



Fig. 1 AMMAN

AMMAN JORDAN

2022 Exploring Urban Resilience Pathways



Author: Rima Alsammaræ

About the Report and Collection

This report is part of a collection wishing to provide a global overview about different cities' experience in resilience, and how this is evolving. The series is titled "Exploring Urban Resilience Pathways" and each report is prepared by one student of the Int. MSc. in City Resilience Design and Management (URNet-UIC Barcelona). During the first semester, students develop these reports as a learning outcome for their acquired analytical skills: to find, understand, organize and communicate critically different perspectives, approaches and models of urban resilience implementation, in a chosen city.

The aim of each report is thus to offer an easy-to-read overview about how adaptive capacities have been evolving in a selected city. The reports explore the past and current mechanisms through which each city responded to overlapping shocks and stresses. Nowadays current City Resilience Strategies – launched and supported by the Rockefeller 100RC program – are included within these analyses, representing the ultimate trend of understanding and implementing city resilience. Finally, current COVID19 pandemic responses are the final lens through which resilience mechanisms are discussed, to understand the alignment of resilience with other key urban goals, and ultimately respect to urban living.

What is interesting to learn from this series of reports, is that each of them critically discusses how cities managed adaptive responses to different treats, and how the concept of resilience evolved. Although the scope of these reports is ambitious and the analysis could result complex, the presentation has been designed to be easy to read and accessible to the general public. Each report of this collection maintains a standard structure, facilitating the reading and the reports (and cities) comparison.

Hope this initiative contributes to spread the understanding about how resilience has been framed and implemented in many cities across the globe.

Lorenzo Chelleri, Ph.D.

Director of the International Msc. in City Resilience Design and Management

AMMAN JORDAN

2022 Exploring Urban Resilience Pathways

Amman, the capital of Jordan, is situated on the East Bank Plateau, an upland characterised by three main wadis (valleys) that run through it. The city is known for being built on seven hills, or *jabals* in Arabic, and each hill is marked by a traffic roundabout that denotes a different area of the city. There are 22 districts in total. With each *jabal* comes a *wadi*, or valley, which contributes to the city's unique condition of microclimates (while one part of the city witnesses snow, another may witness heavy rainfall).

Amman's main urban challenges can be summed up as such: a lack of natural resources (particularly water and energy), recurrent influxes of refugee populations, and a weak economy. These challenges are heavily interdependent, worsening one another as they reach new peaks.

Amman's resilience strategy, released in 2017, addresses the many issues that have plagued the city's development and growth for decades. In addition to the shocks and stresses mentioned above, the strategy also tackles mobility, accessibility, integration and connectivity.

Since the creation of the city's resilience strategy, many of the plans that have been released address sustainability, with very few tackling other areas in need of improvement, such as community resilience. And while the research emerging from the city is comprehensive and dense, there is little to no actual implementation, which leads to questions about the use of resilience in the city as a guiding principle or an actual tool to increase the city's coping capacities.



Fig. 2 View of Amman from a valley

TABLE OF CONTENTS		
	About the report and the collection	2
	Summary	3-4
	Table of contents	5
	List of abbreviations	6
01\	INTRO AMMAN City Introduction Amman's visions and goals	7-9
02\	AMMAN'S PAST ADAPTIVE PATHWAY Profile of Amman Timeline of experience with UR before 100 RC	10-17
03\	AMMAN'S PRESENT RESILIENCE TODAY Amman Resilience Strategy 2017 Plans and projects 2017-2022 Time of experience with UR after 100RC	18-26
04\	CONCLUSION AMMAN'S RESILIENCE – JUST A PIPE DREAM?	27-28
05\	BIBLIOGRAPHY	29-32
06\	LIST OF FIGURES	33

LIST OF ABBREVIATIONS

100 RC	100 Resilient Cities
AGCAP	Amman Green City Action Plan
AGGP	Amman Green Growth Plan
BRT	Bus Rapid Transit System
CAP	Climate Change Action Plan
CityRAP	City Resilience Action Planning Tool
EBRD	European Bank for Reconstruction and Development
GAM	Greater Amman Municipality
GBC	Green Building Codes
JSP	Japan Supplementary Fund
SDG	Sustainable Development Goal
TMMP	Transportation & Mobility Masterplan
UR	Urban Resilience

INTRO

AMMAN

Located in the north-west corner of Jordan, surrounded by the Middle East's other urban centres including Damascus, Beirut and Jerusalem, Amman is one of the great geopolitical hubs of the Arab world. First urbanised in the latter part of the second millennium by the ancient Ammonites, Amman now spans a total area of 1,680 square kilometres, and was initially built on seven hills, or *jabals* in Arabic (Dumper and Stanley, 2007). Each hill more or less indicates a neighbourhood and contains a traffic circle. Along with the recently developed eighth circle, the hills form the spine of the city and offer the basis of navigation from one end to the other. As it goes, the first circle, or hill, is the oldest and therefore denotes the oldest modern infrastructure, and the further up in number one goes, the newer the surrounding development.

One of the oldest cities in the world – excavation works have discovered homes likely built around 7000 BC – Amman (and Jordan in general) has been conquered by empires such as the Assyrians, Neo-Babylonians, Persians, as well as the Romans, Ottomans and British. The city's nuanced history is therefore marked by centuries of developmental ebbs and flows. While political leaders have long rendered Amman a strategic location thanks to its vicinity to Iraq, Egypt and Syria, it has been abandoned time and time again due its lack of resources, as well as the changing geopolitical contexts. Yet, its history tells one constant tale: that of a city that has always been hospitable towards political refugees and climate-driven nomads (Ministry of Tourism & Antiquities, 2015).

Socio-Economic Context

The Jordanian capital has long been considered a safe haven for the greater region's most vulnerable communities starting with the Arab Bedouins who considered Amman a 'harbour of the desert' in the mid-eighth century, and the Circassians who fled the Russians in the late 19th century (Jaimoukha). Today, Amman's reputation as a home for the displaced continues, as a nexus of Palestinian, Syrian and Iraqi refugees have been migrating to the city since the second half of the 20th century in hopes of escaping the ongoing turmoil in their homelands.

Amman faces long-term challenges, which have maintained continuity throughout millennia and include a lack of resources (particularly energy and water), droughts and heatwaves, as well as more recent shocks and stresses that include population surges, terrorism, poor infrastructure, and an economic crisis accompanied by high unemployment rates. Compounded with climate change, the issues facing Amman create an astonishing pressure on the city's resources, infrastructure and finances, affecting its ability to develop and grow (GAM, 2017).

Amman's spatial boundaries have reached their limits – the relatively small city is currently home to 4,061,150 people, with projections of a 50% increase by 2025 (largely as a result of migration from neighbouring countries) (GAM, 2017). As the population continues to swell, Amman continues to face an increase in youth unemployment (between 15 and 20 percent, mostly affecting those under the age of 40), water scarcity, and a weakening public infrastructure.

Since the city joined Rockefeller's 100 Resilient Cities in 2014, it has aimed to address its increasingly problematic shocks and stresses, while prioritising several leverage points, such as institutional financial planning, urban development, and the implementation of effective legislation. Through a comprehensive urban resilience strategy, Amman aims to become an integrated, smart, environmentally proactive, innovative and equal city (GAM, 2017).



Fig. 3 Jordan on world map

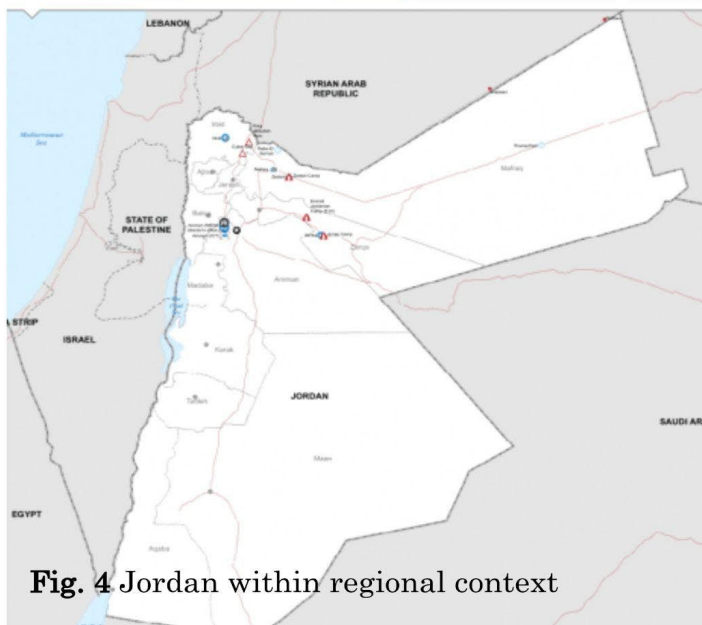


Fig. 4 Jordan within regional context



Fig. 5 Amman in highlight



Fig. 6 Colourful stairs in old Amman

Amman's Visions and Goals

“Our vision is to have Amman [be] a city that is organized, modern, smart, safe, attractive, lively, friendly, viable, [and] proud of its heritage and its roots.” - Eng. Fawzi Masad, Amman’s Chief Resilience Officer 2017



Sustainable

Amman, and Jordan in general, is one of the driest cities in the world with an annual precipitation well below the water poverty line. Amman also imports more than 90 percent of its energy. The city is currently seeking new solutions for resources that are sustainable for the long term.



United and Connected

Between 2005 and 2015, Amman’s population increased by nearly 87 percent due to large influxes of Iraqi and Syrian refugee populations, who, together with Palestinian refugees, now represent more one-third of the kingdom of Jordan. Amman faces challenges of integrating communities and creating equal opportunities.



Innovative

Facing a long-winded economic crisis and rising unemployment rates, Amman is at a turning point in its history where it must find new ways of supporting and empowering its youth. Diversifying its economy, creating new opportunities and investing in human capital needs to be a part of its future.

AMMAN'S PAST AN ADAPTIVE PATHWAY

Prior to becoming a member of Rockefeller's 100 Resilient Cities, Amman had been seeking and implementing resilience strategies since Jordan's independence in 1946. With its vulnerabilities remaining much the same for nearly a century, the national government along with the city's municipality have worked towards emboldening Amman's ability to cope with and mitigate the issues that have plagued its urban development and growth.

According to the resilience strategy report issued by the municipality in 2017, Amman's long-term stresses include: water scarcity, lack of natural resources (particularly energy), major influx of refugees and asylum seekers (particularly in 1948, 1967, 1990, 2003 and 2011), low quality services especially in health and education, urbanisation, unemployment, lack of diverse livelihood opportunities, traffic congestion and lack of a robust public transport system. The city's shocks include an economic crisis (which peaked in 2008 and again in the wake of Covid19), terrorism, infrastructure failure, drought, heatwaves, and flash and surface floods (GAM, 2017).

While the shocks and stresses that threaten Amman are numerous, the worst ones (indicated by their severity, longevity and interdependence) are water and energy scarcity, population surges, a weak economy and rising unemployment, as well as flooding and lack of mobility. The municipality and national government have a history of tackling these issues, albeit relatively unsuccessfully, for decades, but such efforts have laid the foundation for a vision forward, serving as the groundwork of the city's resilience strategy developed in 2017 (Masad, 2022).

Below is a brief look at a few of the Amman's greatest vulnerabilities.

Water and Energy Scarcity

Jordan is one of the 10 driest countries in the world, with estimated renewable water resources of 148 m³ per year, well below the water poverty line of 500 m³ per year (Salman, Abu Khalaf, & Moore, 2006). Primarily caused by the arid to semi-arid climate – 80 percent of the country receives an average precipitation of less than 100 mm/year – and by population increases experienced in recent decades as a result of natural growth and refugee intake, Jordan's water deficit is predicted to become even worse in the coming decades (*Water for Life*, 2008).

In addition to little precipitation, Jordan on a whole suffers from lack of water infrastructure, which renders much of the surface and rain water unusable or unrecyclable. And although it contains major water resources, such as the Jordan River and the Yarmouk River, these are shared with Israel and Syria (*Water for Life*, 2008). Finally, while the Disi Water Conveyance Project (opened in 2013 and which supplies water from the non-renewable Disi aquifer on the border of Jordan and Saudi Arabia) releases some pressure on Amman's water provisions, it is a

source of contention between the two countries and is predicted to run out of water within 50 years due to over-extraction (GAMA, 2008).

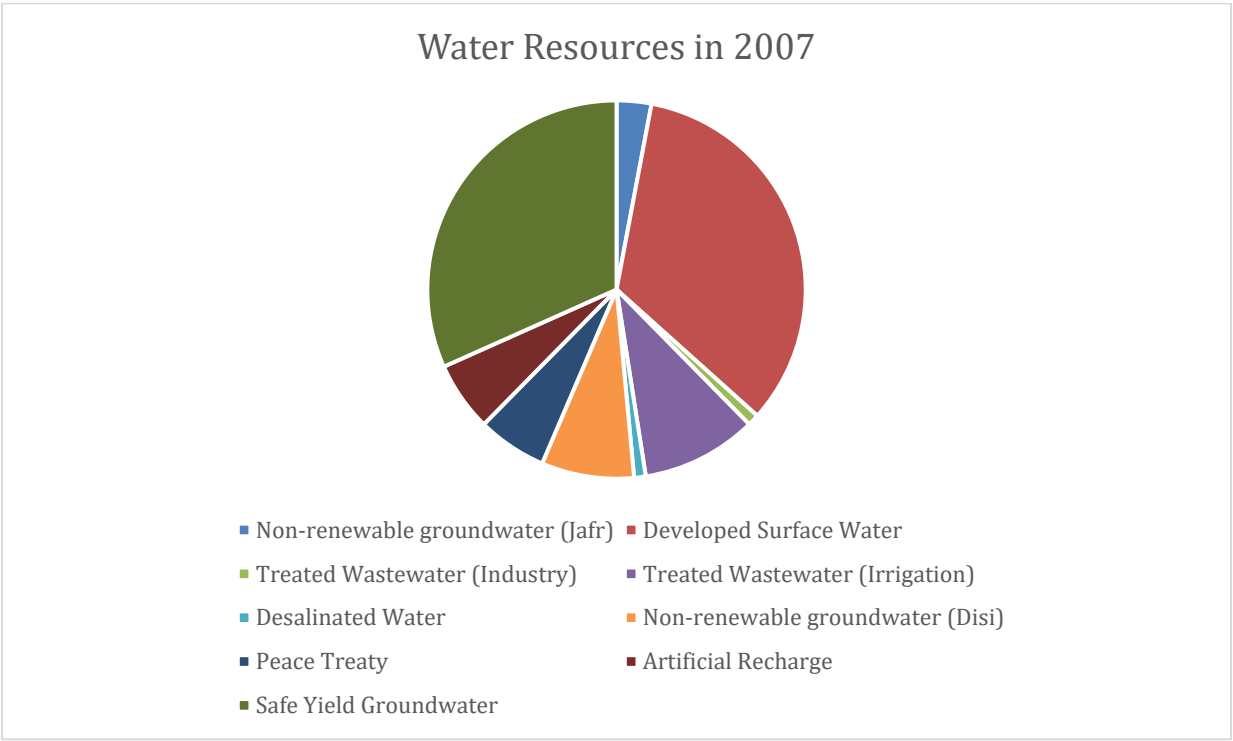


Fig. 7 Amman’s water resources in 2007, from *Water for Life*

In addition, Jordan imports 94 percent of its fossil fuels (oil and gas) to meet its energy needs. This leaves the country vulnerable to fluctuating market prices, and according to reports, the country’s demand for energy is growing at a rate of three percent annually (Abu-Rumman, Khdair, & Khdair, 2020). Amman, and Jordan at large, have worked to integrate solar power technology throughout the city – particularly in the affordable housing market, mosques and schools (*Jordan Times*, 2019).

Population Surges

The population of Amman in the 1920s is estimated to have been between 3,000 and 5,000 inhabitants, with a growth of another 5,000 by 1930 (Naim Ashour, 2016). A British mandate at the time, TransJordan and its capital attracted many from other parts of the country, as well as from the greater region who sought work opportunities.

Two years after its independence, Jordan received hundreds of thousands of refugees from Palestine following the 1948 Arab-Israeli War, and again in 1967 following the Six-Day War (Naim Ashour, 2016). Today, there are more than two million Palestinian refugees in Jordan. Iraqi refugees and asylum seekers first arrived to Jordan after the 1990 Gulf War, and again after the 2003 US-led invasion of Iraq (UNHCR, 2021). According to the UNHCR, as of 2021, there were more than 66,000 registered Iraqi refugees and asylum seekers in Jordan. The remaining major group of refugees residing in Jordan are Syrian, who migrated to the country

after the 2011 civil war. Jordan is currently hosting more than 1.4 million Syrian refugees (Anera, 2019).

In addition to the continuous stream of refugees and asylum seekers from neighbouring countries, Jordan’s population has expanded due to natural growth patterns. While the last population census was completed in 2015, which measured Amman’s population at just over four million people, this equals to just over 40 percent of Jordan’s total population. Therefore, if we take Jordan’s total population from 2021 (10.3 million) and calculate 40 percent, we would get an estimated population of 5.2 million people in Amman today. This indicated a 1.2 million person growth in six years, which is well on the projected path to a total of 6.4 million people in 2025 in Amman (Trading Economics, 2022).

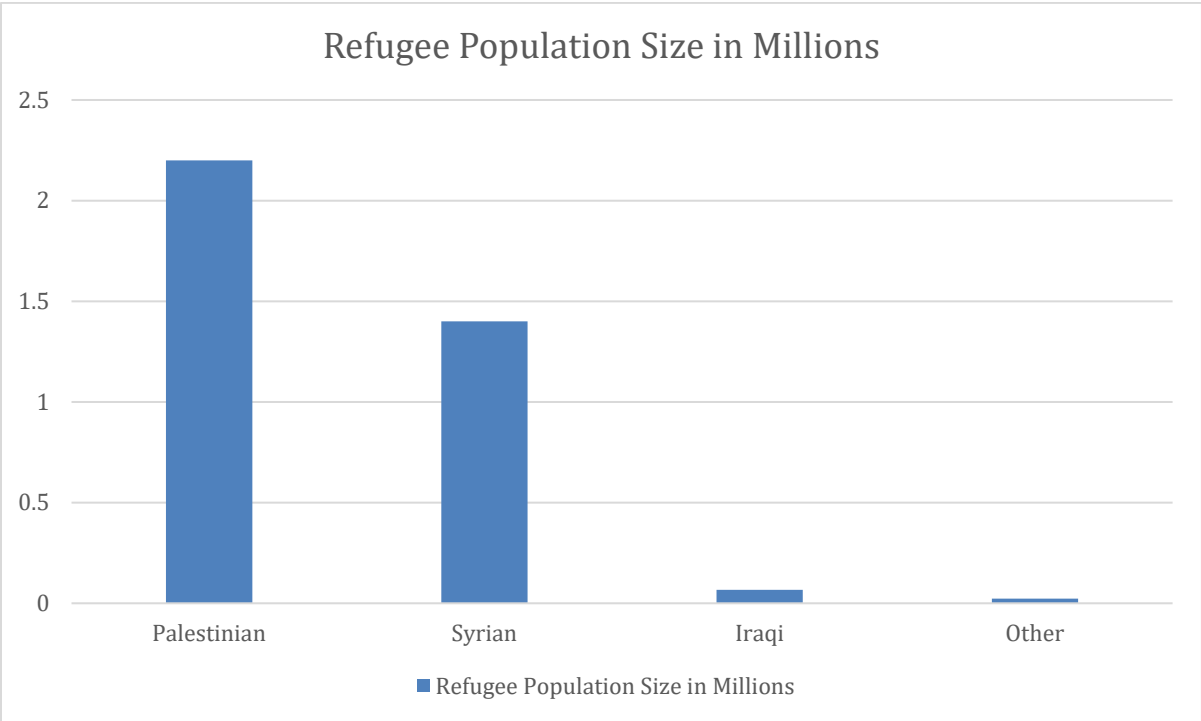


Fig. 8 Jordan's refugee population numbers in 2019

The population surges in Jordan wreak havoc on the existing infrastructure, weak economy and resource scarcity (Gharaibeh, Al Zu’bi, & Abuhassan, 2019). Accommodating large refugee populations requires not only more physical space (of which Jordan is short on), but also more water and energy, job and educational opportunities, healthcare services and more. Being surrounded by politically volatile countries is an incredible vulnerability, especially as current refugee populations maintain a long-term presence (many Palestinians have been in Jordan since 1948 due to Israel’s no right of return policy) and the threat of new waves is almost always imminent.

While Jordan has several formal refugee camps as well as governmental services that aid refugee populations, its resilience strategies have so far aimed at legalising statuses,

implementing sustainability in the camps, and organising vocational and educational workshops and training sessions (Anera, 2019).



Fig. 9 Za'atari Refugee Camp, north of Amman

Economic Crisis and Unemployment

Jordan is one of the best educated countries in the Arab world, with a literacy rate of 93.3% distributed evenly amongst women and men (GAM, 2017). According to *Trading Economics*, unemployment rates peaked at 25 percent in January 2021, although it is currently witnessing a decline (it was reported at 23.3 percent in January 2022) (Trading Economics, 2022). Having long suffered from an internal brain drain – with the city's most educated going abroad for economic opportunity – Amman has attempted to diversify its industries in order to strengthen its job market and improve the national economy. This has mostly been seen in city plans that zone different areas for designated sector uses, as well as in public programmes that aim at supporting youth and migrants.

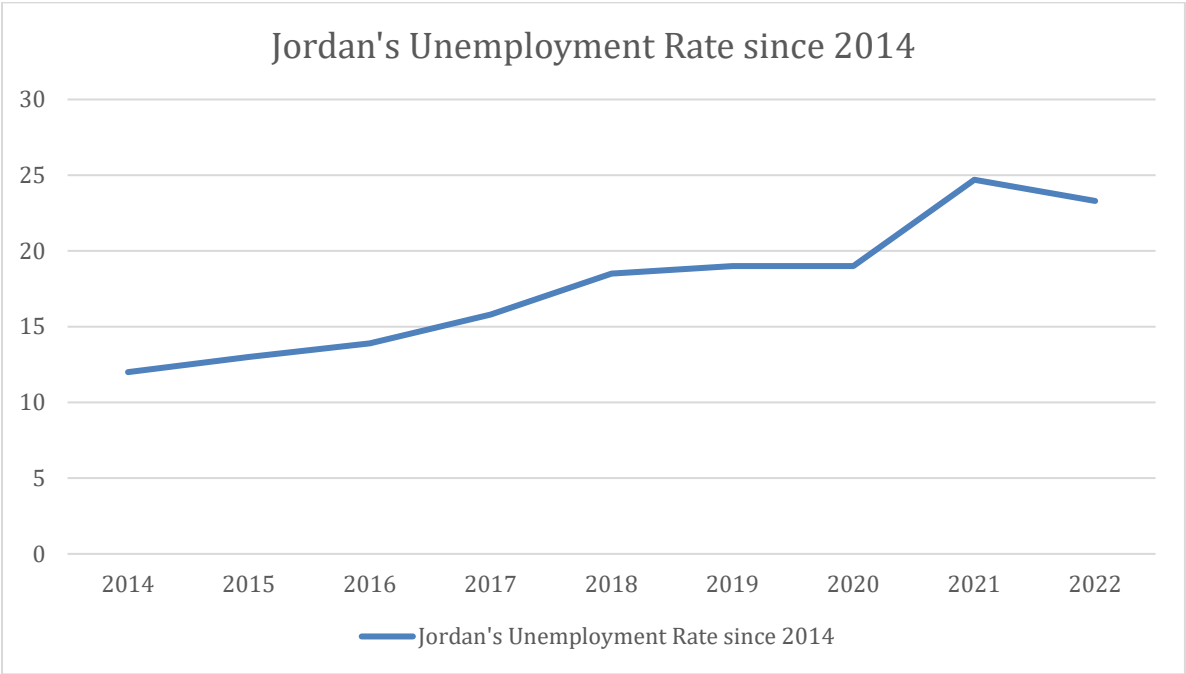


Fig. 10 Jordan's unemployment rate since 2014; Trading Economics

It's important to note that more than half of the population in Amman is under the age of 25; thus, the city has recently begun supporting entrepreneurs and start-ups by investing in its human capital as well as in tech and internet infrastructure. Examples include the Queen Rania Centre for Entrepreneurship (est. 2004), the Young Entrepreneurs Association (est. 1998) and the Business Development Center (est. 2004) (Omet & Bino, 2015).

Despite its efforts, Amman has suffered immensely from the 2008 crisis, surrounding regional conflicts (which not only strained its public services, but impacted its ability to attract foreign investments), as well as the recent Covid19 pandemic, which saw the highest unemployment rate in the city's recent history (GAM, 2020).

Climate Change

Climate-related hazards in Jordan include droughts, flash floods, extreme temperatures and landslides. Although such hazards have occurred periodically throughout the country's history, their intensity and frequency are increasing (World Bank Climate Change Knowledge Portal, 2021).

Because Amman is built on seven hills, it contains seven valleys. Its topography lends to the city's nature of microclimates – while one part of the city can experience snow, another can experience heavy rainfall. The heavy rains in winter cause landslides and flash floods among the wadis in Amman, and the older areas are most vulnerable, with several lives claimed every year due to sudden flooding (ThinkHazard!, 2020).

The city also suffers from increasing temperatures, with droughts increasing in frequency. Since the 1970s, Jordan has suffered from recurrent drought episodes, which have seriously affected the agriculture sector and social development of the country (UNDP, 2019). Droughts have been recorded during the 1970s, 1980s and 1990s, with the worst in recent years occurring between 1999 and 2000 (Salman, Abu Khalaf, & Moore, 2006).

In response, Jordan and Amman have implemented strategies to direct more water to agriculture sectors while also shifting their focus to green and sustainable building practices, evident in the launch of Jordan's Green Building Council in 2009 and the subsequent green building codes in 2013.



Fig. 11 Typical street in Amman.

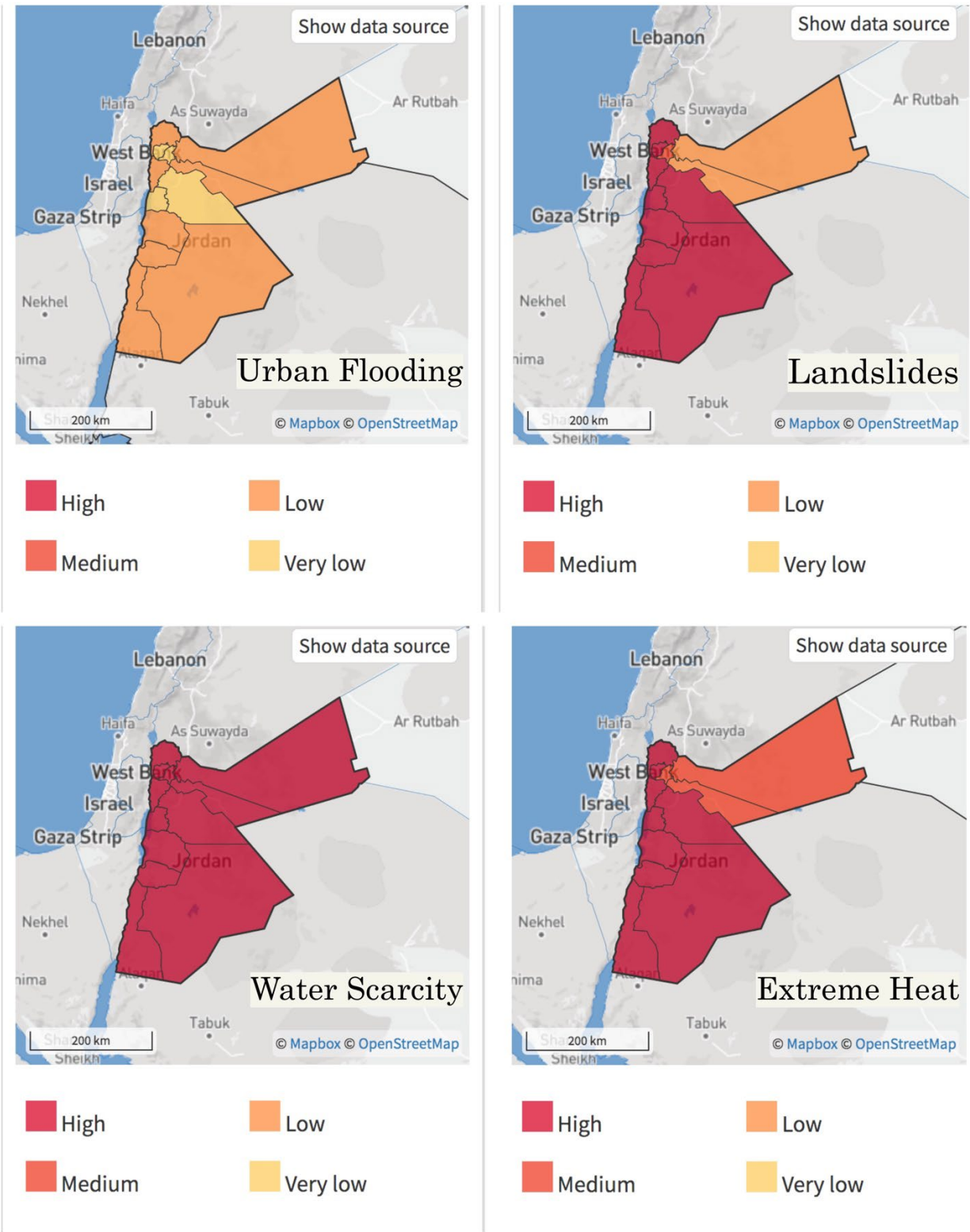


Fig. 12 Data illustrating the climate change risk of different weather conditions as of 2010

SHOCKS AND STRESSES

(As prioritised prior to 100RC)

Stresses:

- Water Scarcity
- Lack of natural resources
- Influx of refugees & asylum seekers
- Urbanisation
- Unemployment
- Lack of affordable housing
- Lack of diverse livelihood opportunities

Shocks:

- Economic crisis
- Terrorism
- Drought
- Heatwaves
- Flash & surface floods

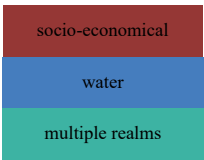
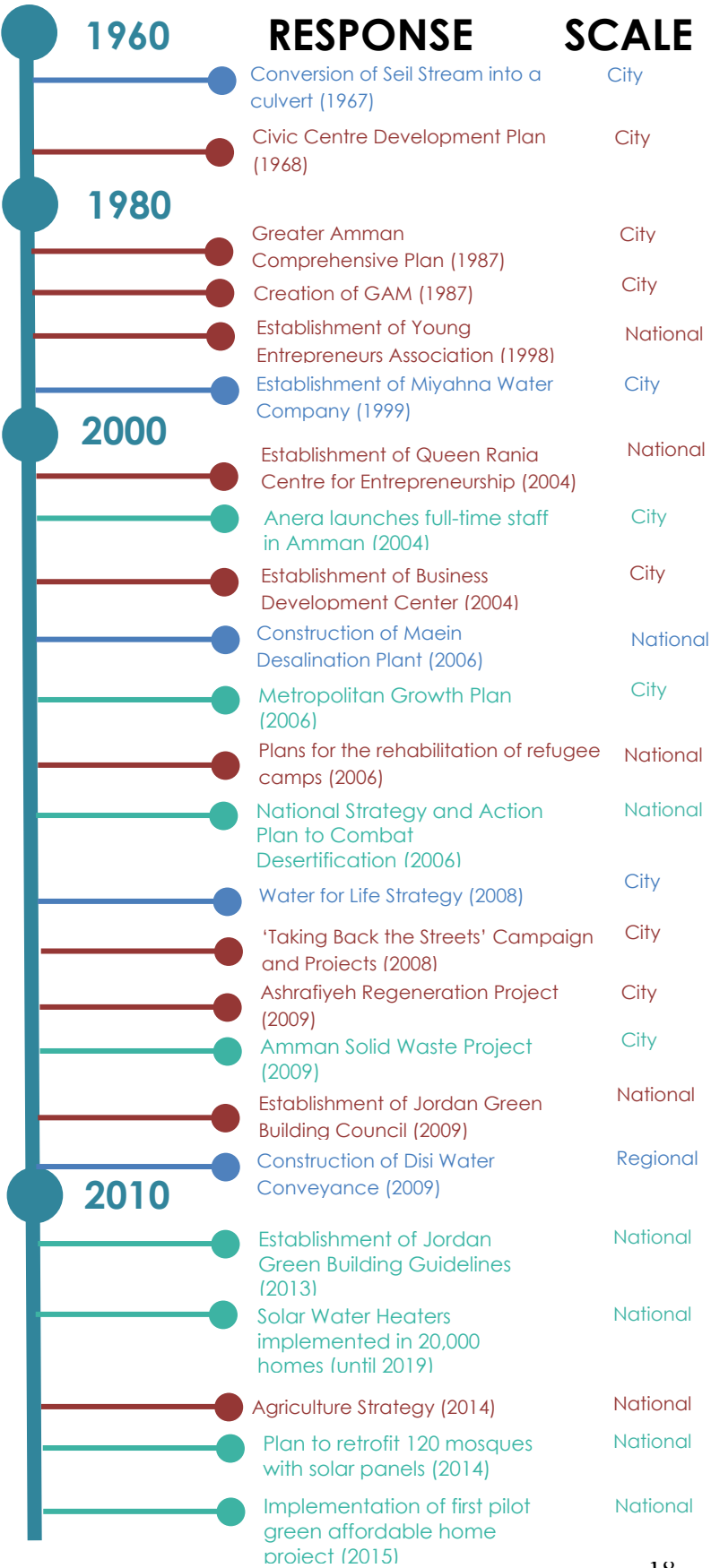


Fig. 13
Experiences with urban resilience before 100 RC



AMMAN'S PRESENT RESILIENCE TODAY

A moderately stable country throughout its development, Jordan's vulnerabilities have remained relatively the same for centuries, but have begun to peak in the last few decades thanks to climate change, global economic crises, and conflicts. With water scarcity its potentially biggest stress, followed by constant population surges due to nearby conflicts, the country – and its capital city Amman – faces a pinnacle moment in its history where sweeping changes must be made to policy, the built environment and public behaviour (GAM, 2017).

The city's resilience strategy, completed in 2017, is a study of the city's challenges and poses a series of appropriate solution areas that tackle all of the above-mentioned vulnerabilities and more. Developed after a series of workshops held between the years 2014 and 2016, which saw the participation of diverse stakeholders including GAM and its departments, private sector actors, NGOs, universities and youth organisations, the Amman Resilience Strategy identifies several leverage points from which a series of pillars or goals are created.

The leverage points outlined in the city's resilience strategy, which correlate with the long-term stresses and shocks that pose ongoing challenges, include:

- Institutional financial planning
- Comprehensive urban development
- Effective legislation
- A robust community
- Amman's ability to cope with sudden increases of population

Considering these leverage points, the strategy is centered around five pillars and presents several actions that work towards these goals. The strategy's five pillars are:

- An integrated and smart city
- An environmentally proactive city
- An innovative and prosperous city
- A young and equal city
- A united and proud city

These pillars, and the resilience strategy in general, offer a near-complete picture of the challenges Amman faces along with general solutions that could steer the city in overcoming them. The pillars prioritise economic growth, community development and urbanisation in the hopes of creating a more resilient Amman for the residents of the city. Notably, the document lacks an effective analysis of gender inequality throughout, as well as the inclusion of refugees or persons with disabilities in the pillars' actions. Nonetheless, the strategy is clear and concise in the suggested routes forward and addresses not only the challenges that have long burdened Amman, but also how the city should develop to excel in the 21st century. It also indicates pathways for implementation, potential partners, and funding sources. However, the document lacks an outline for a monitoring and review process.

The below diagrams illustrate and give an overview of the pillars, along with their relevant Sustainable Development Goals (SDGs) and actions.

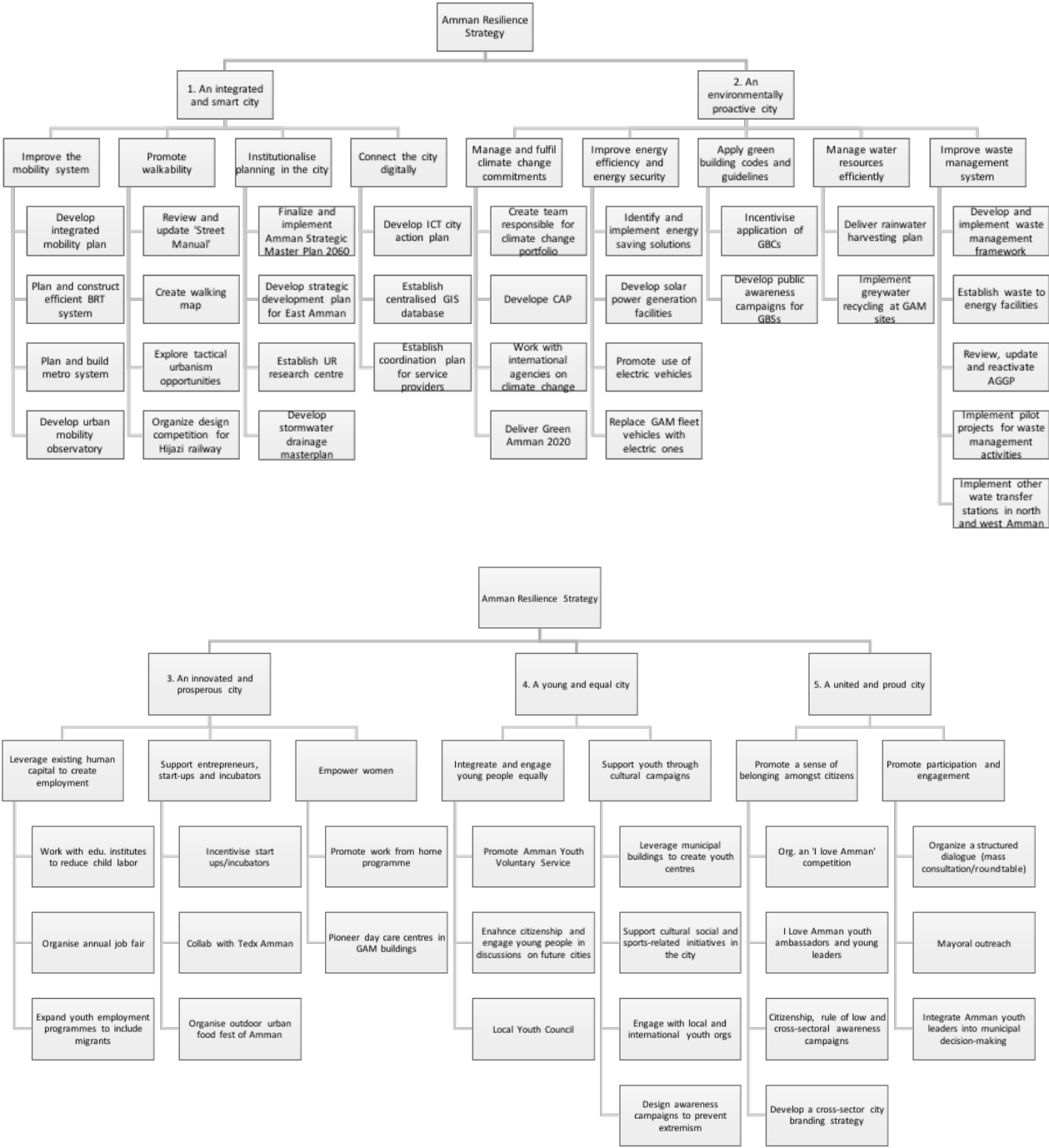


Fig. 14-15 Charts outlining the five pillars and their relevant actions of Amman's resilience strategy

Following the release of the resilience strategy, a plethora of plans and policies were announced in the years since, illustrating the strategy's impact on governmental, academic and public awareness. The plans that follow applied the concept of resilience, either directly or indirectly, which is a distinguishing factor from the plans and policies that predated the resilience strategy. Below are a few plans, policies and projects that illustrate Amman's shift in thinking towards strengthening its capacity to cope with current and future challenges.

An Integrated and Smart City				
Smart Amman 2019				
Description	Developed in partnership between GAM and CDM Smith, Smart Amman is a ‘comprehensive Smart City strategy’ that applies the latest technology in AI and big data innovation to ‘solve the city’s urban planning needs’. The goal of the plan is to afford Amman’s residents and visitors with better access to transportation systems, as well as improve the city’s multi-modality. The 10-year plan is a roadmap of sorts to serve as a long-term reference for the implementation of Smart City programmes, services and infrastructure investments. The plan includes a traffic monitoring platform and an integrated data platform to better assist GAM in data collection, solution making, design and implementation of future transportation measures.			
Resilience of What for What?	Resilience as a metaphor or specific tool?	Credibility	1. Long or short term 2. Scale 3. Horizontal or Vertical	Does it consider gender issues?
Resilience via creating a more robust urban transportation network that uses smart technology to enhance accessibility, connectivity and diversity of transport options.	Resilience as a specific tool to enhance the transportation system of the city.	This plan is meant as a ‘roadmap’. Implementation is yet to be seen. Although, the plan provides information on how to access the necessary funds (potential partners, loan structures, etc)	1. The plan provides short, medium and long-term actions and investment opportunities 2. City 3. Top-down	There is minimal mention of gender issues, but does mention the importance of focusing on women, the elderly and physically disabled.
Evaluation of addressing root causes of threats	Plan assesses the mobility challenges facing Amman’s transportation networks (traffic, lack of public transport, parking), and focuses on specific urban areas that suffer greatly from lack of connectivity and accessibility. Addresses these causes via the use of smart technology.			

An Environmentally Proactive City				
Greening the Camps – Urban Farming in Amman 2017				
Description	Greening the Camps is a non-profit organization established in 2017 that designs, develops, builds and maintains rooftop gardens in Palestinian refugee camps. The pilot project was in Amman, featuring an ‘experimental farm’ hosted on the rooftop of ‘Jadal for Knowledge and Culture’. The group’s process is multi-layered, and aims at reconnecting displaced communities with food production from urban agricultural practices. It also creates opportunities for local empowerment and economic development by employing the people who live in the camps.			
Resilience of What for What?	Resilience as a metaphor or specific tool?	Credibility	1. Long or short term 2. Scale 3. Horizontal or Vertical	Does it consider gender issues?
Sustainable food resilience for refugees	A specific tool to prevent food scarcity in refugee camps	Greening the Camps has implemented its urban agricultural practices in one camp – Jerash	1. Short term 2. Local 3. Bottom-up nature	Not directly, but they employ women

Evaluation of addressing root causes of threats	Greening the Camps has a specific focus on food scarcity and green spaces within refugee camps. It does not really address the root cause of climate change in Amman on a large scale, but rather works to mitigate its impact in micro-scenarios.			
GIZ Green Infrastructure Project 2017-2022				
Description	The Green Infrastructure Project, launched by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), aims to employ residents of East Amman (more vulnerable area due to the age of buildings, socio-economic context and lack of maintenance) in the construction of green public infrastructure. The project is in partnership with the Jordanian Ministry of the Environment and GAM, and includes construction measures that aim to improve residents’ quality of life by facilitating access to local public transport, increasing walkability and preserving biodiversity. These include picnic areas, parks, playgrounds and sports facilities. Residents are involved in the planning and designing of the projects, and are encouraged to take into consideration gender-specific aspects in areas of interaction. Most of those employed are vulnerable Jordanians and Syrian refugees.			
Resilience of What for What?	Resilience as a metaphor or specific tool?	Credibility	1. Long or short term 2. Scale 3. Horizontal or Vertical	Does it consider gender issues?
Community, economic and public space resilience for vulnerable Jordanians and Syrians living in East Amman	A specific tool to mitigate the negative impacts of the city’s rapid urban development	So far, only one project has been implemented – a public space and park.	1. Short-term 2. Local (east Amman) 3. Bottom-up	Yes
Evaluation of addressing root causes of threats	This project does not particularly address the root cause of East Amman’s vulnerability (rapid urban development of surrounding city and lack of municipal management); but rather, it attempts at enhancing the green urban infrastructure and provides temporary economic relief of residents of different backgrounds.			
Jordan National Natural Disaster Risk Reduction Strategy 2019-2022				
Description	This strategy is a road map for policy makers and the general public to form a common understanding of the prevalent disaster risk reduction sector and its capacities, as tailored to the Jordanian context. It is guided by Jordan’s development priorities and aims specifically at achieving a set of objectives that include setting basic disaster risk reduction, increasing awareness and knowledge of disaster risk reduction approaches and opportunities, establishing legal and institutional bases for effective planning and implementation of disaster risk reduction, and contributing to the inclusion of disaster risk reduction in development policies, programmes and projects.			
Resilience of What for What?	Resilience as a metaphor or specific tool?	Credibility	1. Long or short term 2. Scale 3. Horizontal or Vertical	Does it consider gender issues?
Resilience for Jordan as a whole, not only Amman, through security via strengthened disaster risk capacity.	Resilience as a specific tool to maintain the status quo in light of climate change disasters. Many uses of the term ‘build back better’.	Strategy has a detailed section on implementation, monitoring and funding.	1. Short, medium and long-term actions 2. National 3. Top down (priority is on disaster risk governance)	Yes
Evaluation of addressing root causes of threats	Plan comprehensively addresses the environmental challenges of Jordan as well as the burden of population surges on the landscape. It offers a series of actions that should be taken within its four-year trajectory. Although it is tailored to the Jordanian context, some parts seem overly general, for example, much of the document discuss DRR as a general principle rather than a specific tool to be implemented.			

Amman Climate Plan 2050 2019				
Description	As Amman grows, it needs to balance the demands of said growth, equity and environmental protection. Moving toward sustainable development can help achieve this balance, especially if all entities work together. The Amman Climate Plan 2050 outlines a series of strategies that involve good governance and collaboration as the basis for sustainable urban development. The plan details a series of actions the city must take in order to reduce GHG emissions by approx. 40 percent by 2030. The actions relate to transportation (including the planning and building of the city’s first rapid BTS, as well as improving the roads and pedestrian network), energy efficiency (such as enhancing street lighting efficiency with a light-emitting diode street bulb programme and incentivizing green building), and waste management systems (based on reduction, reuse, recycling and recovery).			
Resilience of What for What?	Resilience as a metaphor or specific tool?	Credibility	1. Long or short term 2. Scale 3. Horizontal or Vertical	Does it consider gender issues?
Resilience in terms of a sustainable city that can combat climate change and be more livable. The plan in particular is for Amman residents and citizens. Lack of written inclusivity of refugees and migrants.	Resilience is used as a metaphor for the overall capacity of the city to combat climate change, and as the formative reasoning behind the plan’s call to action.	Plan provides substantial framework for the collaboration of different stakeholders; has led to some policy implementation (Density Bonus for green buildings and policies regarding solar energy), as well as projects (street lights being replaced by LED bulbs, infrastructure for the BRT)	1. Presents short, medium and long-term actions 2. City, with dependencies on national development 3. Horizontal	Very minimally
Evaluation of addressing root causes of threats	Plan thoroughly analyses core urban issues that impact Amman’s carbon footprint and presents a comprehensive study. The plan analyses the economic, cultural and political causes of climate change threats and presents a very full list of solutions and implementation processes.			
CityRAP Amman 2021				
Description	UN-Habitat kicked off the implementation of the participatory City Resilience Action Planning tool (CityRAP) in Amman, and modified it to specifically address the issue of flashfloods in downtown Amman. The workshop included interactive sessions to introduce participants to the concepts of urban resilience and disaster risk management, discuss the issues and challenges in the city and suggest potential solutions. There were 40 attendees and participation from relevant departments at GAM, youth, women, persons with disabilities, Municipal Council of Children, Syrian refugees and local community reps.			
Resilience of What for What?	Resilience as a metaphor or specific tool?	Credibility	1. Long or short term 2. Scale 3. Horizontal or Vertical	Does it consider gender issues?
Resilience in terms of strengthening the capacities of the government and community and of reducing the vulnerabilities of refugees by managing flood disasters better.	Resilience is used as a specific tool in terms of building capacity to deal with emergency flooding.	Funded by the Japan Supplementary Fund (JSP) and implemented by UN-Habitat’s Regional Office for the Arab States.	1. Short term implementation of the collaboration, with long-term solutions likely to have been decided on. 2. City 3. Horizontal (all different actors involved in the workshop)	Yes, there is mention of women and children being of priority.
Evaluation of addressing root causes of threats	Project systematically analyses the weaknesses in Amman’s emergency protocols when it comes to flooding and presents ways to strengthen not only the government’s responses, but also the community’s.			

Amman Green City Action Plan 2021				
Description	The plan highlights six 'green city' actions for the city of Amman and builds on the research of previous green plans released by the capital's municipality. The six actions include: enhancing the efficiency and resilient energy systems and buildings; creating accessible, diverse and low-carbon mobility systems; building resource efficient and holistic waste management systems; integrating water resources management; improving the land-use planning to be more comprehensive and reflective; instilling responsive and forward-looking climate adaptation practices.			
Resilience of What for What?	Resilience as a metaphor or specific tool?	Credibility	1. Long or short term 2. Scale 3. Horizontal or Vertical	Does it consider gender issues?
The plan builds on previous green Amman plans – resilience for the citizens and residents to live in a hospitable city that can overcome and mitigate challenges of climate change. Has more consideration of refugees and refugee camps (air quality for example)	Resilience as a metaphor to strengthen city's adaptation and to mitigate capacity towards climate change.	Presents a MERL process and implementation measures. Plan also identifies finance institutions and partners (international and regional banks/investment authorities) that can be involved in the realization of the plan's actions.	1. 37 short-term actions + 27 long-term actions 2. National (discusses regions that border Amman but are outside of its boundaries) 3. Horizontal	No
Evaluation of addressing root causes of threats	Plan thoroughly analyses core urban issues that impact Amman's carbon footprint and presents a comprehensive study. The plan analyses the economic, cultural and political causes of climate change threats and presents a very full list of solutions and implementation processes.			

A Young and Equal city				
Heart of Amman 2019				
Description	The project aimed at promoting economic opportunities for sustainable livelihoods through micro urban revitalisations in downtown Amman. Run by UNDP, the project uses development as a tool for economic advancement as well as an expression of the city and aims to produce three outputs: equal access to income-generating opportunities for vulnerable youth, women and Syrian refugees; an enabled eco-system for entrepreneurship and innovation development for young men and women; and capacity building for sub-national authorities to strengthen the city's socio-economic resilience. The programme included two main pillars. The first pillar involves youth proposals for entrepreneurial projects. A specialised committee then reviews the proposals and selects 25-30 of them to receive training and startup loans. The second pillar involves vocational training for youth. Those who receive the training are matched with employment opportunities across sectors.			
Resilience of What for What?	Resilience as a metaphor or specific tool?	Credibility	1. Long or short term 2. Scale 3. Horizontal or Vertical	Does it consider gender issues?
Socio-economic resilience for women, vulnerable youth and Syrian refugees.	Resilience as a metaphor for inclusive growth and sustainable livelihoods	Has been implemented with the help of financially aiding partners such as the government of Japan and the National Microfinance Bank.	1. Short-term 2. City 3. Bottom-up	Yes, it has a specific focus on women and youth from vulnerable communities.
Evaluation of addressing root causes of threats	The plan analyses the weaknesses of the Jordanian economy and its lack of diverse, 'high-quality' opportunities and attempts at empowering Jordanian youth (under the age of 40), which makes up almost 70 percent of the population in Amman, by enhancing their skillsets, holding workshops and setting up job fairs.			

National Entrepreneurship Platform 2021				
Description	In 2021, the national government endorsed a policy for entrepreneurship that aims at creating a ‘friendly, incubating and stimulating environment for entrepreneurship in the Kingdom’. The plan hopes to support Jordanian entrepreneurs and thereby bolster the national economy and its sustainable development, and reduce poverty and unemployment. The platform includes setting up measurable performance indicators that include the number of ‘upgraded’ jobs, the amount of capital allocated to entrepreneurs, revenues generated, the number of registered new companies and the participation rate of women and vulnerable groups in entrepreneurial projects. The framework involves the government forming a national council for entrepreneurship headed by the minister of digital economy and entrepreneurship. The council will undertake several tasks, including reviewing and updating the public policy for entrepreneurship and the national strategic plan as needed, evaluating the progress made in implementing the national strategic plan, monitoring key performance indicators, and taking corrective action when needed. The office will also be in touch with donor organisations to obtain funds for the projects.			
Resilience of What for What?	Resilience as a metaphor or specific tool?	Credibility	1. Long or short term 2. Scale 3. Horizontal or Vertical	Does it consider gender issues?
Economic resilience for Jordanian residents under the age of 40.	Resilience as a specific tool to overcome economic shocks like an economic crisis.	The platform is being implemented slowly and a council is being formed.	1. Short term implementation with long term impacts 2. National 3. Horizontal	Yes, it specifically addresses empowering female entrepreneurs and those from more vulnerable communities
Evaluation of addressing root causes of threats	The plan considers the long economic issues and challenges that face the Jordanian people – particularly the youth – and has tried to devise a plan that enables a more diverse job market by empowering Jordanians to create their own employment and businesses. It also has a ‘work from home’ element, that centres on flexibility and bodes well after the Covid19 pandemic.			

The above plans illustrate a great effort on behalf of the municipality, public and private sectors, and individuals who are working in parallel to one another in the hopes of strengthening the coping capacity of the city of Amman.

However, one massive fallback to most of the plans is the lack of focus and attention given to gender equality, refugee populations and persons with disabilities. There are also few plans and policies geared towards community resilience, but the plans that mention it, encapsulate it into their broader picture rather than provide it with its own platform of importance. Most of the plans that have been announced in the past five years are also geared towards a ‘green Amman’. And while this is of course positive, the city seems to have a disproportionate focus on sustainability via construction and building, and lacks focus on sustainability in other important areas, which are outlined in the resilience strategy and include youth empowerment and community building. This presents several issues that will be discussed in the following chapter.

Before reaching the final chapter, a timeline presenting the different plans and projects from the last five years is illustrated.

SHOCKS AND STRESSES

(As prioritised after 100RC)

Stresses:

- High energy costs
- Water Scarcity
- Lack of natural resources
- Limited access to financial assistance
- Influx of refugees & asylum seekers
- Changing demographics
- Low quality services especially in health and education
- Urbanisation
- Unemployment
- Lack of affordable housing
- Lack of diverse livelihood opportunities

Shocks:

- Economic crisis
- Terrorism
- Drought
- Heatwaves
- Flash & surface floods



*Fig. 16
Experiences with
urban resilience
after 100 RC*

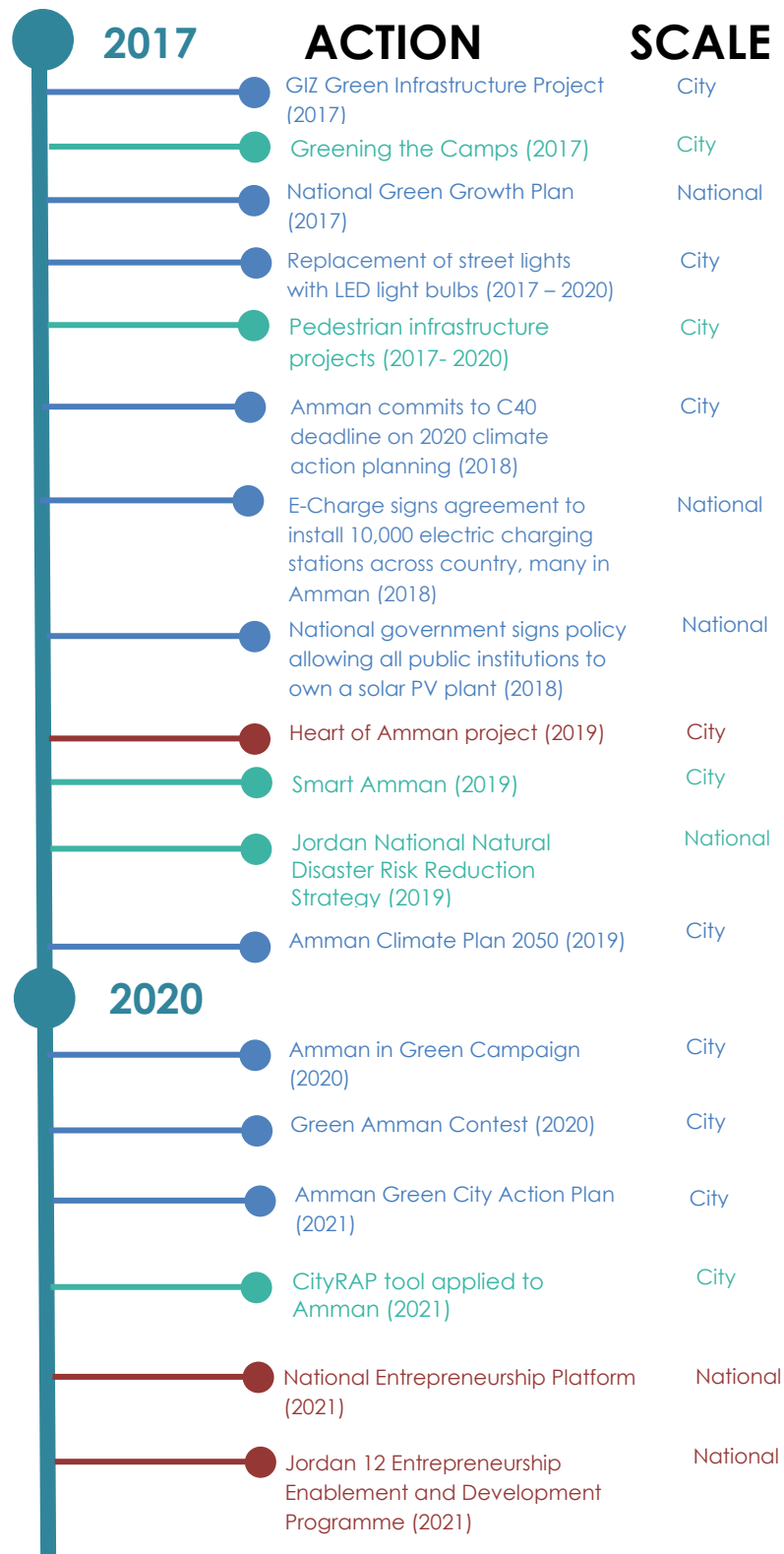




Fig. 17 Urban park by GIZ Green Infrastructure Project, Amman



Fig. 18 Greening the Camps' pilot project

CONCLUSION

AMMAN'S RESILIENCE – JUST A PIPE DREAM?

Amman is a city of plans. Even before its resilience strategy was released in 2017, there had been several plans and papers that called for significant change in the city (and country's) operational structures – from the Transport and Mobility Plan released in 2010 that outlined strategies to improve the city's accessibility and mobility, to the Aligned National Action Plan to Combat Desertification in 2015 that highlighted the causes of land degradation in the kingdom and strategic areas for improvement. Jordan and its capital are aware of the issues that plague their growth, health and development.

It comes then as no surprise that Amman's resilience strategy provides a comprehensive look at the vulnerabilities and challenges of the city and presents a collection of actions that would strengthen its coping capacity, from climate change to the economy to empowering the youth. And it clearly builds on the plans that were developed before it. However, throughout the resilience strategy, robustness is the main resilience quality that the plan aims for, and uses it as a qualifier for end goals far more than other qualities such as flexibility or redundancy. Additionally, in the years since 2017, while there have been plenty of new plans that touch on themes of resilience (highlighted in the previous section), there has been very little implementation of the strategy as well as the following plans. And this begs the question: by calling for more robust systems, infrastructure and networks, did the resilience strategy of 2017 fall short of actual impact? Would transformation of the system (or at least attempts at transformation) have been more resulting?

In a conversation with Engineer Fawzi Masad, the main architect of Amman's resilience strategy, he noted that while the leading ideas of the strategy are noteworthy and should be followed, very little has been implemented and what has been implemented has been on such a small scale that little impact has been made (changing the municipality's vehicles to electric, minimal implementation of solar power, and marginal changes to waste management systems are examples) (Masad, 2022). This includes, for example, the Amman Green City Action Plan, which the municipality has enacted. While the plan states it will incentivise developers and landowners to follow the city's green building codes (released in 2013), the incentives (exemption from certain fees), according to Masad, are not good enough and do not inspire much change. However, there has been some improvement in the support of entrepreneurs and the youth via programmes, training workshops and source funding and this is evident in the national entrepreneurship programmes that tackle issues of diversifying livelihood options and opportunities and support residents of all backgrounds by providing partnerships, skillsets and business know-how (Tawarneh, 2022).

As far as water and energy scarcity, as well as waste management, while the resilience strategy touches on these topics, they don't maintain the primary focus they should and it seems that there has been very few to no actions implemented in the years since in terms of addressing these topics. While GAM is working on improving the capacities of its landfills (Masad mentioned the possible implementation of generating electricity from them), there are very few policies and measures that encourage and enable recycling, improved garbage collection and energy and water saving (Masad, 2022).

It also comes as some surprise to see that while there is discussion of the refugee crisis, it mostly regards their impact on demographic changes and Amman's systems, thereby worsening the challenges and vulnerabilities (such as water, energy and economy) that the city faces. While their impact on Amman's systems should be critically analysed, solutions refrain from directly including them. Much of the work towards community resilience for the most vulnerable (those residing in refugee camps or very poor areas of the city) comes at a very small scale, and features temporary solutions. This includes the Greening the Camps project, which has thus far been able to build green infrastructure for only one camp, and the GIZ Green Infrastructure Project, which aims at enhancing the green public spaces of East Amman. Both involve employing locals and residents to provide economic relief (which is temporary and short-term), and this also likely leads to community ownership and unity among the residents. Lastly, very little is mentioned about gender and those with disabilities, as only a few plans currently published make note of increased vulnerability for certain demographics (highlighted above).

In response to Covid19, there has been mention of a growing 'work from home' shift among entrepreneurs in economic growth plans (National Entrepreneurship Platform, 2021), as well as several studies on the impacts of Covid (Covid-19 Impact on Households in Jordan, 2020; Amman's urban response to Covid-19, 2020), but again, little implementation of solutions and actions that alleviate the challenges of Covid19 have taken place. There also hasn't been any notable mention of Covid19 in economic, sustainability or construction plans that have been released since 2020.

Certain trade-offs arise from the resilience strategy released in 2017, as well as some of the following plans. For example, the strategy calls for the development of East Amman, addressing urban sprawl, controlling growth and identifying new areas for development and investment. This ties in with leveraging foreign businesses interested in supporting the refugee crisis to invest in marginalized neighbourhoods and includes upgrading housing and transportation. While improving the living conditions for the most vulnerable is a step forward, a potential trade off would be gentrification and rising property values, thus forcing the most vulnerable to relocate to even more degraded and disconnected areas. Another trade-off that surfaces deals with the strategy's call for encouraging a city-wide transition from fuel-based automobiles to electric ones. While this is in-line with sustainable development goals, Amman does not yet have the infrastructure needed to support such a high reliance on electricity and this could cause a reverse vulnerability. Lastly, while 'working from home' initiatives are now popular after Covid19, it's likely that it will cause more economic disadvantages for those living in refugee camps or very unsupported areas of the city who are unable to access internet, computers, or other necessary technology.

In general, Amman has its focus on resilience and this is positive particularly as the city faces a plethora of challenges that will likely only increase in frequency (water and energy scarcity, flooding, economic woes and surges of refugee populations) in the coming decades. And while the many plans that are coming out of the city illustrate an academic depth and holistic comprehension of the systemic problems that need transforming, they fall short of significant impact as their suggested solutions and actions are rarely implemented and when they are implemented, it happens at a very slow pace (Masad, 2022). Additionally, the resilience strategy has not been updated in five years and with the city's resilience department being dissolved and 'integrated' into another department at GAM, we must ask the question: is Amman's resilience just a pipe dream?

A case for the argument that it is a pipe dream, and that resilience is used more as a guiding principle of the city can be made. Until actions and strategies are implemented in a timely manner across significant scales then resilience for the city will remain a guiding principle rather than an effective tool.

Bibliography

128 schools get solar panels as part of Royal Initiative. (2019, July 21). Jordan Times.
<https://jordantimes.com/news/local/128-schools-get-solar-panels-part-royal-initiative>

Abu-Rumman, G., Khdair, A. I., & Khdair, S. I. (2020). Current status and future investment potential in renewable energy in Jordan: An overview. *Heliyon*, 6(2), e03346.
<https://doi.org/10.1016/j.heliyon.2020.e03346>

AECOM. (2020). *Amman Green City Action Plan* (pp. 1–194). AECOM.
Prepared for Greater Amman Municipality and European Bank for Reconstruction and Development

Dumper, M., & Stanley, B. E. (2007). *Cities of the Middle East and North Africa : a historical encyclopedia* (pp. 33–35). Abc-Clio. (Original work published 2007)

Farhan, Y., & Ayed, A. (2017). Assessment of Flash-Flood Hazard in Arid Watersheds of Jordan. *Journal of Geographic Information System*, 09(06), 717–751.
<https://doi.org/10.4236/jgis.2017.96045>

GAMA Energy Inc. (2008). *DISI-MUDAWARRA TO AMMAN WATER CONVEYANCE SYSTEM* (pp. 1–198). GAMA Energy Inc.

Gharaibeh, A. A., Al.Zu'bi, E. M., & Abuhassan, L. B. (2019). Amman (City of Waters); Policy, Land Use, and Character Changes. *Land*, 8(12), 195. <https://doi.org/10.3390/land8120195>

Greater Amman Municipality. (2017). *Amman Resilience Strategy* (pp. 1–148). Greater Amman Municipality.

Greater Amman Municipality. (2020). *Amman's Urban Response to Covid-19 & Institutional Performance* (pp. 1–28). Greater Amman Municipality.

Jaimoukha, A. (n.d.). *The Circassians in Jordan*. www.circassianworld.com. Retrieved April 26, 2022, from <https://www.circassianworld.com/new/diaspora/middle-east/1249-the-circassians-in-jordan.pdf>

Jordan Green Building Council. (2017). *Your Guide to Green Building in Jordan Green Building Informative Booklet* (pp. 1–126). Jordan Green Building Council.

Jordan Unemployment Rate | 2005-2020 Data | 2021-2022 Forecast | Calendar | Historical. (2022). Tradingeconomics.com. <https://tradingeconomics.com/jordan/unemployment-rate>

Lahn, G., Grafham, O., & Elsayed Sparr, A. (2016). *Refugees and Energy Resilience in Jordan* (pp. 1–36). Chatham House.

Masad, F. (2022, April 23). *Interview regarding Amman's resilience updates* (R. Alsammarae, Interviewer) [Personal communication].

Naim Ashour, K. (2016). *Urban Regeneration Strategies in Amman's Core: Urban Development and Real Estate Market* (pp. 1–342). Faculty of Spatial Planning at Dortmund Technical University.

Omet, G. S., & Bino, A. S. (2015). Entrepreneurship in Jordan: Regional Analysis and Envisaged Role. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2682897>

Refugees In Jordan - Syrians & Palestinians. (2019). Anera. <https://www.anera.org/where-we-work/jordan/>

Royal Scientific Society, & Friedrich Ebert Stiftung. (n.d.). *Green Building Development in Jordan 2 Green Building Development in Jordan*.

Salman, M., Abu Khalaf, M., & Moore, B. (2006). *Assessment of the water harvesting sector in Jordan* (pp. 1–49). FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS.

Tawarneh, D. (2022, April 20). *Interview regarding Amman's resilience updates* (R. Alsammarae, Interviewer) [Personal communication].

The History of a Land. (2015, September 23). Web.archive.org; Ministry of Tourism & Antiquities. <https://web.archive.org/web/20150923215527/http://www.doa.gov.jo/En/inside.php?src=sublinks&SIID=5024&MIID=8>

ThinkHazard! (2020). *Identify natural hazards in your project area and understand how to reduce their impact - Jordan*. ThinkHazard!

UNDP. (2019). *Jordan National Natural Disaster Risk Redution Strategy* (pp. 1–53). UNDP & National Center for Security & Crises Management.

UNDP. (2020). *COVID-19 Impact on Households in Jordan* (pp. 1–48). UNDP.

UNHCR. (2021). *Registered Persons of Concern Refugees and Asylum Seekers in Jordan* [Infographic].

Water for Life - Jordan's Water Strategy (pp. 1–70). (2008). Jordan Ministry of Water and Irrigation.

World Bank Climate Change Knowledge Portal. (2021). [Climateknowledgeportal.worldbank.org](https://climateknowledgeportal.worldbank.org).
<https://climateknowledgeportal.worldbank.org/country/jordan/vulnerability>

List of figures

Graphics, which are not explicitly mentioned in the list of figures, were created by the author.

Fig. 1

Amman; author's own. December 2018

Fig. 2

Amman; author's own. December 2018

Fig. 3 – 5

Jordan on the world map. Wikimedia Commons

Fig 6

Colourful staircase in Amman; author's own. December 2018

Fig 7

Graph depicting Amman's water resources; Water for Life, 2008

Fig 8

Graph depicting Jordan's refugee populations; Anera, 2019

Fig 9

Za'atari refugee camp outside of Amman; Wikimedia Commons, 2013

Fig 10

Graph depicting Jordan's unemployment rate since 2014; Trading Economics, 2022

Fig 11

Typical street in Amman; author's own. December 2018

Fig 12

Maps illustrating the climate change risk of different weather conditions as of 2019; ThinkHazard! 2020

Fig 13

Timeline of experience with resilience before 100 RC

Fig 14-15

Charts outlining the five pillars of Amman Resilience Strategy; GAM, 2017

Fig 16

Timeline of experience with resilience after 100 RC

Fig 17

Urban Park by GIZ Green Infrastructure Project; GIZ, 2017-2022

Fig 18

Greening the Camps' pilot project in Amman; Greening the Camps, 2017