescue Cases due to Flooding



According to the data of Fire and Rescue and Central Bureau of Statistics, processed by the State Comptroller Office



A vehicle Sinks in Flooding in the Sprinzak Neighborhood in Nahariya, 8.1.20



Courtesy of the A. family of Nahariya.

Summary

The audit findings indicate that the local authorities which were examined, were not properly prepared for floods and flooding in the winter of 2020, and are not sufficiently prepared for such and even more severe events in the near future due to rising rainfall intensities and considerable expansion of built-up areas. The preparations of local authorities for civilian emergency events has not been regulated, and municipal drainage infrastructures are old and not adapted to the updated reference scenarios of rainfall amounts and expected flow rates. Some of the local authorities, examined, did not sufficiently prepare for the winter season; did not exercise their emergency arrays for floods and flooding; and their procedures lacked important aspects for flood and flooding events.

These findings indicate the need to establish a state body that will integrate all the requirements and guidelines that local authorities must meet regarding civilian emergency events, including floods and flooding, and will oversee their fulfilment. It is recommended that local authorities draw the necessary lessons from previous incidents and act resolutely, in coordination with drainage authorities and other relevant parties and in a clear division of responsibilities between them, to reduce the number of flooding incidents in their jurisdiction, improve their preparedness, and deal quickly and efficiently with these events as they occur.