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# Urban Green Infrastructure as Entry Points to Enhance the Resilience and Wellbeing of Vulnerable Communities in Jordan

**Deema Abu Thiab,**  
UN-Habitat Jordan

**12th Regional Sustainable Cities Conference**  
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# OUR MISSION

UN-Habitat promotes transformative change in cities and human settlements through knowledge, policy advice, technical assistance, and collaborative action to leave no one and no place behind.

UN-Habitat is one of the leading organisations working to achieve the SDG targets and plays a particularly crucial role in ensuring that Goal 11 is addressed globally through all the Goals.

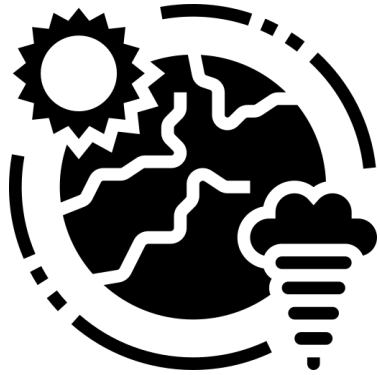
SGD 11.7: By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, particularly for women and children, older persons and persons with disabilities



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# URBAN CHALLENGES



**Climate Change**



**Flashfloods**



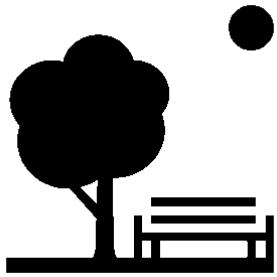
**Water Scarcity**



**Food Insecurity**

# UN-HABITAT'S RESPONSE

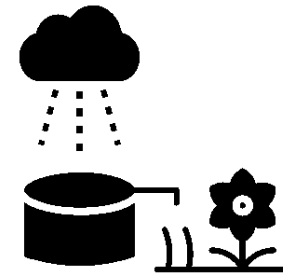
We have been implementing green infrastructure to enhance the resilience and wellbeing of vulnerable communities in Jordan.



**Green public space projects** as avenues for social cohesion, economic opportunities, and improving mental health.



**Vocational Training on Nature Based Solutions** and sustainable agriculture methods, such as implementing wicking beds and community gardening to improve food security and provide livelihood opportunities.



**Rainwater Harvesting and Sustainable Urban Drainage Systems (SUDS)** to strengthen the resilience of vulnerable communities and shelters against flash floods and to provide fundamental ecological solutions to climate change.



# COMMUNITY ENGAGEMENT TOOLS



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City Resilience Action Planning (CityRAP)



Public Space Site-Specific Assessment



Block-by-Block (Minecraft)



Validation Workshops



Co-Design Toolkits



Capacity Building & Vocational Training



Participatory Piloting



Surveying (KoboCollect)

# Strengthening The Social Stability and Resilience of Vulnerable Jordanian Communities and Syrian Refugees in Amman Against Flash Floods



To strengthen government and community resilience and capacities to better manage flash by providing a comprehensive and integrated response against flash floods through community consultations, awareness raising, training and capacity building and the implementation of flood resilient infrastructure.



Budget:  
\$978,000



Donor:  
Japan Supplementary Budget FY2019



Duration:  
April 2020- November 2022



Flood Risk Assessment and  
Flood Hazard Mapping of  
Downtown Amman Study



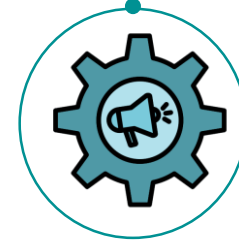
City Resilience  
Action Planning Tool



Green  
Infrastructure  
Pilot Projects



Capacity Building of  
Local Communities  
and Officials

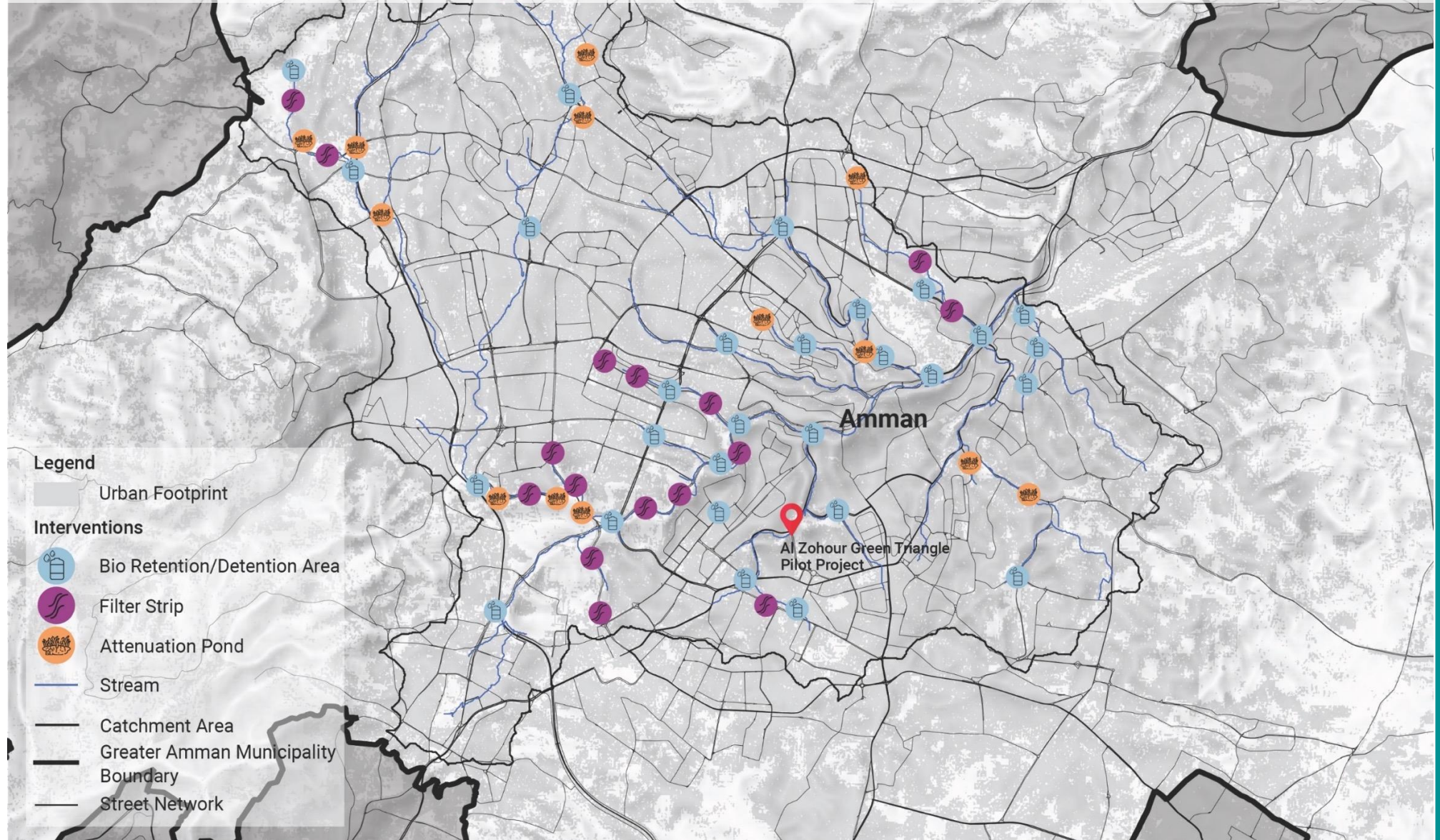


Awareness Raising  
Campaigns

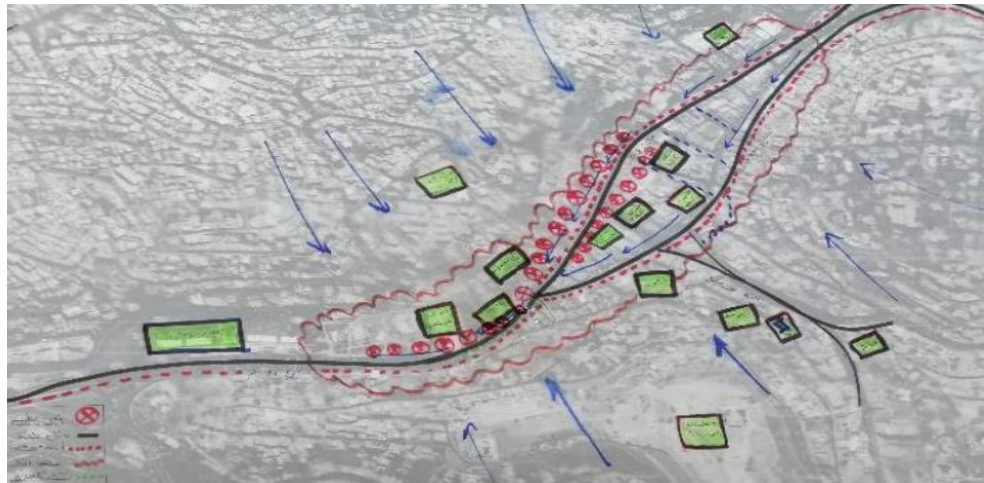


First Flood  
Risk  
Assessment  
and Flood  
Hazard  
Mapping Of  
Downtown  
Amman  
Study

## IDENTIFICATION OF 120 LOCATIONS FOR FLOOD MITIGATION MEASURES



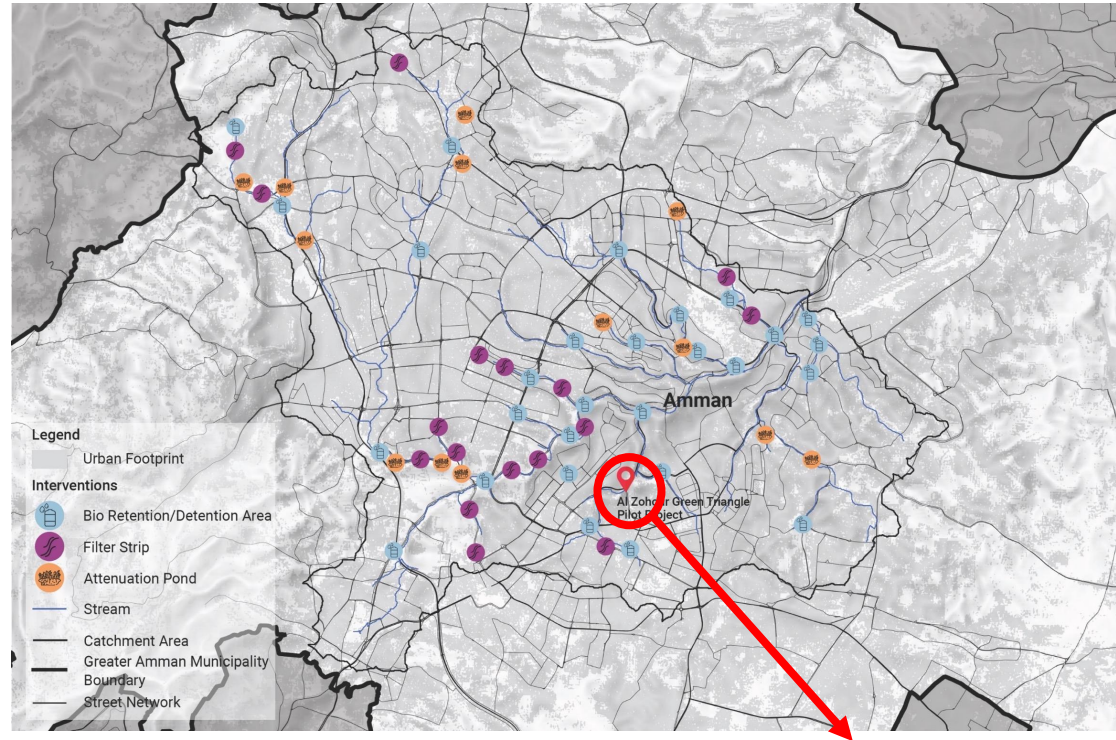
# City Resilience Action Planning Tool: Water Harvesting and Green Pockets Initiative





# Al Zohour Green Triangle

- At one of the 120 locations identified.
- This location sees large amounts of stormwater runoff passing through from its 8 km<sup>2</sup> watershed into Downtown Amman.
- It is based the concept of Sustainable Urban Drainage Systems (SUDS) and aims to demonstrate two concepts of green stormwater management:
  - Stormwater bioretention: to allow water to infiltrate into the ground and be absorbed by vegetation cover.
  - Stormwater detention: concrete underground tanks.

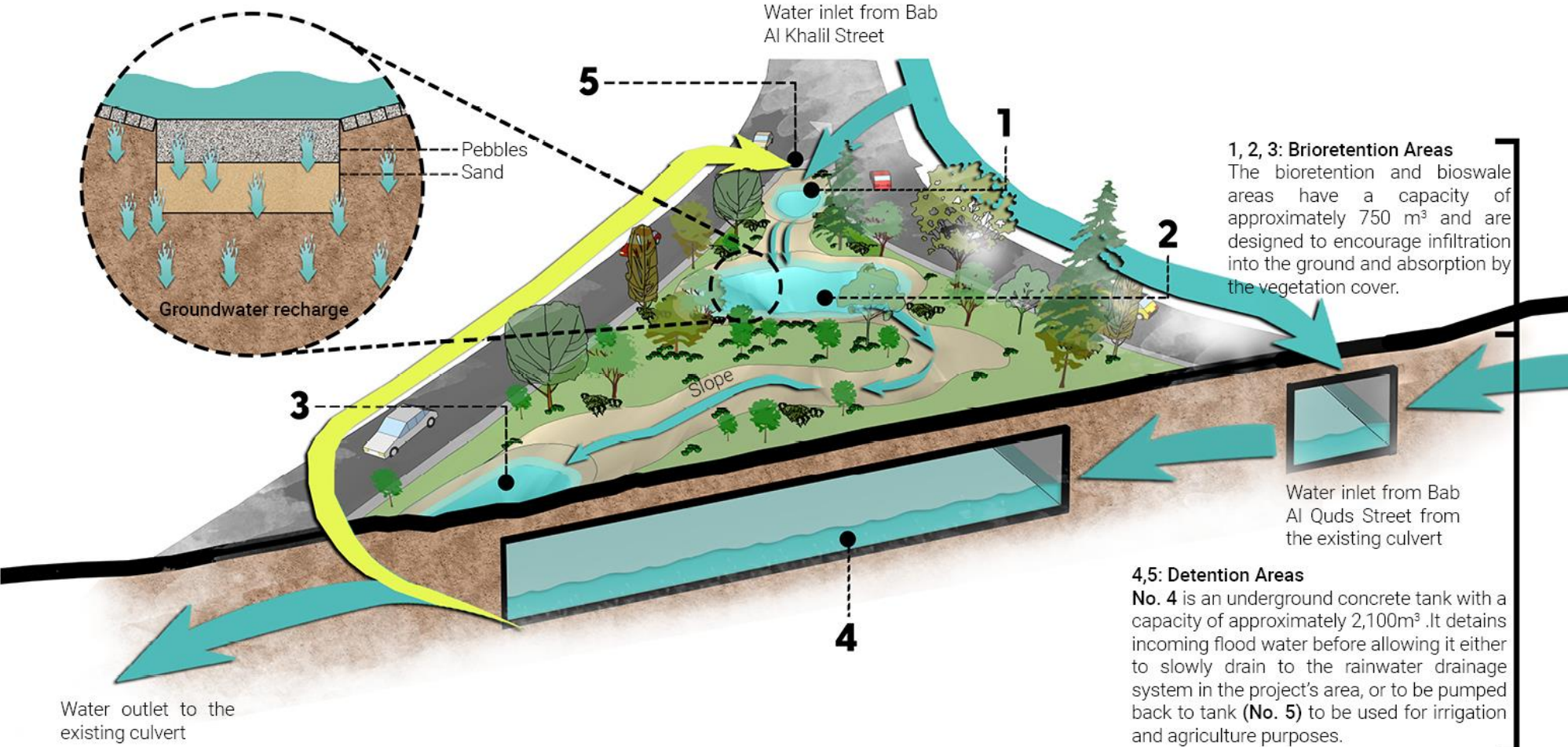


“This is a unique project that is being implemented in Amman for the first time. We look forward to it being a catalyst for hundreds of project as well as for larger strategic solutions in the near future. Thank you to UN-Habitat.”



H.E. Dr. Yousef Al-Shawarbeh, Mayor of Amman at the inauguration of the Al Zohour Green Triangle.

# Al-Zohour Green Triangle Pilot Project



# Al-Zohour Green Triangle Project

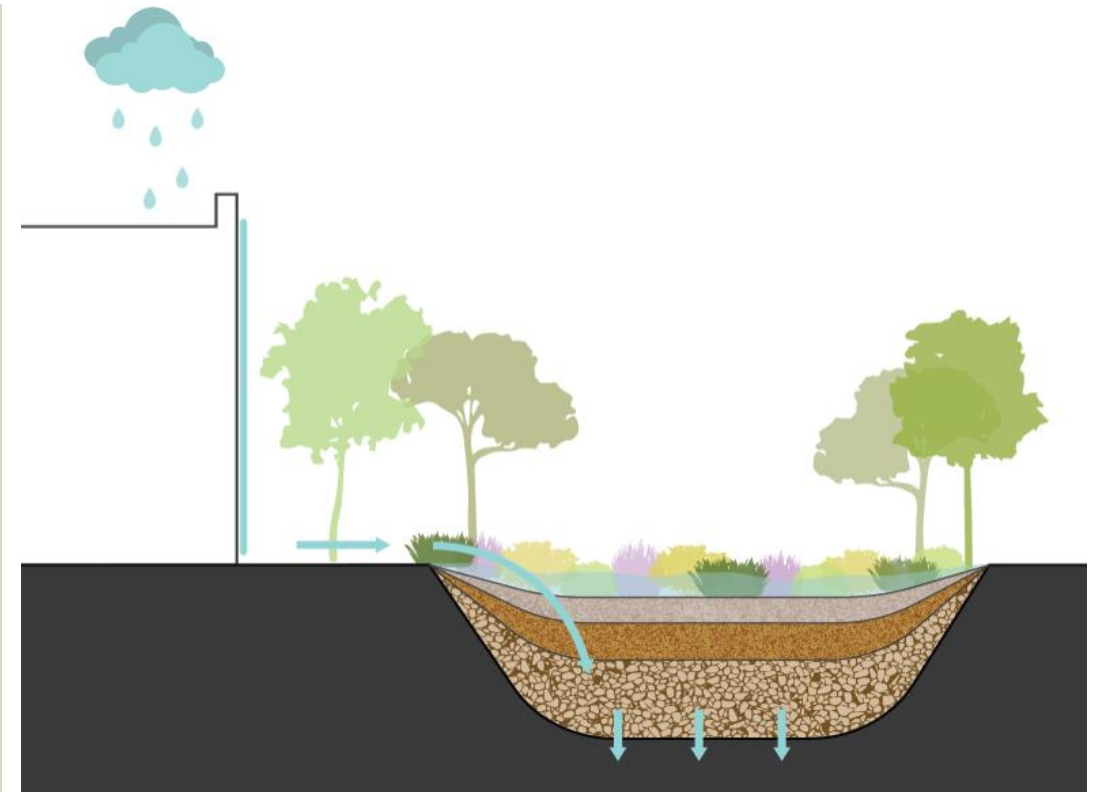


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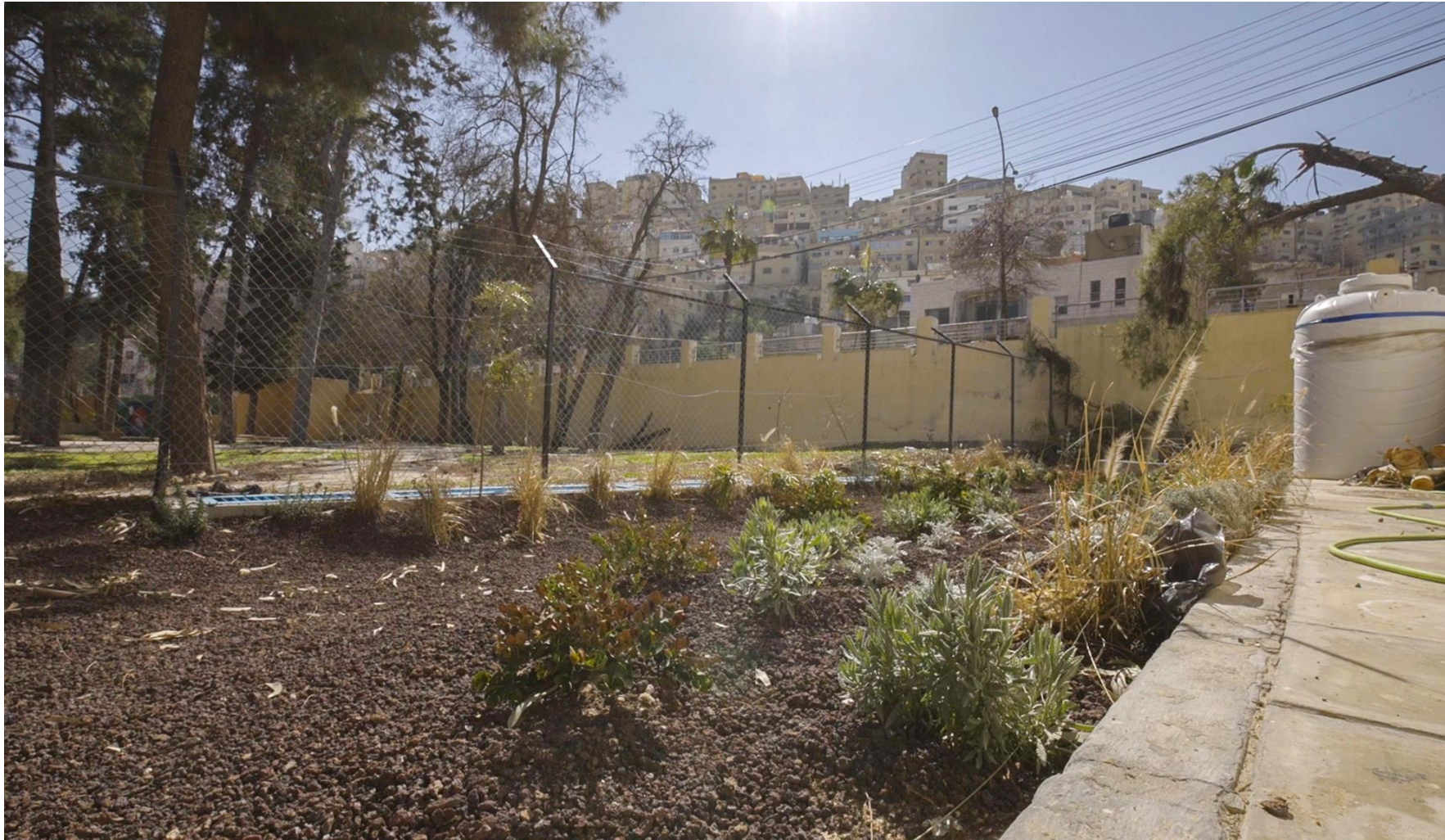


## For Households: Rain Gardens in Ras Al Ain Housing

A rainwater garden consists of native shrubs, perennials, and flowers planted in a small depression, which is generally formed on a natural slope. It is designed to temporarily hold and soak in rainwater runoff that flows from roofs, driveways, patios or lawns.



## For Households: Rain Gardens in Ras Al Ain Housing



# Vocational Training on Permaculture and Home-based Sustainable Agriculture for Resilience Against Flash Floods

- This 5-day training taught communities in Amman to exploit, collect, and use rainwater for agricultural purposes, provide water for domestic uses, and assist in minimizing the impact of flash floods on the drainage system.
- The participants implemented wicking beds at their homes, a school, and a farm to mitigate the flash floods risks and enhance their social responsibility.
- Provided educational and livelihood opportunities, while improving food security, thus decreasing COVID-19's socioeconomic consequences, and fostering social cohesion.



# Community Awareness Campaigns

To sustain the efforts of this project beyond the population in Amman and expected timeline, UN-Habitat conducted awareness campaigns, including posters, billboards, television, radio, as well as social media campaigns on Facebook and WhatsApp



Awareness Video Link: <https://fb.watch/bVeQryJZAH/>



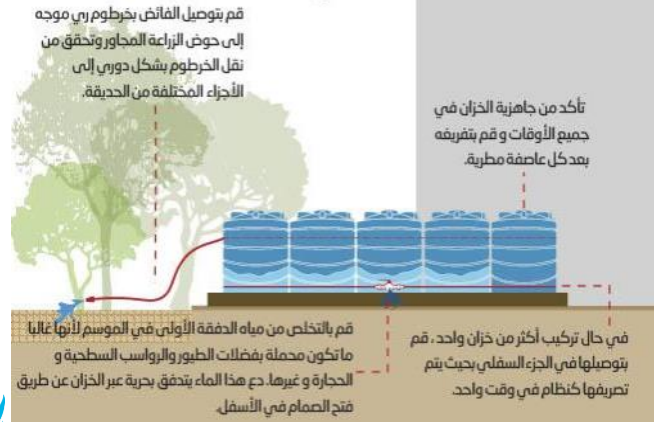
# Community Awareness: Water Harvesting System Installation Manual

## فوائد نظام الحصاد المائي:



حافظ على نظافة السقف والمزاريب من أي أوراق أو أعصان أو أوساخ أو فضلات أخرى.

## نصائح عامة:



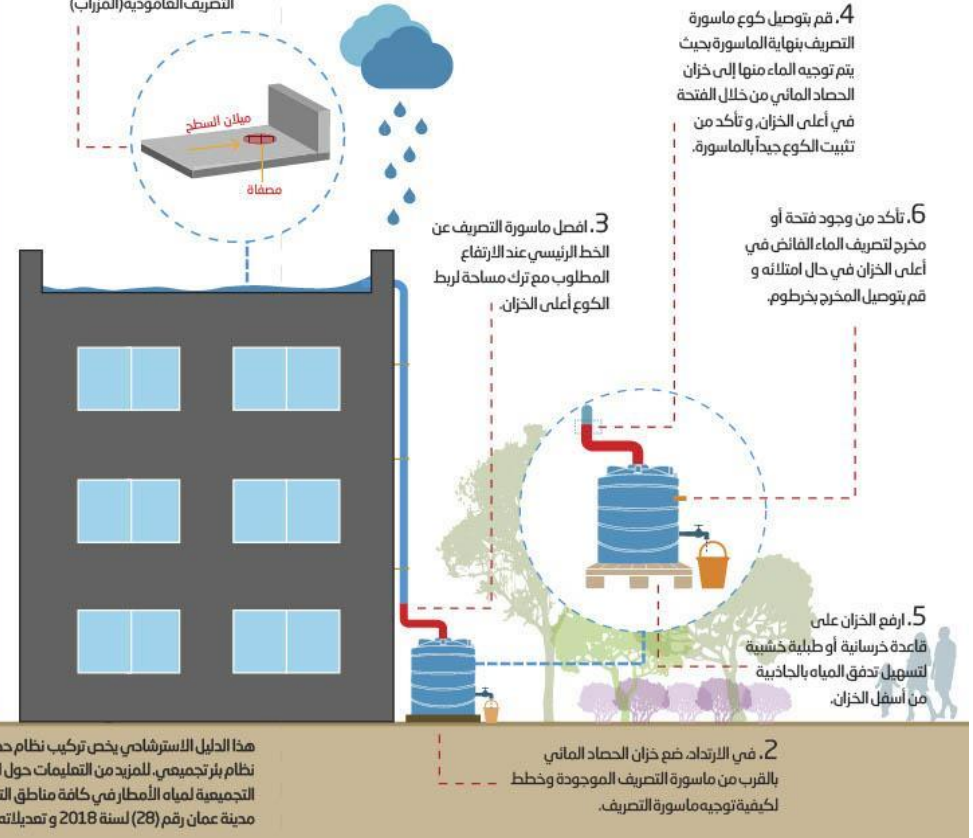
## لحساب حجم الخزان الأمثل:

$$\begin{aligned} & \text{مساحة سطح التجميع (متر مربع)} \\ & \times \\ & \text{100 مم (كثافة الهطول المطري في 24 ساعة)} \\ & \times \\ & \text{0.0008 (معامل الجريان بحسب الكودة الموحدة للمياه والصرف الصحي الاردنية).} \\ & \% \\ & = \\ & \text{حجم التخزين المطلوب (متر مكعب)} \end{aligned}$$

هذا الدليل الاسترشادي يخص تركيب نظام حصاد مائي منزلي بهدف التخفيف من أثر الفيضانات المفاجئة وليس نظام بتر تجمعي. للمزيد من التعليمات حول الآبار التجمعية، يرجى مراجعة أمانة عمان الكبرى وتعليمات الآبار التجمعية لمياه الأمطار في كافة مناطق التنظيم الصادر بموجب المادة (49) من نظام الأبنية والتنظيم في مدينة عمان رقم (28) لسنة 2018 وتحميلاته.

## خطوات تركيب نظام حصاد مياه أمطار منزلي:

1. تأكد من فاعلية صبة الميلان على سطح التجميع و تأكد من وجود مصافي عند نقاط التصريف المربوطة بماسورة التصريف العامودية (المزاريب)





# Inclusive, Safe, Resilient, and Sustainable Development in Urban Areas Hosting Syrian Refugees in Jordan and Turkey



## PROJECT OBJECTIVE

Under the scope of this project, UN-Habitat will be implementing a community-based urban garden in Amman, which will combine climate change mitigation, food security, and public space issues.



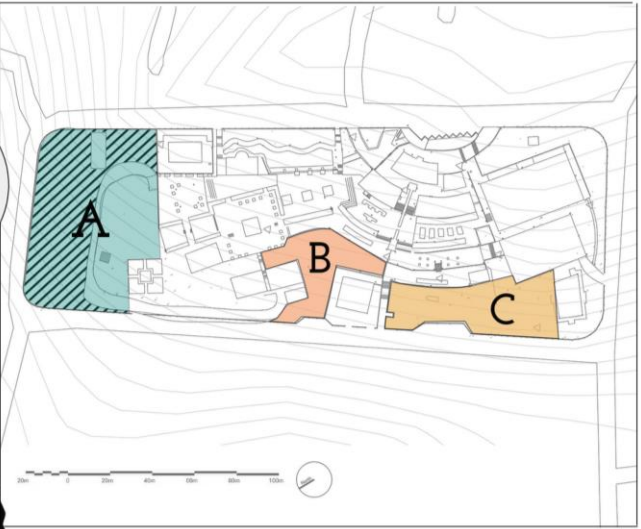
“I thank UN-Habitat for giving me this opportunity to learn and benefit. I hope that in the future I can develop these skills to gain employment that will benefit me, my daughters, my family, and my self-sufficiency. ”

**Rabah, a female Syrian refugee participant at the community garden training**

Inclusive, Safe, Resilient and Sustainable Development in Urban Areas Hosting Syrian Refugees in Jordan and Turkey

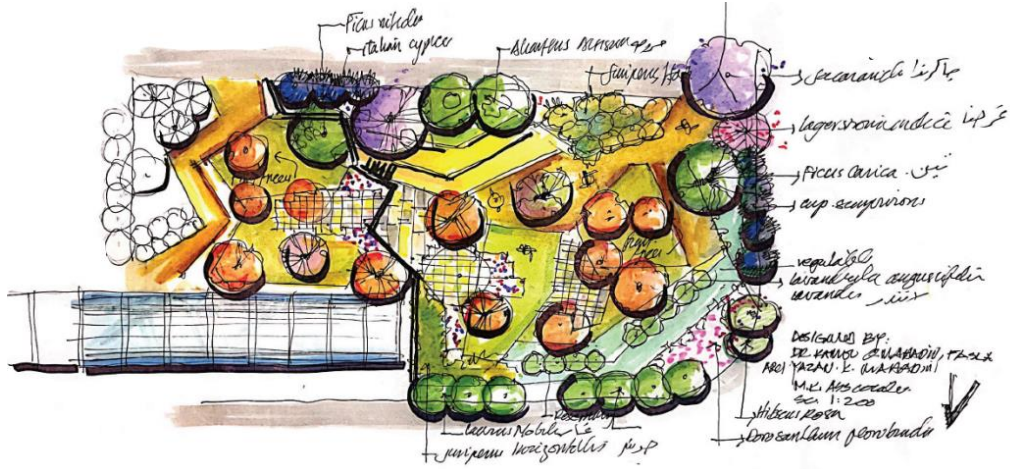
# Community-based urban gardening at Queen Rania Park – Site Analysis:

- 1 "Water harvesting from the rooftops and reusing grey and black water for agricultural purposes"
- 2 "Reuse the paved areas"
- 3 "Reuse marginalized and dead areas for raised beds and naturally grown plants"
- 4 "Some composting types need to be in unreachable and private areas and far from existing trees"



Criteria	Agricultural Requirements			Site Features				Final Score
	Sunlight	Wind	Possibility of Water Harvesting	Visual Perception	Access	Visitor Density Around the Site	Area	
<b>Zone A</b>	 Exposed ✓✓✓	 Exposed ✓	 High Potential ✓✓✓	 Partially observed ✓✓	 Accessible ✓✓✓	 The highest ✓✓✓	 4663 m2 ✓✓✓	<b>17</b>
<b>Zone B</b>	 Mostly Shaded ✓	 Protected ✓✓✓	 Low Potential ✓	 Partially Observed ✓✓	 Somewhat Accessible ✓✓	 Intermediate ✓✓	 1124 m2 ✓	<b>12</b>
<b>Zone C</b>	 Mostly Exposed ✓✓	 Somewhat Protected ✓✓	 The Highest Potential ✓✓✓	 Partially Observed ✓✓	 Hardly Accessible ✓	 Low ✓	 1606 m2 ✓✓	<b>13</b>

# Community-based urban gardening at Queen Rania Park - Design



POND



RAISED BEDS



POND & RAISED BEDS



RAISED BEDS

# LESSONS LEARNED

Three main factors that must be taken into consideration:



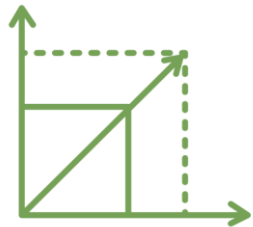
## **OWNERSHIP AND SUPPORT BY COMMUNITY AND LOCAL AUTHORITIES**

There has been a high acceptance for the participatory approach and even high interest in more engaging activities between the local communities and the officials, which helps build the trust between different stakeholders and the support for future collaborations.



## **ASSESSING THE SUITABILITY, APPLICABILITY, AND FEASIBILITY**

Not every form of green infrastructure will work within the context. We need to think about the challenge we want to address and the impact we would like.



## **REPLICABILITY & SCALABILITY OF THE APPROACH (NBSs)**

For example, 120 locations were selected for flood mitigation measures. UN-Habitat piloted Al-Zohour Green Triangle, UNDP chose another location to pilot another intervention based on the Flash Flood Risk Assessment and Hazard Mapping Study.

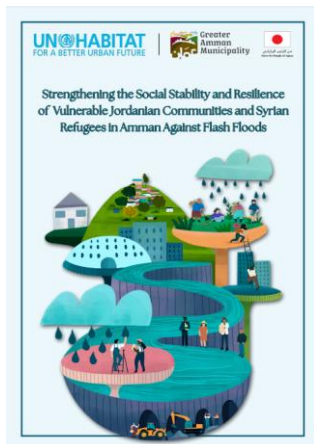


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# KNOWLEDGE PRODUCTS



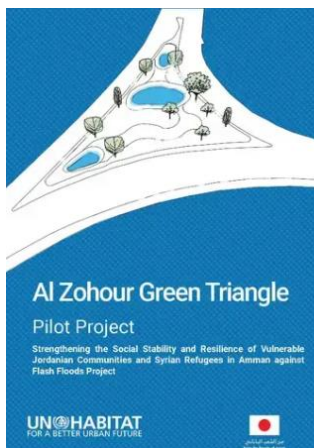
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**Flash Flood Project - Strengthening the Social Stability and Resilience of Vulnerable Jordanian Communities and Syrian Refugees in Amman Against Flash Floods- Brief**



**Enhancing the Safety and Resilience of Palestinian Refugees Through Improving Access to Water and Sanitation Facilities in Public Spaces of Souf and Al Shahid Camps**



**Al Zohour Green Triangle Factsheet**



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



**“Inclusive, safe, resilient and sustainable development in urban areas hosting Syrian refugees in Jordan and Turkey” Vocational Training**



<https://www.facebook.com/UNHabitatJORDAN/>

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

مشروع تعزيز الاستقرار الاجتماعي وزيادة منعة المجتمعات الأكثر تأثراً من  
الأردنيين واللاجئين السوريين ضد الفيضانات المفاجئة في عمان



من الشعب الياباني  
From the People of Japan



# Thank You!

