

Al Zohour Green Triangle

Pilot Project

Strengthening the Social Stability and Resilience of Vulnerable Jordanian Communities and Syrian Refugees in Amman against Flash Floods Project

PROJECT BRIEF

Background

Flash floods have become a serious problem in Jordan due to rapid unplanned urbanization, the insufficient capacity of drainage systems, and climate change ramifications. In 2018, flash floods resulted in the loss of lives and in damages to private properties and urban infrastructure, especially in Amman. In response to the significant risk of flash floods in Amman, UN-Habitat Jordan has implemented the project “Strengthening the Social Stability and Resilience of Vulnerable Jordanian Communities and Syrian Refugees in Amman against Flash Floods”. The project, funded by the Government of Japan with a total budget of \$978,000 and implemented in close collaboration with the Greater Amman Municipality (GAM), aimed to strengthen government and community’s resilience and capacities to better manage flash floods. This was done through community consultations, awareness raising campaigns, training, and capacity building on flash flood resilience, as well as through piloting flood mitigation measures that can be replicated in different areas using sustainable stormwater drainage systems and green infrastructure approaches.

As part of the project, UN-Habitat conducted a “Flood Risk Assessment and Flood Hazard Mapping” study of Downtown Amman, which identified flood hotspots within the city and proposed short, medium, and long-term solutions and interventions to mitigate the flood risk in Downtown Amman. The short-term solutions included the introduction of a series of stormwater retention and detention elements around the upstream areas of the city. Such elements would detain the fast-approaching flood water for some time before it drains down slowly, giving the drainage system in the downtown area enough time to pass the water through without causing harm or damage. This is called green stormwater infrastructure and is what the Al Zohour Green Triangle aims to demonstrate.

Location Selection

The Al Zohour Green Triangle was identified as one of the 120 locations for the implementation of short- and medium-term green stormwater infrastructure interventions. At the intersection of Al Quds Street and Bab Al Khalil Street within the Al Zohour District of Amman, this location sees large amounts of stormwater runoff passing through from its 8 km² watershed into Downtown Amman. This site was selected using the following criteria:

1. There is enough storm water flowing through the site to fill the selected intervention.
2. The land had to be owned by GAM and without any plans for future use.
3. The land had to be within intersections or circles.
4. Developing the site would not impact neighboring land use.

Al Zohour Green Triangle

The Al Zohour Green Triangle is a pilot project that aims to demonstrate two concepts of green stormwater management; stormwater bioretention and stormwater detention. The former concept is demonstrated through a series of bioretention and bioswale areas designed to allow water to infiltrate into the ground and to be absorbed by the vegetation cover. The latter concept is demonstrated through a concrete underground tank for stormwater detention. The Al Zohour Green Triangle has an area of **2300m²**.

MAIN FUNCTIONS

Water Inlets



The project has two stormwater inlets. The first inlet is for the bioretention system and is a 150mm pipe that is connected to the stormwater network coming down from Bab Al Khalil Street. The second inlet is for the underground concrete tank and is a 250mm pipe that is connected to the stormwater network coming down from Al Quds Street.

Water Retention Function



Retention occurs when flood water is completely removed from the stormwater drainage system. The bioretention and bioswale areas have a capacity of approximately 750 m³ and are designed to encourage infiltration into the ground and absorption by the vegetation cover.

Water Detention Function



Detention occurs when flood water is detained for a certain period and then slowly released to the stormwater drainage system. The underground concrete tank has a capacity of approximately 2,100 m³ and will detain the incoming flood water before allowing it to slowly drain later on.

Water Reuse Function



As an added bonus, the main underground detention tank is equipped with a pump to send out the water for reuse outside the project through water tankers or for agricultural irrigation on site during the summer.

Water Outlets



The bioretention areas have a drain at their lowest elevations for draining the excess water. The drainage structure connects the water back to the stormwater network downstream in Al Quds Street. Additionally, the underground tank is connected to an overflow water outlet that is always open and a drain to completely empty the tank between storms when there is no time to reuse the water so that the tank is ready for upcoming storms.

Landscape



The landscape of the Al Zohour Triangle has been designed to integrate all parts of the project together into an aesthetically-pleasing green infrastructure initiative. The landscape additionally helps with water absorption and creates a green window that is much welcome in Amman, given the arid nature of the surrounding areas.

The total implementation cost of the project was \$465,000.

CONSTRUCTION PHASES

Before implementation



During implementation



After implementation



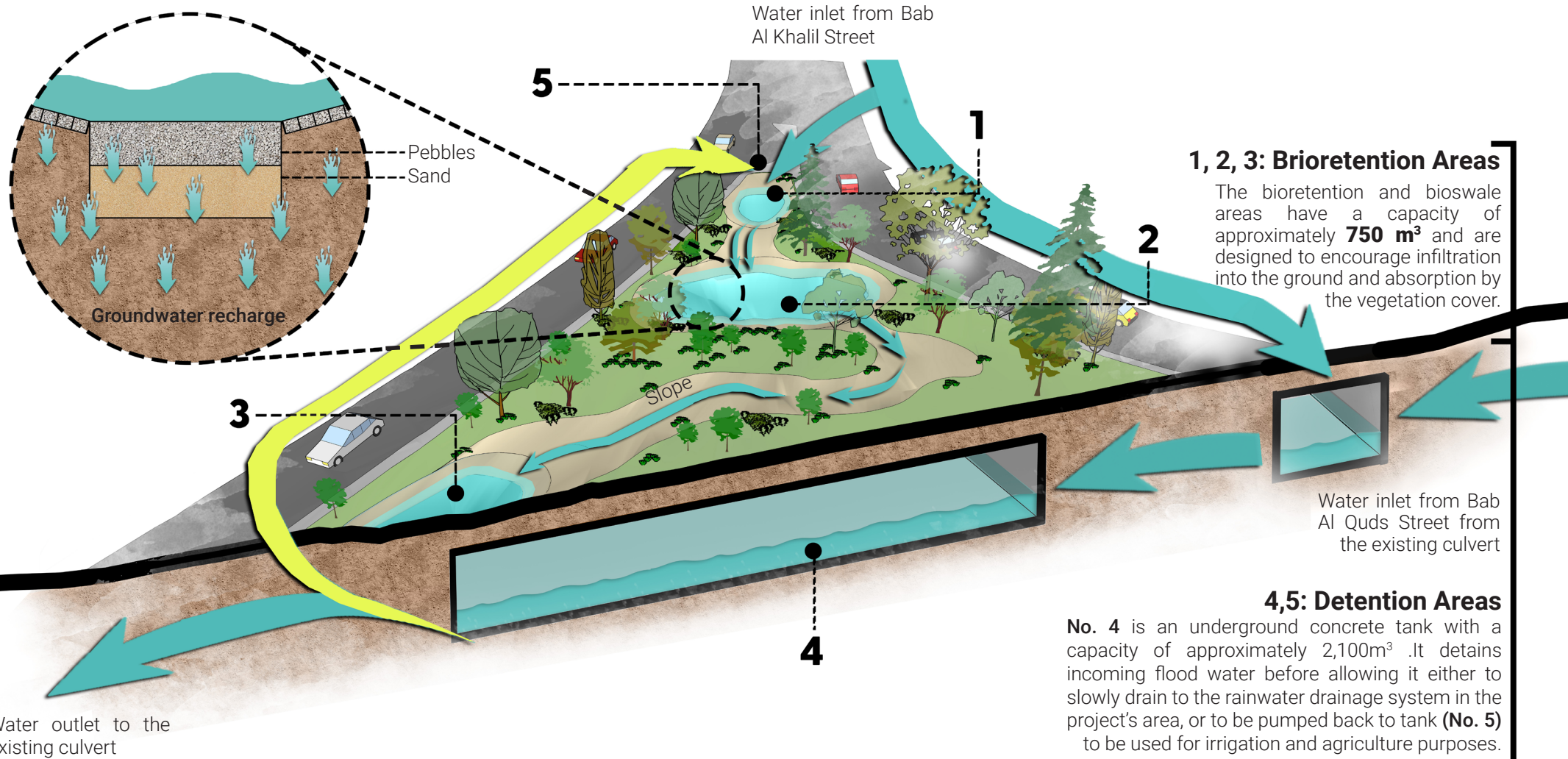
RENDERED IMAGE



RENDERED IMAGE



PROJECT DIAGRAM



UNHABITAT

FOR A BETTER URBAN FUTURE

Email: unhabitat-jordan@un.org

Website: www.unhabitat.org

  @UNHabitatJORDAN

Project location

